

APPENDIX B OPTIONS ASSESSMENT

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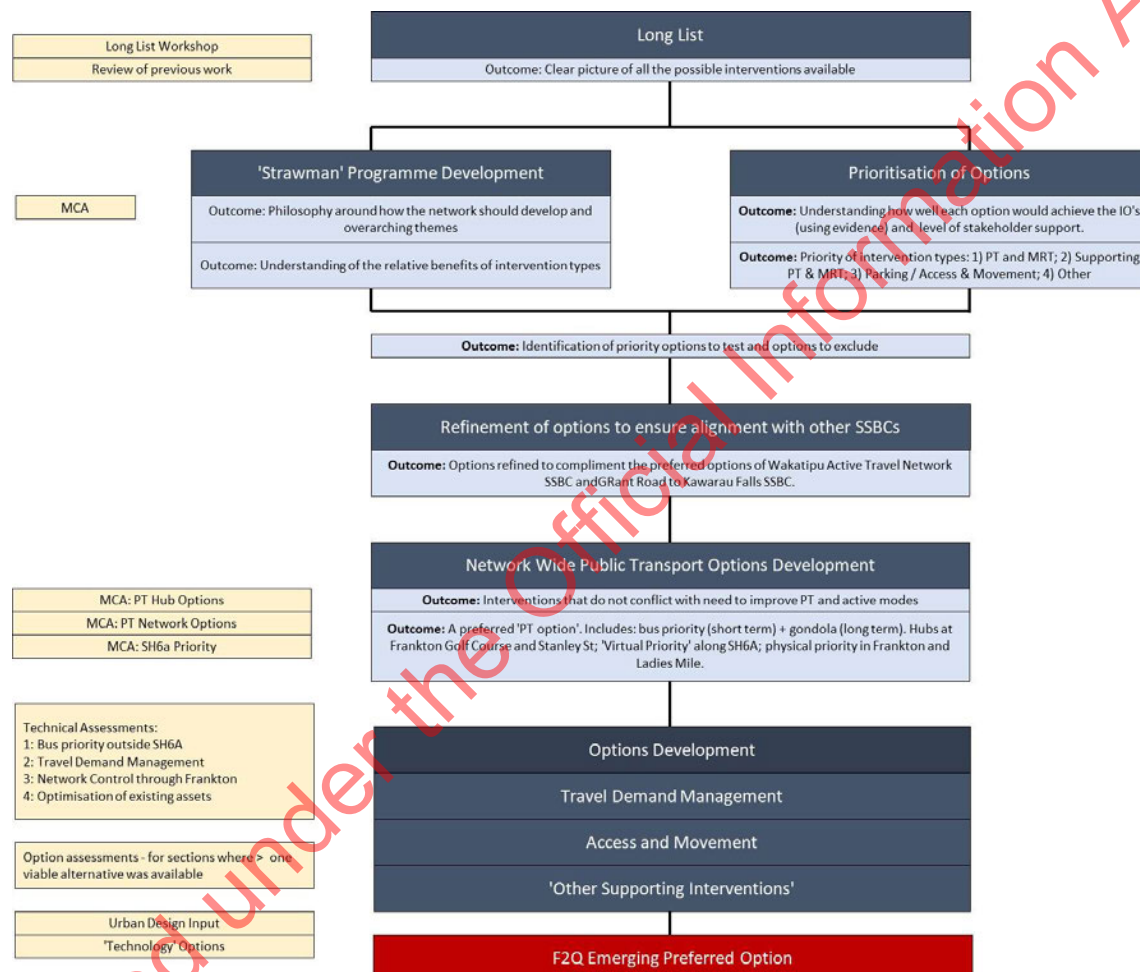
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Options Development Process

Frankton to Queenstown Process

The Frankton to Queenstown component of this business case was developed directly from the QITPBC and therefore requires a greater level of optioneering and analysis of shortlisted options to identify the preferred interventions identified in the PBC. As detailed below, much of the optioneering for Frankton to Queenstown morphed into a network-wide public transport response.

The figure below provides a flow-diagram of how the emerging preferred programme for the network and Frankton to Queenstown was developed.



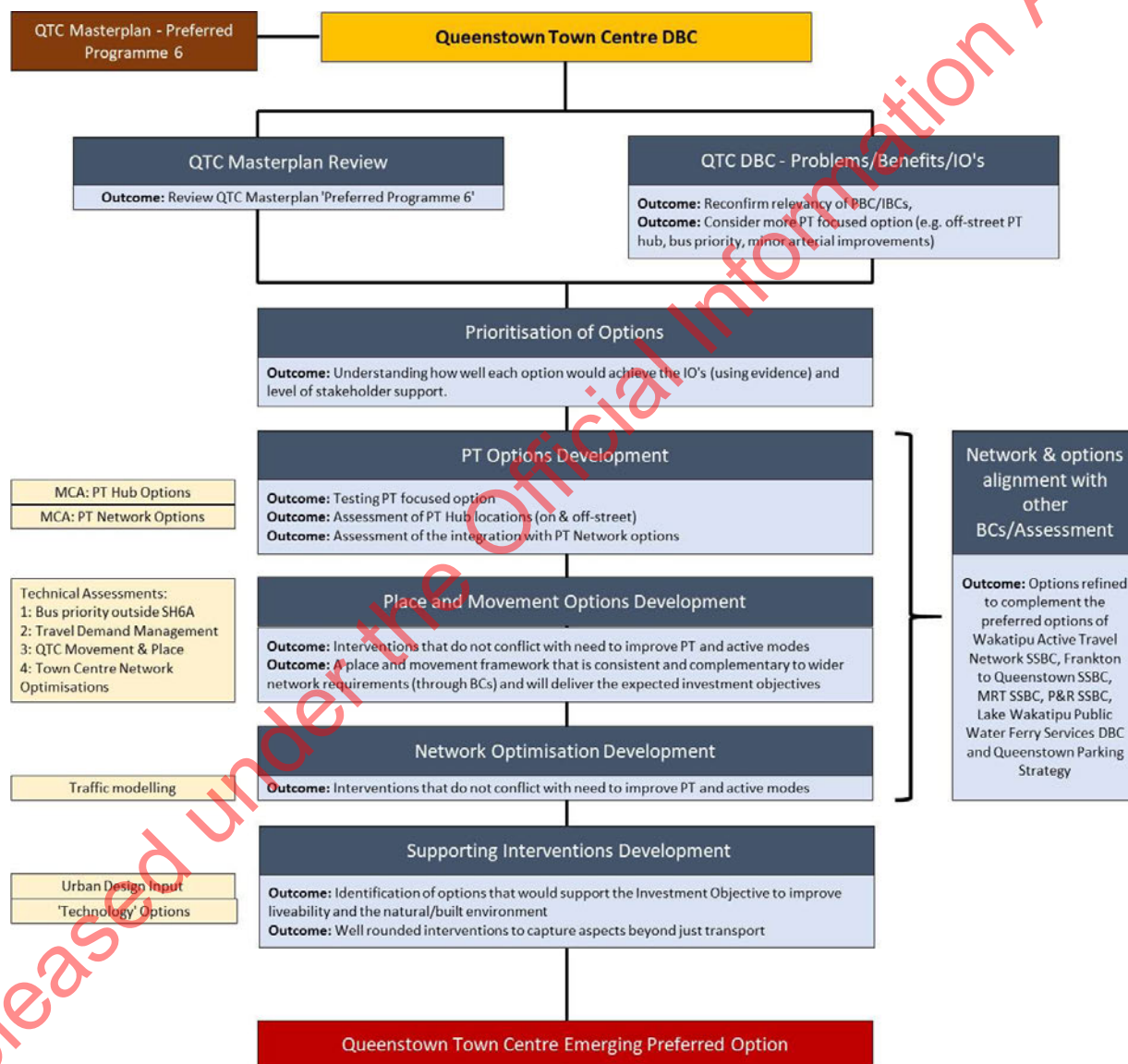
F2Q - Optioneering Process¹

¹ Interventions lower than Priority 1 were not put through an MCA process due to the impractical number of assessments required. Instead, a strategic approach for groups of interventions (such as location-specific intersection treatments) was agreed with stakeholders with resultant concept designs shared for discussion at workshops.

Queenstown Town Centre Process

The Queenstown Town Centre (QTC) component of this business case started from an IBC-level of detail, due to work undertaken previously as part of the Queenstown Town Centre Masterplan PBC. Optioneering built upon a review of previous master plan work, confirming alignment with other relevant projects and adapting, as necessary, as updated information became available.

The figure below provides a flow-diagram of how the emerging preferred programme for the QTC. This process specifically sought to test the Masterplan programme with the core public transport solution focus of this business case.



Queenstown Town Centre - Optioneering Process

Frankton and Ladies Mile Scope Expansion

During the optioneering process for Frankton to Queenstown, it was Identified that additional scope was required to consider options in Frankton and Ladies Mile due to the interdependencies between these study areas (as set out in the Queenstown Business Case strategic case).

This was able to build on work undertaken previously as part of the Grant Road to Kawarau Falls Bridge business case (GR2KFB) and the Ladies Mile ITA.

Emerging preferred options that had been workshopped and consulted on for these two previous projects were brought forward and adapted to align with the investment objectives of this project.

A review of the strategic cases found strong alignment and were directly relevant to this project. QTC was at a slightly different stage but the problem statements and approach to optioneering was generally consistent with the Frankton to Queenstown and Frankton/Ladies Mile sections. Therefore, the various processes were able to be run in parallel.

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Reference	Option
1.0	Do nothing
1.1	Increased (Traffic) Capacity of SH6A
1.1.1	4 laning
1.1.2	3 laning
1.1.3	Double deck
1.1.4	Frankton Arm lake front arterial
1.1.5	Kelvin Peninsula with bridge across to QTC
1.1.6	Kelvin Peninsula with park and ferry to QTC
1.2	Localised Widening
1.3	Bus Priority & Supporting Measures
1.3.1	Bus Lanes
1.3.1.1	At localised widening
1.3.1.2	Suburb St to Franton Rd/Stanley St (Cophthorne)
1.3.1.3	Utilise wide highway reserve between Morries Road and Suburb St
1.3.1.4	Shoulder conversion (peak only)
1.3.1.5	Tidal flow lane
1.3.2	Signal Priority (incl proximity)
1.3.3	Bus Infrastructure Improvements
1.3.3.1	Opposite Morries Road (ref The Club RC)
1.3.3.2	Between Hensman Rd and The Point both sides
1.3.3.3	Bus stop increased capacity for private coaches, NZSki, etc
1.3.4	Real Time Information
1.4	Intersection Improvements
1.4.1	Pedestrian Overpass Marina Heights
1.4.2	Pedestrian Signals Frankton Marina/Z Station
1.4.3	Signalise Marina Drive/Sugar Lane Int
1.4.4	Alternative access for Frankton Marina
1.4.5	Pedestrian Overpass Perkins Rd
1.4.6	Pedestrian Signals Perkins Rd
1.4.7	Signalise Perkins Road Int
1.4.8	Pedestrian Refuge Middleton Rd
1.4.9	Signalise Middleton Rd Int
1.4.10	Pedestrian Signals Battery Hill
1.4.11	Signalise Battery Hill Int
1.4.12	Pedestrian/cycle only grade separation Goldfield Heights Int
1.4.13	Pedestrian Signals Goldfield Heights
1.4.14	Signalise Goldfield Heights Int
1.4.15	Grade separation Goldfield Heights Int
1.4.16	Pedestrian Overpass Larch Hill
1.4.17	Pedestrian Signals Larch Hill
1.4.18	Signalise Larch Hill Place Int
1.4.19	Pedestrian Overpass Andrews /Hensman Rd
1.4.20	Pedestrian Signals Andrews/Hensman Rd
1.4.21	Signalise Andrews/Hensman Rd Int
1.4.22	Pedestrian Overpass Morries Rd
1.4.23	Pedestrian Signals Spinnaker Bay Area
1.4.24	Pedestrian Signals Suburb St
1.4.25	Signalise Suburb St Int
1.4.26	Roundabout Suburb St
1.4.27	Signalise Frankton/Dublin/Melbourne

Network

Reference	Option
Network	1.5 Water Rapid Transit
	1.5.1 Close access for properties below F2Q and access by ferry only
	1.5.2 WRT
	1.5.3 Park & WRT
	1.5.4 Ferry terminals/jetties
	1.5.5 Amphibious Buses
	1.6 Mass Rapid Transit
	1.6.1 Bus rapid transit
	1.6.2 Light rail along SH6A (into Melbourne St terminus)
	1.6.3 Light rail along SH6A and down Coronation Dr to Stanley St terminus
	1.6.4 Frankton Track light rail
	1.6.5 Frankton Track gondola
	1.6.6 Queenstown Hill gondola
	1.6.7 North Shore MRT
	1.6.8 Kelvin Peninsula gondola
	1.6.9 Split level with MRT directly on top of existing SH6A
	1.6.10 Double deck light rail and road
	1.7 ITS/Future Mobility
	1.7.1 Real time travel info
	1.7.2 Real time bus info
	1.7.3 QTC car parking spaces real time info
	1.7.4 Mobility as a Service (MaaS)
	1.7.5 Electric vehicle charging facilities
	1.7.6 Shared mobility
	1.7.7 Automated vehicles
	1.7.8 Connected vehicles
	1.7.9 Flying cars???
	1.7.10 e-bikes/e-scooters
	1.8 Travel Demand Management
	1.8.1 Improved service of existing PT
	1.8.2 Parking strategy/pricing
	1.8.3 Road pricing (toll)
	1.8.4 Rental car levy/toll
	1.8.5 Rental car supply
	1.8.6 Private vehicle road capacity constraints
	1.8.7 PT priority measures
	1.8.8 Improved active travel
	1.8.9 T2/T3 lanes
	1.8.10 Base (variable) pricing on traffic congestion
	1.8.11 Provide bus tickets with accommodation sales, or with arrival documentation/at airport (or ticketless from airport)
	1.8.12 Freight consolidation programme - reduction in movements
	1.9 Misc/QTC Integration
	1.9.1 Upgrade full length of Melbourne St
	1.9.2 Upgrade Melbourne St from Coronation Drive
	1.9.3 One-way pair of streets (Melbourne/Stanley) allows bus priority on Stanley
	1.9.4 Park and ride locations in Frankton (alternative)

Reference	Option
Public Realm & Amenity	2.0 Public Realm & Amenity
	2.1 Do nothing
	2.2 Improve sense of place through route treatment airport to QTC
	2.3 Provide better connections to PT/active travel along corridor
	2.4 Rehabilitation/upgrade of public realms to provide direction
	2.5 Pullover/viewing areas for lake/scenery
	2.6 Bike facilities at bottom of uphill links
	2.7 Widen shared path along SH6a
	2.8 Amenity planting trees along corridor
	2.9 Amenity planting along slope and retaining structures
	2.10 Urban comfort along route including seating, water stations, litter bins, etc
Supporting Measures	3.0 Supporting Measures
	3.1 Active Transport Modes
	3.1.1 Widening, seal and light Frankton Track
	3.1.2 Access improvements to Frankton Track from Queenstown Hill
	3.1.3 Walking/Cycling/Scooter Bridge from Kelvin Heights
	3.1.4 Continuous footpaths on both sides of SH6A
	3.1.5 Shared footpath and cycleway on lakeside of SH6A (with signal crossings to access uphill streets)
	3.1.6 Continuous cycleway along each side of SH6A (non segregated)
	3.1.7 Segregated (protected) cycleways both sides of SH6A
	3.1.8 Segregated (protected) two-way cycleway one side of SH6A

Reference	Option
Network	1.0 Do nothing
	1.1 Upgrade full length of Melbourne St
	1.2 Upgrade Melbourne St from Coronation Drive
	1.3 One-way pair of streets (Melbourne/St Stanley) allows bus priority on Stanley
	1.4 Lake front arterial
	1.5 Tunnel Queenstown Bay to Frankton Road
	1.6 Park and ride locations in Frankton (alternative)
	1.7 Rationalise number of side street entrances to current arterials (particularly into town centre)
	1.8 Left in left out only to improve Stanley Street efficiency
	1.9 Man Street arterial join at Hay Street
	1.10 Create bus stop on private property (keep stanley alignment)
	1.11 Bus route from Stanley Road onto Coronation Drive
	1.12 Keep Camp Street as bus hub, turn Camp and Ballart St to bus only
	1.13 New connection from Beetham/Stanley - Ballarat/Henry in place of Melbourne - Henry arterial
	1.14 Stanley Street signalised intersection optimisation
	1.15 Shotover Street signal optimisation
	1.16 Thompson Street to Fernhill link
	1.17 PT Corridor along Coronation Drive
	1.18 Arterial via Gardens with bridge across to One Mile (bottom of Fernhill)
	1.19 Hallenstein Street - encourage traffic to divert of Stanley from Gorge.
Parking	2.0 Do nothing
	2.1 Enforcement
	2.2 Electronic signage for vacant spaces
	2.3 Variable parking fees based on demand or location
	2.4 Remove parking from key CBD streets
	2.5 Off Street parking facilities
	2.6 Park and ride
	2.7 Cordon pricing to reduce demand
	2.8 Rental car parking levy
	2.9 Parking shared use opportunities
	2.10 Variable time restrictions
	2.11 Create parking precincts
	2.12 Online system showing all parking (including private locations)
	2.13 Repurposing of on-street car parks (temp)
Public & Passenger Transport	3.0 Do nothing
	3.1 New bus hub in CBD
	3.2 Bus stop improvements in residential areas
	3.3 Express services
	3.4 Bus lanes in congested areas
	3.5 Bus only streets in CBD
	3.6 Smaller vehicles, higher frequency, more residential routes
	3.7 Improvements to Camp St bus hub
	3.8 Base (variable) pricing on traffic congestion
	3.9 Provide bus tickets with accommodation sales, or with arrival documentation/at airport (or ticketless from airport)
	3.10 Bus pre-emption at Stanley/Ballarat St (with reconfiguration of lanes)
	3.11 PT app information (already available)
	3.12 Light rail corridor off 6A onto Melbourne St terminating at Council building
	3.13 Hotops Rise into QTC for public transport
	3.14 SH6A Suburb St to Copthorne (Frankton Rd/Stanley St) PT priority
	3.15 Frankton Track for MRT
	3.16 PT link from Kelvin Heights
	3.17 Memorial St/Gorge Rd/Templeton Way block for transport hub
	3.18 Gondola landing location
	3.19 Athol St to Stanley St block for PT hub
Public Realm	4.1 Identification of TC heart and how it should expand
	4.2 Freight consolidation programme - reduction in movements
	4.3 Rehabilitation/upgrade of public realms to provide direction
	4.4 Expand laneways/accessways through buildings to enhance permeability
	4.5 Improve sense of place through gateway treatments
	4.6 Activation of town centre attractions

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Queenstown Business Case Transport Modelling Future Modelling Option Report (FMOR)

Prepared for Waka Kotahi

16 September 2020

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Queenstown Business Case Transport Modelling

Future Model Option Report (FMOR)

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1. Introduction

1.1 Overview

The Stantec / WSP / Abley team have been commissioned to provide a project specific model to inform the range of ongoing business cases in Queenstown and the surrounding area. The Queenstown Transport Model (QTM) model has been calibrated and validated in s-Paramics with a 2018 base year. The model calibration and validation performance is reported in a Local Model Validation Report (LMVR) published in March 2019.

A Future Model Base Case Report (FMBCR) was published in December 2019 and focused on a future modelled year of 2028. The report summarises the processes for preparing the demands from the Queenstown-Lakes Tracks Transportation Model. The report also details the model adjustments made for appropriate and anticipated network operation for private vehicles and public transport.

Subsequent to the publication of the FMBCR the modelling team have added a 2048 model to the QTM, however it is noted that this is only able to be run for some scenarios where there is sufficient mode shift away from private vehicle movement. This is discussed in more detail in this report.

This report summarises the outcomes of the final set of business case modelling option analysis. A total of five scenarios are presented with outputs including intersection performance, general traffic travel times and bus travel times across the network. This report should be read in conjunction with the LMVR and FMBCR reports.

2. Scenarios Modelled

2.1 Overview of scenarios

Seven model scenarios were considered as detailed in Table 2-1. A more comprehensive description of the assumptions contained within each scenario is shown in Appendix B.

Table 2-1 Model scenarios

Scenario		Description
1	Do Minimum (Art 1)	Existing (2020) network plus Arterial Stage 1 and other committed infrastructure reported in Appendix A of Queenstown Lakes District Model 2018 Update: Future Forecasting Report, November 2019. This includes most notably: • Signals at SH6A and Sugar Lane, Goldfield Heights and Hensman • Roundabout at SH6/Howards Drive • SH6/Tuckers Beach Road grade separation (opened recently) • Quail Rise to Hawthorne Drive link • Humphrey Street link with signals at SH6/Humphrey and Humphrey/Lucas • Frankton bus hub • Signals at Brecon/Man, Shotover/Rees, Lake Esplanade/Beach, Melbourne/Dublin/Frankton, Gorge/Henry • Inclusion of Barnes Dance for pedestrians at all signals • Closure of Ballarat Street north of Stanley as part of Project Manawa • Additional roading links as per Lakeview structure plan
2	Do Minimum + Stanley Closed	Scenario 1 plus Stanley Street closed (for bus hub)
3	NZUP + A1	Bus lane on: • Lucas Place to Frankton Hub (northbound) • BP to Hardware Lane (eastbound and westbound) • Howards Drive to Stalker Road (westbound) • Kingston Road (northbound -if required) Signalised all SH6A intersections as per NZUP package plus virtual priority Traffic management in Old Frankton Signals at Frankton Hub (interim) Signalised SH6 intersections at SH6A, Lucas Place, Joe O'Connell Drive, Grant Road, Hawthorne Drive, Humphrey Street. Park and ride at Howards Drive and Boyd Road Roundabout at SH6/Howards Drive intersection SH6 westbound bus lanes Arterial Stage 1 Additional bus stops added throughout the network
4	NZUP + A1 + Stanley Closed	Scenario 3 plus Stanley Street closed (for bus hub)
5	NZUP + Art12	Scenario 3 plus Arterial Stage 1 and 2
6	NZUP + Art12 + Stanley Closed	Scenario 5 plus Stanley Street closed (for bus hub)
7	NZUP + Art123 + Stanley Closed	Scenario 6 plus Arterial Stage 3.

However, only Scenarios 3 to 7 were modelled. Scenarios 1 and 2 had a significantly lower mode share due to the less effective public transport provision (both in terms of infrastructure and service level). Therefore, after 2018, scenario 1 and 2 models were unable to run satisfactorily to completion in the Paramics model, due to locking up both in the Frankton and Queenstown Town Centre.

To inform the wider Business Case, the Tracks strategic model is the source of modelling data for the transport economics assessment of the NZUP package against the do minimum. A 2028 do minimum model has been run with the application of 95% of the full do minimum demand matrix to extract public transport travel time benefits from the model. Given the lower than likely demands the resultant travel times for the do minimum will be conservatively on the low (fast) side. Correspondently, the benefits due to the delivery of the NZUP package will be under-represented.

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3. Overall Modelling Methodology

Figure 3-1 shows the overall modelling methodology that was used to derive traffic demand for the local (Paramics) model at future years.

As a single four stage modelling platform was not available, an iterative routine was established that:

- Firstly, the total trip demand (from the three-stage strategic model) was determined assuming no change in mode share
- This full demand was passed through to the bespoke Public Transport model, which determined the likely mode shift away from vehicle driver to public transport
- The strategic model was re-run with the vehicle driver trips shifted to public transport skimmed off the total matrix
- Lastly, this demand set was cordoned for the Paramics model, and then profiled to be consistent with the base model profiling

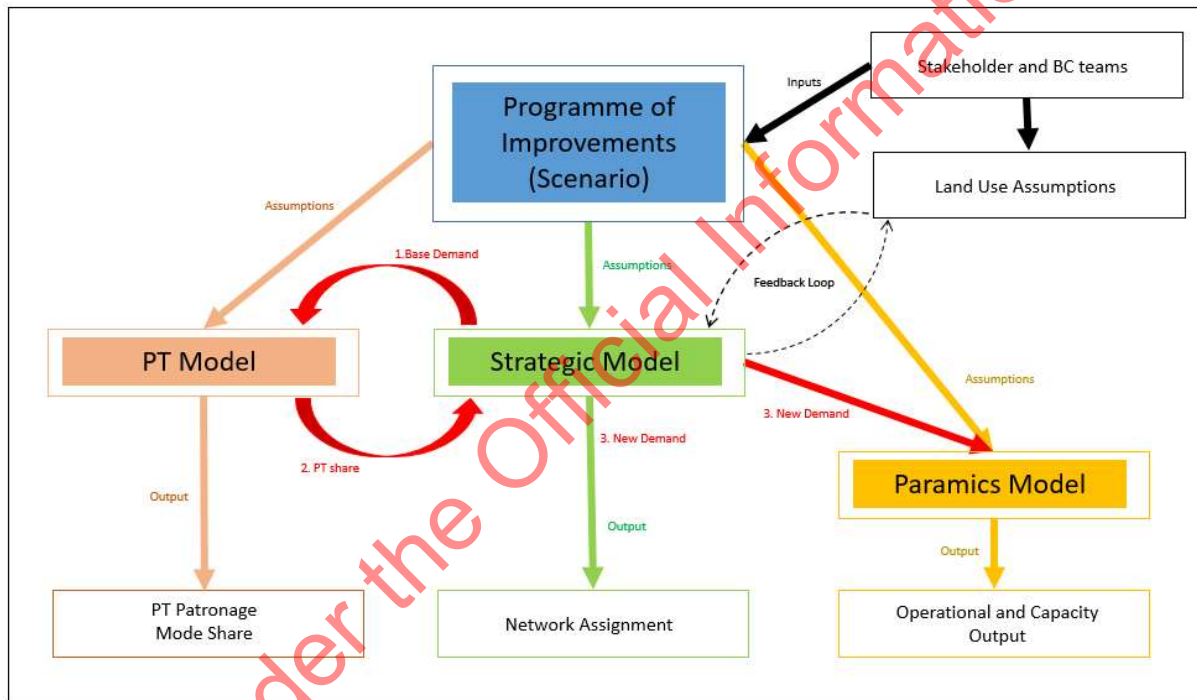


Figure 3-1: Modelling Flowchart

Table 3-1 shows the total demand between the Do Minimum scenario and the NZUP scenario for each period and year. The modelled total demand in the NZUP scenario is lower when compared to the equivalent Do Minimum scenario for each period.

Table 3-1 Total two hour demands (vehicles)

Scenario		AM	IP	PM
2018	Do Min	12902	15924	17435
	NZUP	12448	15165	16947
2028	Do Min	16748	21574	22863
	NZUP	15668	20148	21076
2048	Do Min	19697	26677	28042
	NZUP	18767	25900	26488

4. Model Description

4.1 Geographical Coverage

Figure 4-1 shows (in red) the extent of the model, which covers the Queenstown town centre, Frankton Town Centre and Airport, SH6A and SH6 between Kawarau Falls Bridge up to (but not including) the Stalker Road roundabout on the east side of the Shotover River Bridge.

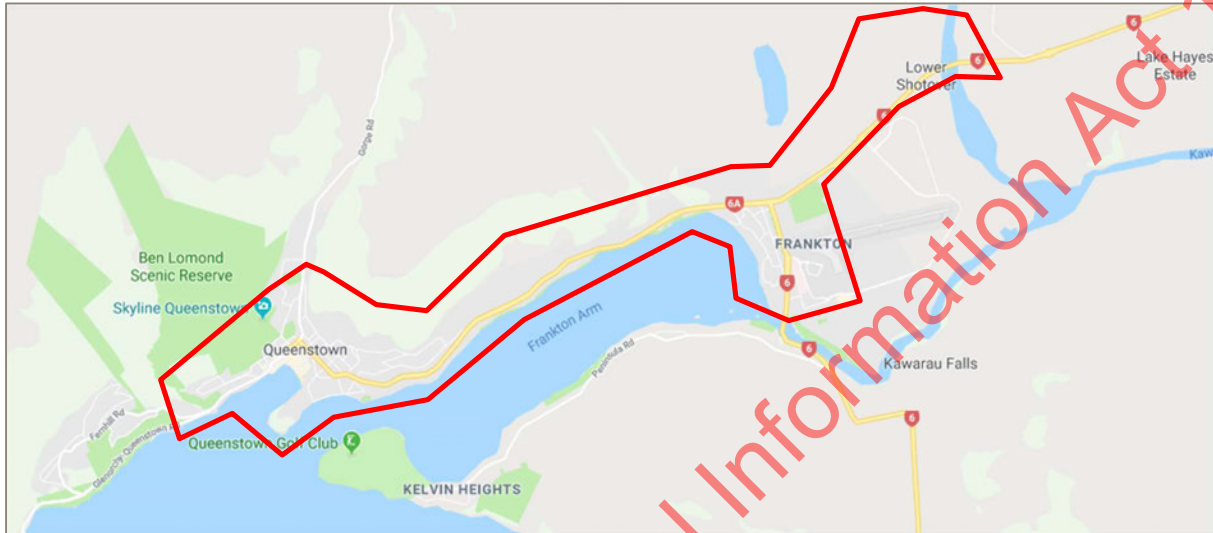


Figure 4-1: Model Extent

4.2 Time Periods

Morning, interpeak and evening peak models have been built, and all day (AADT and AAWT) flows can be calculated using a representative set of traffic count profiles.

Traffic has been calibrated in five-minute time slices for internal and external zones as well as special attractors with unique behaviours (schools, tourist activities etc). A one hour warm up and 30-minute warm down will be included for each period. The evaluation hour for each period will correspond to the strategic model hours of 8-9am, 12-1pm and 5-6pm for morning, interpeak and evening peak models respectively.

4.3 Model Years

4.3.1 Future Years

The agreed future years are 2028 and 2048 in line with the Tracks model. Future demands from the strategic model have significant growth particularly out to 2048, so careful interpretation was required to build up from the 2018 model as the QTM is already near capacity in some locations and can transition into an unstable state. This remains the case with the removal of an increased level of PT demand, as forecast by the bespoke PT model (undertaken by WSP) for the Wakatipu region of the District.

4.4 Mode Choice

As shown in Figure 3-1, the separate Public Transport demand model was used to determine the PT mode share, which was then removed from the strategic model prior to extracted paramics model demands.

4.5 Model Software

The model is built using S-Paramics version 2014.1.

5. Model Outputs

5.1 Level of service (LOS)

This section provides a summary of key intersections' performance for the peak periods for the five model scenarios. The key intersections are:

- Stanley Street/ Shotover Street
- Stanley Street/ Ballarat Street
- Shotover Street/ Camp Street
- Shotover Street/ Rees Street
- Man Street/ Camp Street
- Man Street/ Brecon Street
- Gorge Road/ Hallenstein Street
- Frankton Road/ Hensman Road
- Frankton Road/ Goldfield Heights
- Frankton Road/ Sugar Lane
- Frankton Road/ Marina West Tee
- Frankton Road/ Yewletts Road
- Frankton Road/ McBride Street
- SH6/ SH6A
- SH6/ Joe O'Connell Drive
- SH6/Grant Road
- SH6/Hawthorne Drive
- SH6/Ross Street
- SH6/ Lucas Place
- SH6/ Humphrey Street
- Lucas Place/ Humphrey Street
- Lucas Place/ Hawthorne Drive/ Robertson Street
- Frankton/ Dublin/ Melbourne arterial intersection
- Shotover/ Gorge/ Henry arterial intersection
- Gorge/ Memorial Extension arterial intersection

It should be noted that separate Technical Notes have been produced for grouped sections of the network under study, which provide much greater granular information on both the layout detail, and the subsequent results obtained. Consequently, the output produced by the local model as set out in the following sections should be viewed as a more general comparison of the operation of the network under each scenario.

Additionally, it should also be noted that since this modelling work was undertaken, some capacity improvements have been made to the proposed intersection upgrade at SH6/SH6A, which somewhat relieves congestion at this location, and particularly on the SH6A approach – note, however, it is still expected that forecast queues lengths and high delay are still likely on the two SH6 approaches to this intersection, and therefore the results shown for the Frankton element of the network are still largely representative of the forecast operation (albeit the results are likely to be on the worst-case side).

The key metric reported is the overall Level of Service (LOS) at each key intersection. Typically, in assessments of intersections in peak demand periods the industry best practice is to keep the operation of an intersection at or below LOS D. A general description of level of service is shown in Table 5-1.

Table 5-1 Level of Service (LOS) general description

Level of Service Band	General Traffic Flow Description
LOS A	Primarily free-flow operation
LOS B	Reasonably unimpeded operation
LOS C	Stable operation
LOS D	A less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed
LOS E	Characterised by unstable operation and significant delay
LOS F	Characterised by flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay

5.1.1 Queenstown Town Centre Operation

5.1.1.1 Intersection Level of Service

A comparison of the overall intersection LOS for the key intersections is shown in Figure 5-1 to for the AM peak hour (8am to 9am), Figure 5-2 to for the Interpeak hour (12pm to 1pm) and Figure 5-3 to for the PM peak hour (5pm to 6pm). No LOS summary is reported for the 2048 NZUP + A1 Stanley Closed model scenario because no viable data can be obtained due to the model instability occurring as a result of congestion on the network.

Key points from the intersection LOS comparisons include:

- The Interpeak period is generally the worst case period, due to the relatively low PT mode share in this period. The AM peak period exhibits the least congestion, which is consistent with the existing (2018) conditions on street.
- Overall trends across the three periods (all years) are similar:
 - Gorge/Henry (Stage One Arterial) – this operates at LOS E/F with the completion of Stage One in the morning and interpeak and improves with the inclusion of Stage Two.
 - Gorge/Stage 2 – these signals are introduced as part of the Stage Two works and operate at LOS C/D in future years.
 - Shotover/Stanley – as would be expected, in the scenarios where Stanley Street is closed to traffic, there is an improvement of the intersection performance, due to less total traffic volumes passing through the intersection.
 - Shotover/Camp and Shotover/Rees – improvement in performance is related to the provision of Stage 3 of the Arterial, as this removes a proportion of traffic from Shotover Street (and Lake Esplanade).
 - Man/Camp – there is a deterioration in LOS when Stage 2 is introduced, as the intersection is converted from a roundabout to a signalised intersection, which introduces a residual delay. Also, there is a clearer deterioration in the operation of this intersection at 2048, related to an uplift in demand around the Lakeview development area. In the Interpeak period, the adjacent Man/Brecon intersection shows LOS F in all scenarios – this is due to delay at the Man/Camp intersection, with queues stretching back to Man/Brecon and beyond.
 - Frankton/Dublin/Melbourne – in all scenarios, the intersection is operating satisfactorily at LOS D or better, showing that inbound queues towards the Town Centre are not being predicted in any scenario or year.



Figure 5-1 Overall intersection LOS summary AM peak hour (Queenstown)

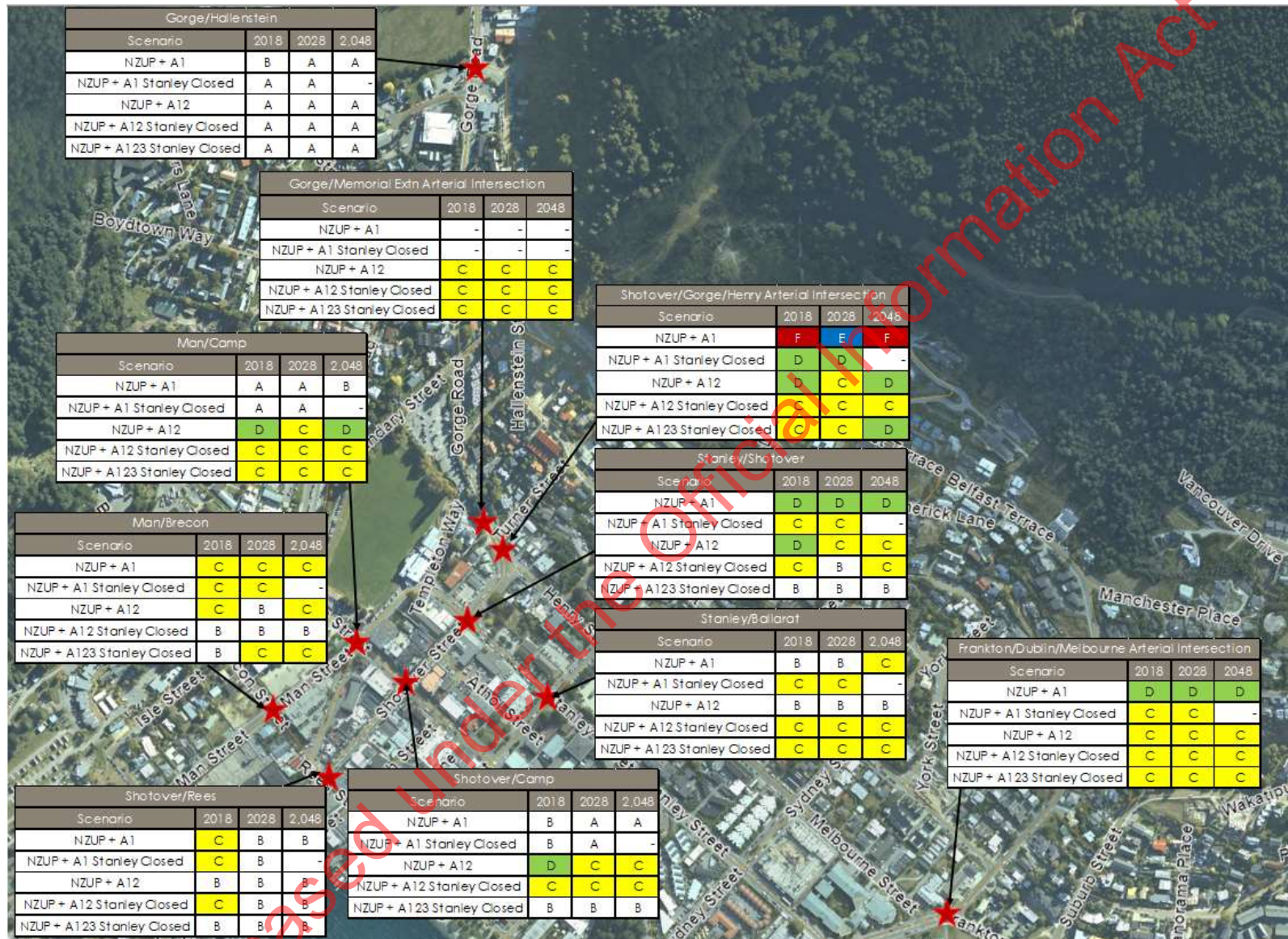




Figure 5-2 Overall intersection LOS summary Interpeak hour (Queenstown)

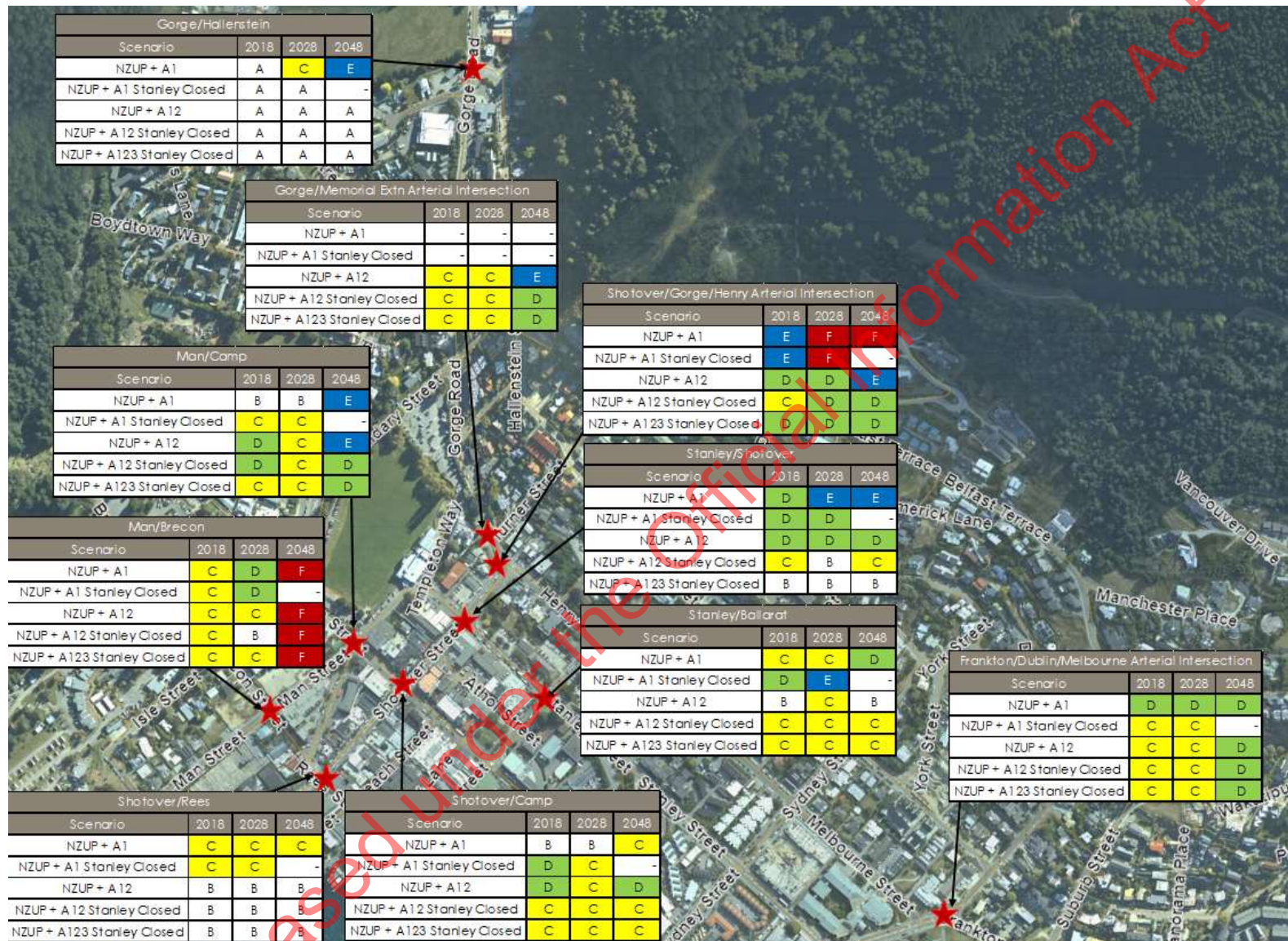
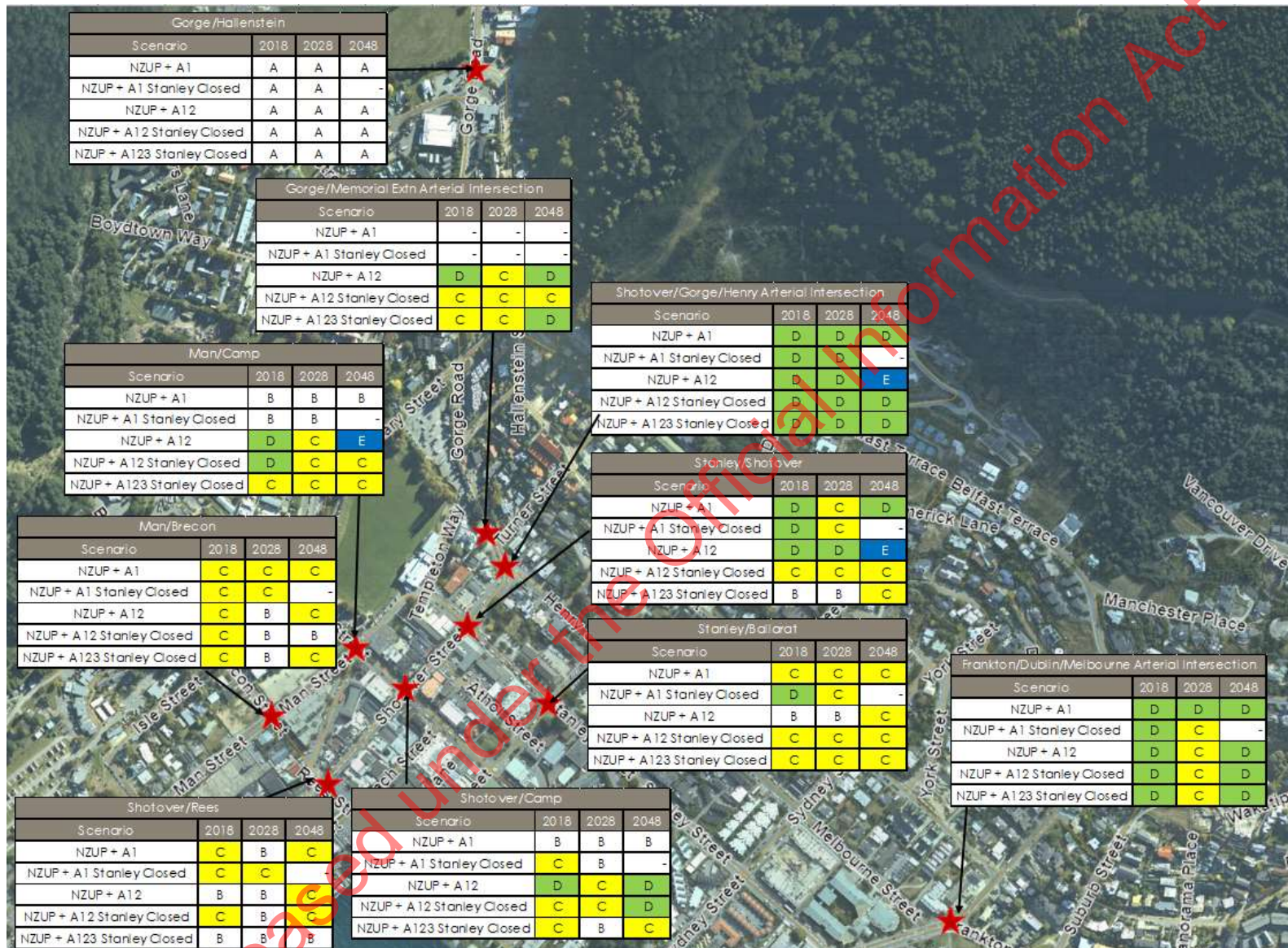




Figure 5-3 Overall intersection LOS summary PM peak hour (Queenstown)



5.1.1.2 Visualisations

Figure 5-4 to Figure 5-8 show visualisations of each of the five scenarios (that is scenarios 3-7) at 12:30 within the 2028 Interpeak period.

The trends are consistent with those set out in the previous section:

- Longer queues are experienced in the NZUP + A1 scenario in Figure 5-4, compared to the subsequent four scenarios. Within this option, the route choice available, between Stanley Street and Melbourne Street/Henry Street results in some variations in route choice, that leads to less predictable turning volumes at the two critical intersections of Stanley/Shotover and Gorge/Henry – and hence some congestion and “flip-flopping” of route choice between the two options. This uncertainty in route choice results in less efficient intersection operation – although this should be weighed against the extra resilience offered by maintaining two possible route options
- Once Arterial Stage 2 is added, there is less difference between the Stanley Street open and closed scenarios (Figure 5-6 and Figure 5-7 respectively) – this is due to the extra capacity added to the network, specifically to remove traffic moving between the west and north ends of the Town Centre, which can use Stage 2 rather than pass through the critical intersections of Gorge/Henry and Stanley/Shotover
- Once Arterial Stage 3 is added, there is a noticeable increase in traffic volumes (and queues) along the Man Street corridor, as traffic is able to divert away from Shotover Street. The balance between these two routes is similar to the choice offered in other scenarios between Stanley Street and Henry Street routes in the east side of the Town Centre, and some dynamic route re-assignment is experienced between the two routes. However, as the volumes are generally less than those on the east side of the Town Centre, this is less sensitive in terms of resulting in poor intersection performance

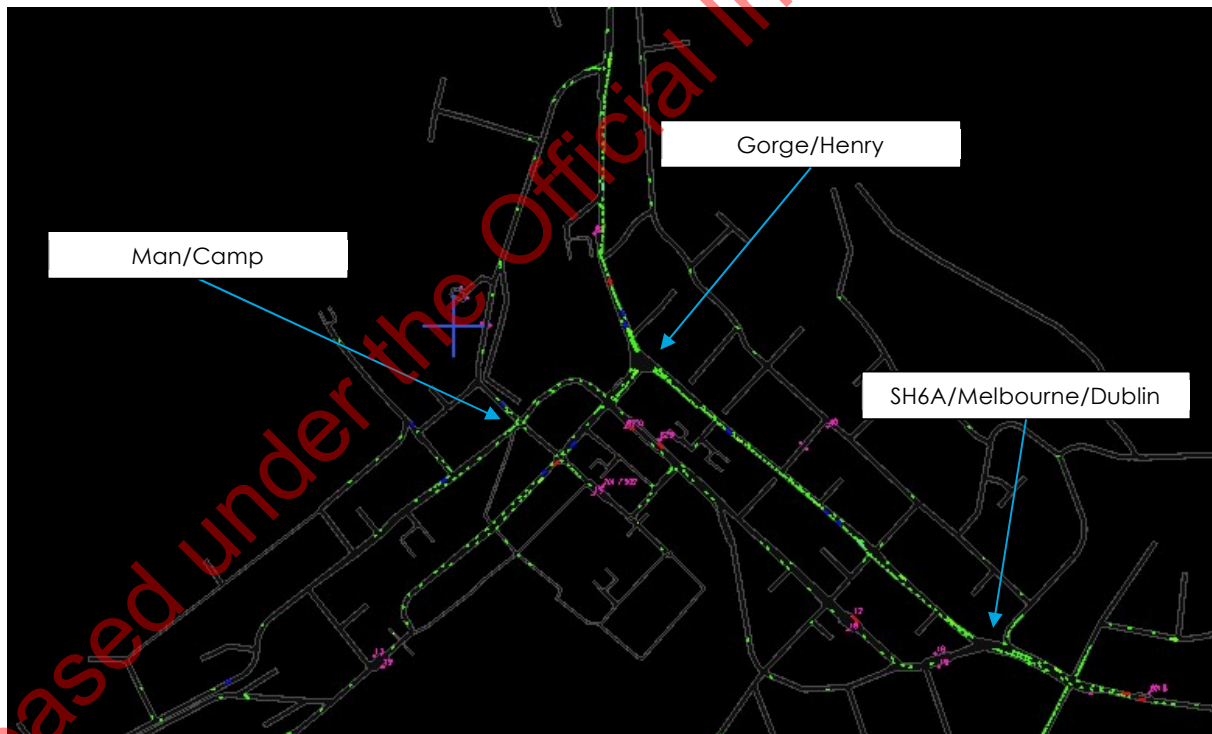


Figure 5-4 NZUP + A1 scenario, Interpeak 2028 at 12:30

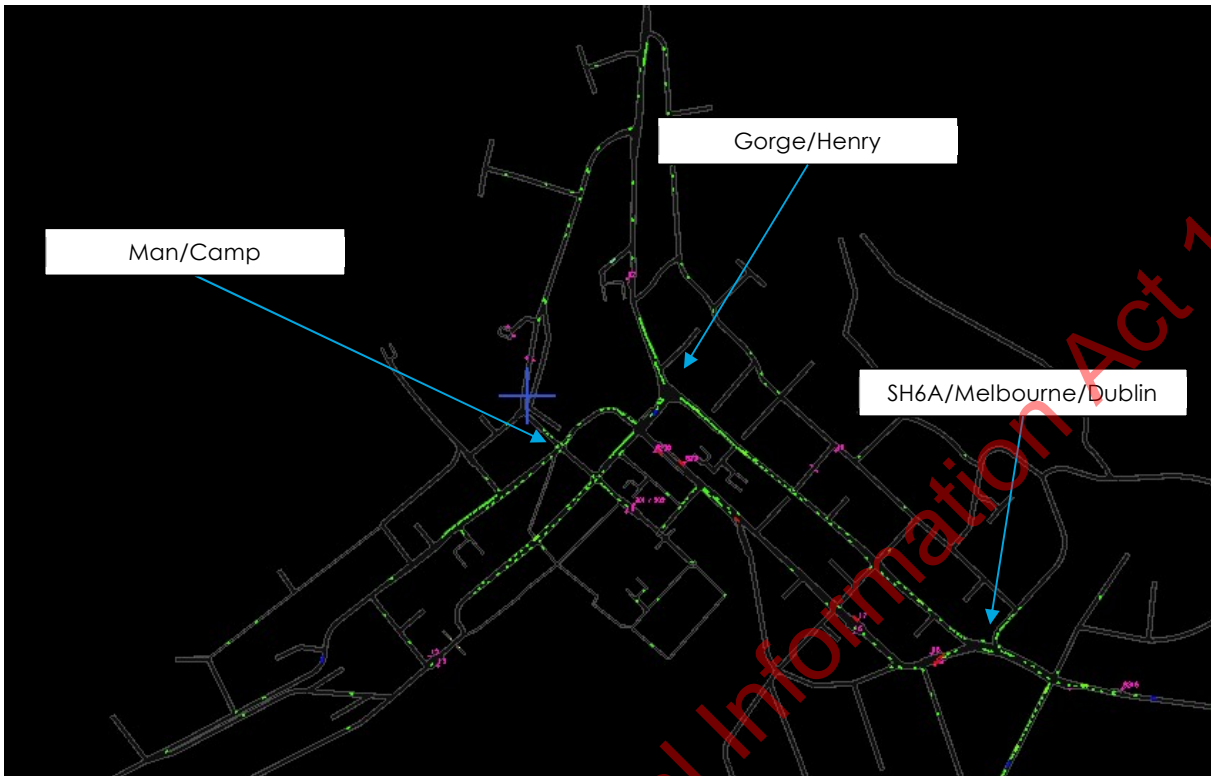


Figure 5-5 NZUP + A1 Stanley Street closed scenario, Interpeak 2028 at 12:30

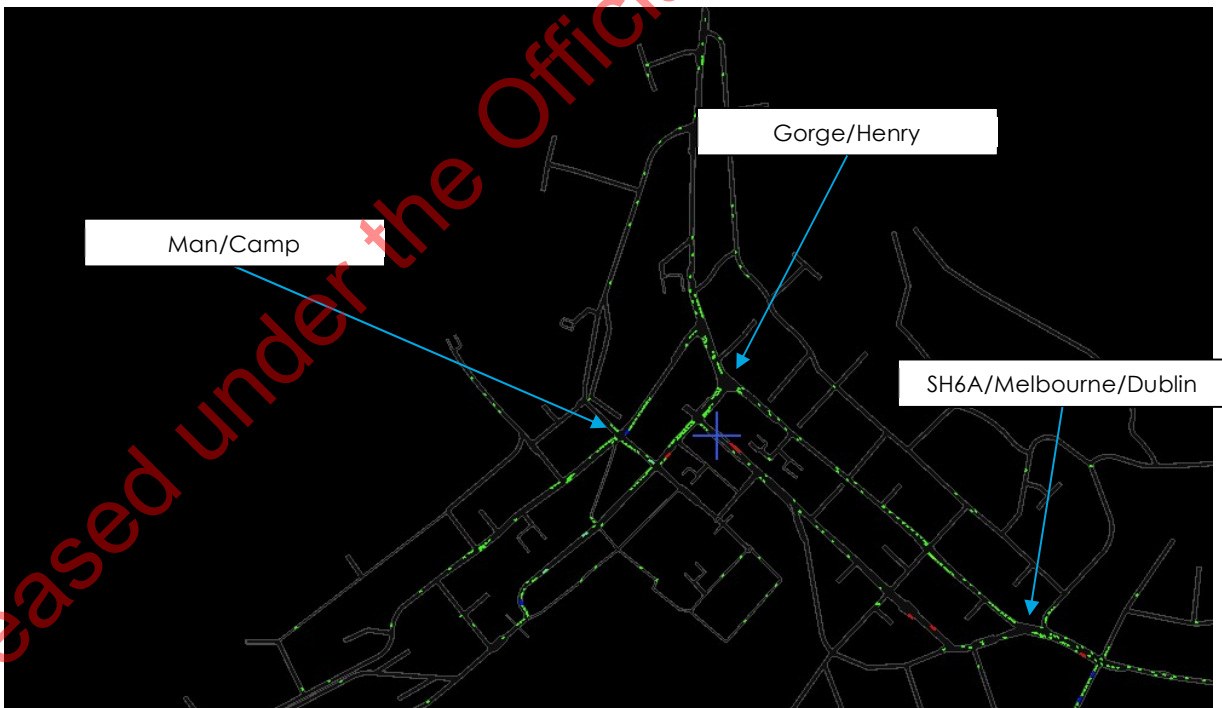


Figure 5-6 NZUP + A12 scenario, Interpeak 2028 at 12:30

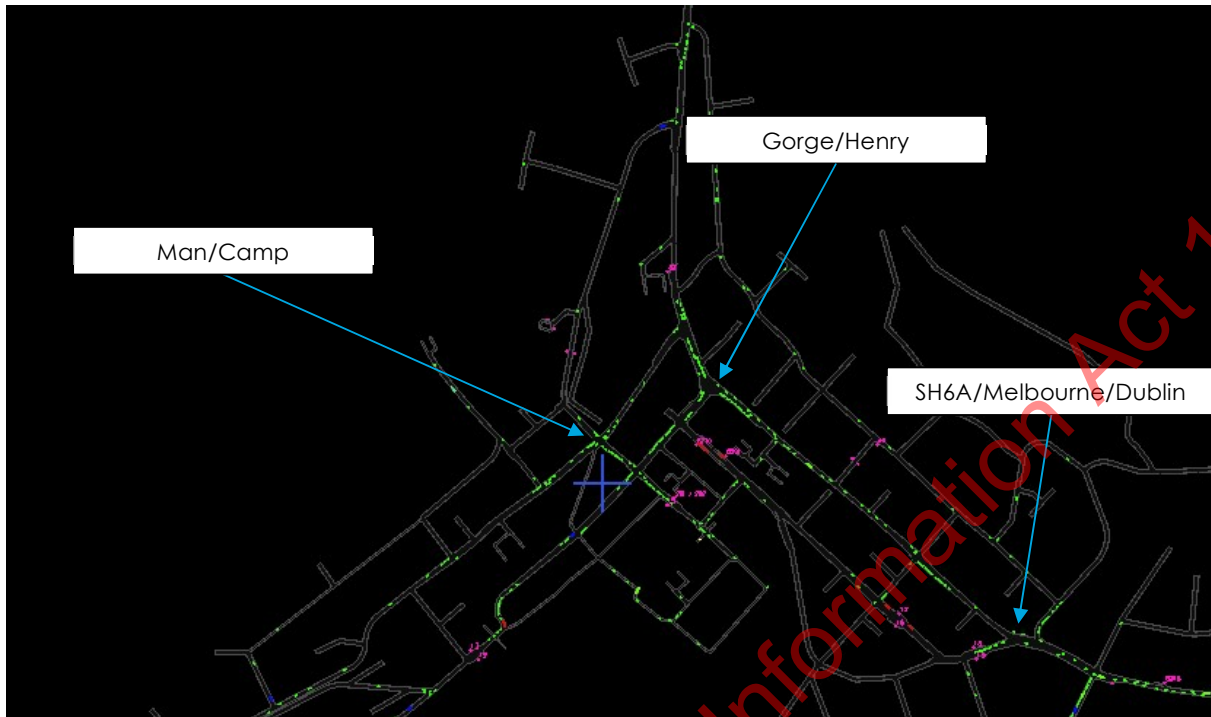


Figure 5-7 NZUP + A12 Stanley Street closed scenario, Interpeak 2028 at 12:30

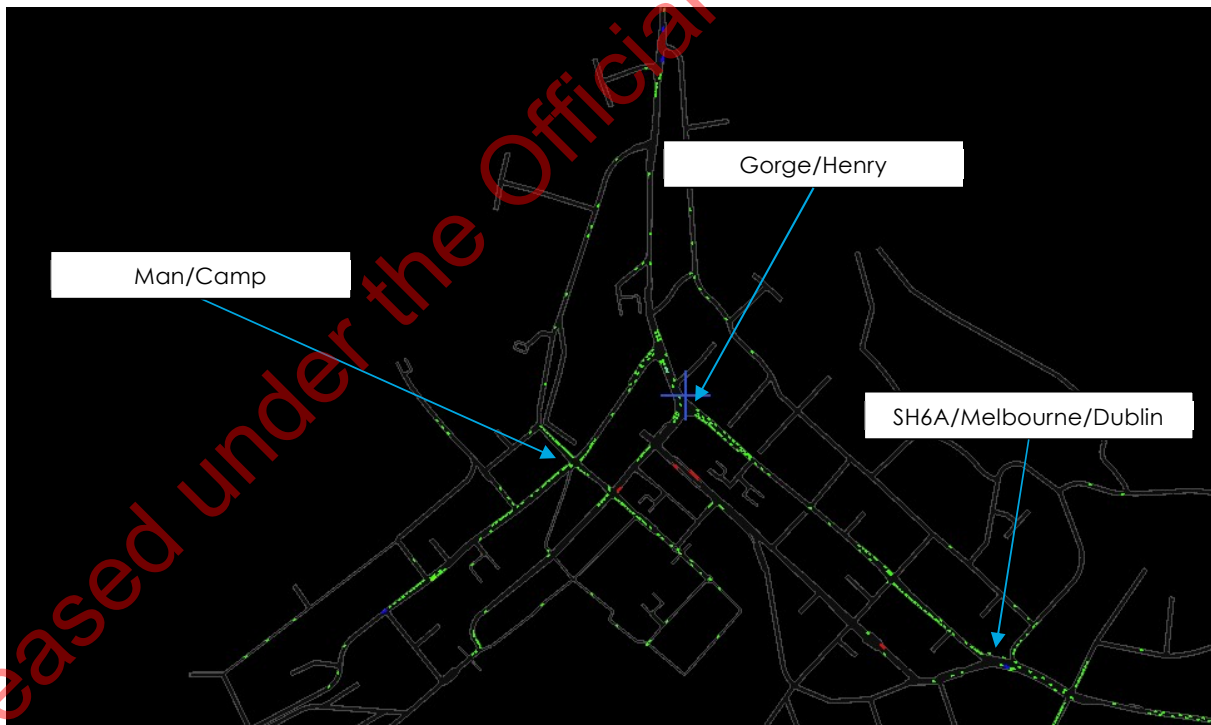


Figure 5-8 NZUP + A123 Stanley Street closed scenario, Interpeak 2028 at 12:30

5.1.1.3 Traffic volumes

Plots of traffic volumes in the Queenstown Town Centre are included in Appendix A.

Table 5-2 summarises the predicted two-way flow volumes on some key links within the Town Centre at 2028 – the volumes from the 2018 Base model is shown for reference to existing conditions.

Table 5-2 2028 two-way flow volumes (vehicles/hour) in Queenstown Town Centre

Scenario	East of Brecon Street		West of Ballarat			
	Man Street	Lake Esplanade	Camp Street	Stanley Street	Henry Street	Hallenstein St
AM Peak (0800-0900)						
Existing 2018	545	851	272	1161	38	388
NZUP + A1 Stanley Open	608	802	77	491	724	294
NZUP + A1 Stanley Closed	624	808	184	40	1122	320
NZUP + A12 Stanley Open	602	803	102	390	823	321
NZUP + A12 Stanley Closed	565	852	145	40	1172	314
NZUP + A123 Stanley Closed	885	427	145	40	1158	320
Interpeak (1200-1300)						
NZUP + A1 Stanley Open	703	901	485	1174	31	482
NZUP + A1 Stanley Closed	858	968	214	733	850	388
NZUP + A1 Stanley Closed	851	966	357	40	1382	497
NZUP + A12 Stanley Open	851	1012	246	558	1147	395
NZUP + A12 Stanley Closed	778	1052	311	40	1563	396
NZUP + A123 Stanley Closed	1084	660	336	40	1540	418
PM Peak (1700-1800)						
NZUP + A1 Stanley Open	754	883	437	1223	39	676
NZUP + A1 Stanley Closed	598	950	108	581	768	441
NZUP + A1 Stanley Closed	584	975	212	40	1208	500
NZUP + A12 Stanley Open	552	952	152	439	810	502
NZUP + A12 Stanley Closed	563	985	224	40	1160	498
NZUP + A123 Stanley Closed	903	509	193	40	1167	513

From the table, the following expected trends are visible:

- Stanley Street – as would be expected, volumes drop when Stage 1 is opened, to between 40-60% of the existing (2018) level, with the Arterial Stage 1 carrying more traffic than Stanley Street even when the through general traffic route on the latter link is kept open
- Henry Street – the new route becomes the principal route in and out of the Town Centre (to/from the east) in all scenarios as would be expected – and has the added advantage of reducing the attractiveness of current alternative routes such as Camp Street and Hallenstein Street
- Camp Street – In all scenarios, volumes on Camp Street are lower than the 2018 base, indicating the impact of shifting car parking spaces out of the historic core. As would be expected, in the scenarios when Stanley Street is closed, volumes on Camp Street increase, although they are still lower than existing levels
- Hallenstein Street – similar to Camp Street, the addition of Arterial Stage 1 results in a drop in traffic volumes on Hallenstein Street, as the existing congestion point of the Shotover/Stanley intersection is relieved. The difference between scenarios with Stanley Street open or closed is negligible, showing that the introduction of Stage 1 has a positive impact on the operation of Hallenstein Street across all scenarios
- Man Street – As might be expected, volumes on Man Street stay relatively flat until Stage 3 of the Arterial route is introduced – at which point, there is a significant re-assignment off Lake Esplanade and on to the new through route to/from One-Mile roundabout

In summary, the results are in line with expectations and show the benefits of the Arterial route being a catalyst for removing traffic from less strategic routes (Camp Street and Hallenstein Street).

5.1.2 SH6A Frankton Road

A comparison of the overall intersection LOS for the key intersections on SH6A is shown in Figure 5-9 to for the AM peak hour (8am to 9am), Figure 5-10 to for the Interpeak hour (12pm to 1pm) and Figure 5-11 to for the PM peak hour (5pm to 6pm). No LOS summary is reported for the 2048 NZUP + A1 Stanley Closed model scenario because no viable data can be obtained due to the model instability.

Key points from the intersection LOS comparisons are:

- As would be expected, given that all network assumptions are the same in all five scenarios represented, the results are similar by scenario for the same year. Any differences are generally just due to the variation in seeded model run – and where the LOS value is close to straddling the upper or lower edge of the LOS band
- In the AM peak period, all intersections are operating satisfactorily at 2018, 2028 and 2048
- In the Interpeak period, all intersections are operating satisfactorily at 2018, 2028 and 2048. Although LOS E/F are encountered at SH6A/Goldfield Heights and SH6A/Hensman Road in some scenarios, this is commonly due to the westbound right turns being over-capacity in short periods within the full two-hour model period. This results in blocking the westbound through movement. As the model has fixed signal timings, rather than adaptive (dynamic) control, these occurrences would be less frequent within the actual operation, as the signal timings would change according to demand. Consequently, it is not expected that the LOS E/F would eventuate even at 2048 in this period. The network strategy would be to actively manage the traffic heading eastbound along SH6A at the eastern end (i.e. at SH6/SH6A) so as to maintain a reasonable LOS and travel times for buses along SH6A. This would also help to smooth out such infrequent occasions of peaked demand for the right turns at the intermediate intersections
- In the PM peak period:
 - Operation is satisfactory at 2018 and 2028
 - At 2048, operation is predicted to exhibit LOS F across the corridor. This is predominantly in the eastbound direction, as shown in Figure 5-12 with queues stretching back from SH6/SH6A to SH6A/Goldfield Heights intersection, and is due to the limitation of capacity at the SH6/SH6A intersection to accommodate the forecast demands. It is likely that green time would be further biased towards the SH6A approach, to ensure that queues on the eastbound approach of SH6A did not adversely affect bus travel times (where physical bus infrastructure is very difficult and costly to provide). Therefore, it is expected that a LOS D (or at the worst LOS E) would be experienced for the movements along SH6A. It should also be noted that since this modelling was undertaken, some capacity improvements have been made to the proposed intersection upgrade at SH6/SH6A, which significantly relieve congestion at this location, and particularly on the SH6A approach. However, the forecast queues lengths and high delay are still likely on the two SH6 approaches to this intersection

In summary, operation is satisfactory along SH6A in both directions. Westbound, the improvements in the Town Centre along with the NZUP package encouraging a greater PT mode share have ensured that all traffic volumes can be accommodated at all intermediate intersections. There are no queues predicted to block back from the Town Centre due to congestion. Greater control is also provided throughout the network, and the SH6/SH6A and SH6 Frankton signalised intersections will ensure that the level of traffic is gated at the entry point to SH6A, with any excess demand held within Frankton, where bus priority lanes can bypass any such queues.

In the eastbound direction, although some significant delay and queue levels are predicted at 2048 PM peak (in all scenarios), it is expected that these queue levels will not be experienced, due to a combination of a subsequent capacity increase at the SH6/SH6A intersection, and increasing green time for the SH6A leg to ensure that traffic and PT delay is minimised on this approach.

Figure 5-9 Overall intersection LOS summary AM peak hour (SH6A)

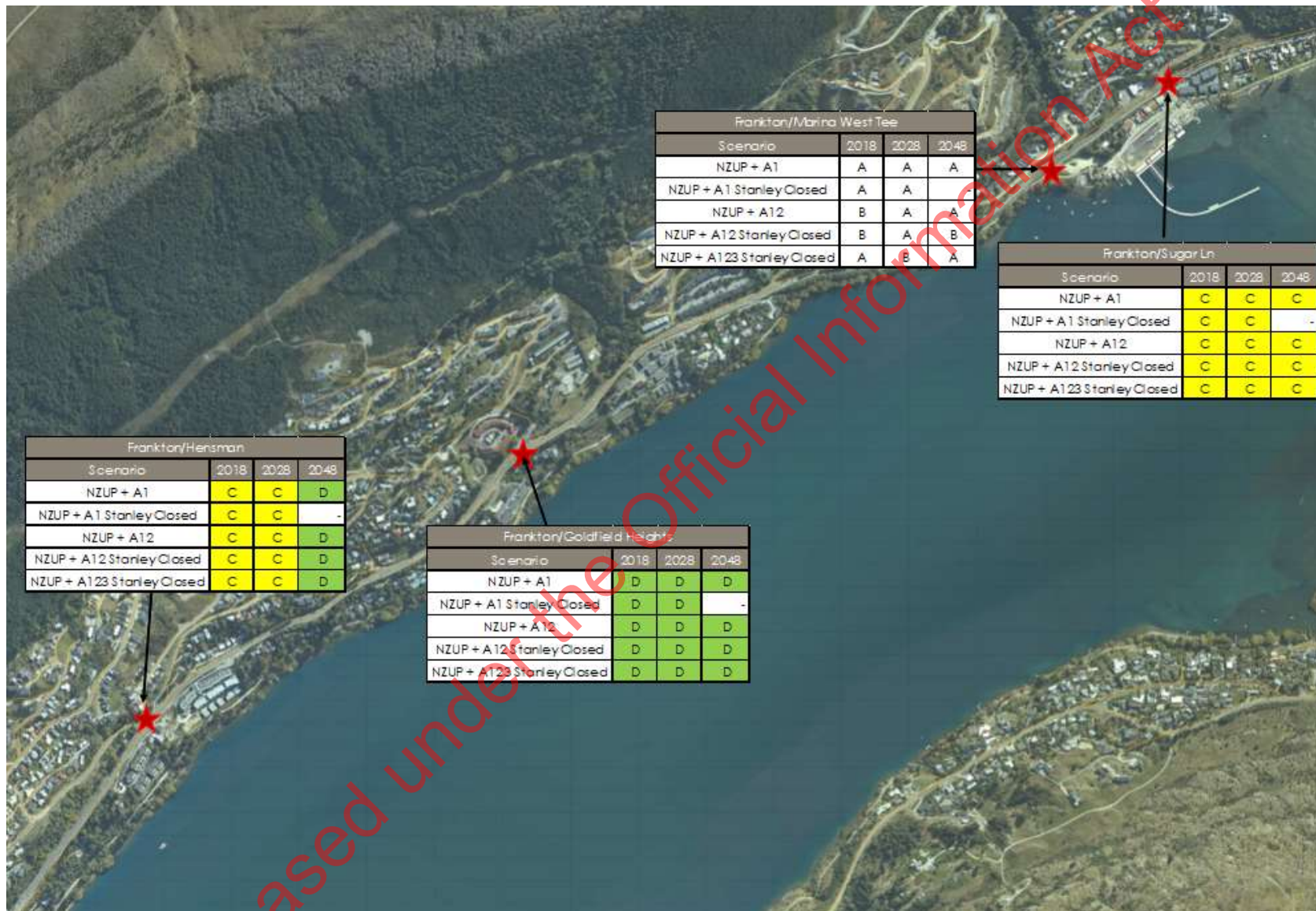


Figure 5-10 Overall intersection LOS summary Interpeak hour (SH6A)

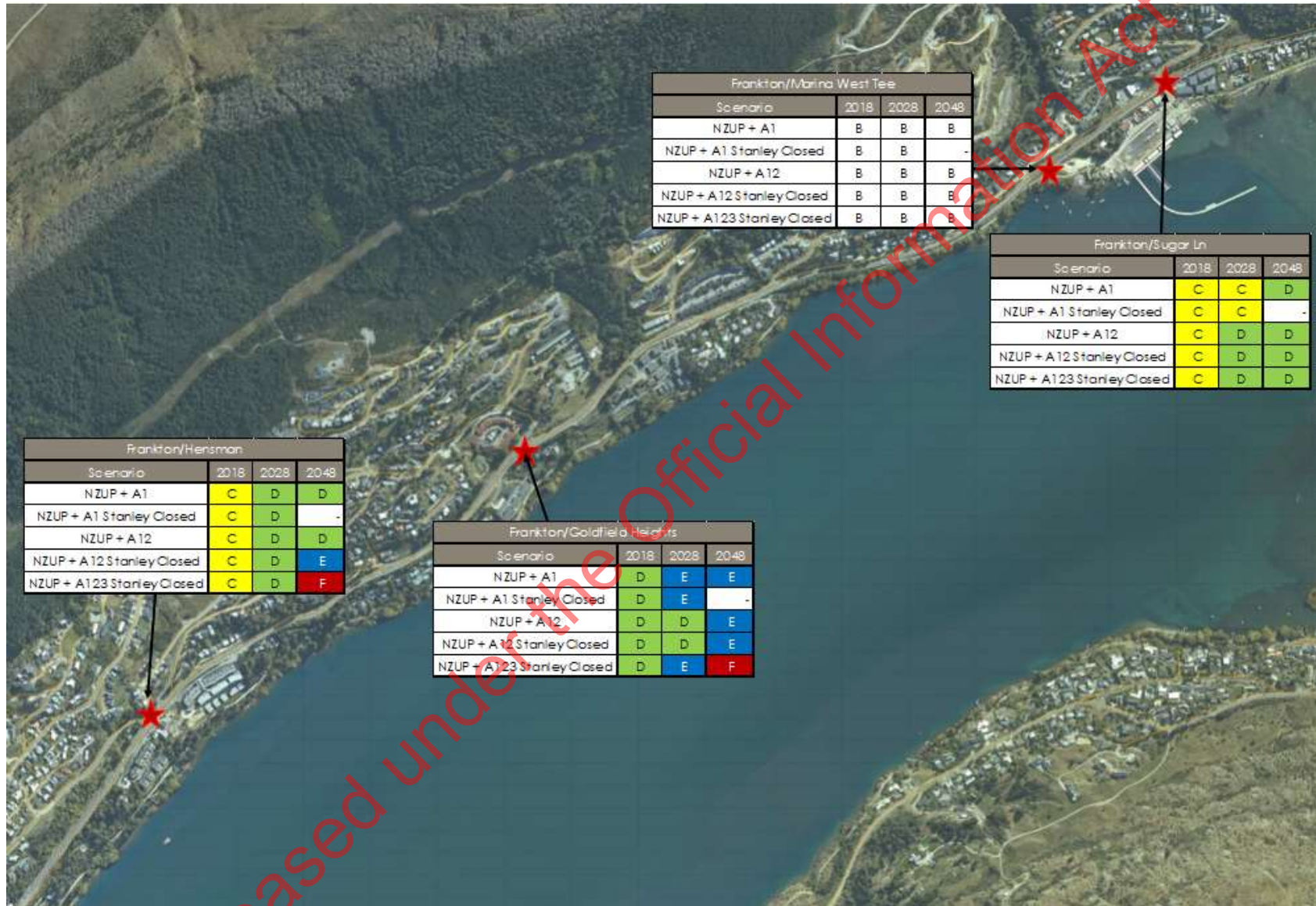
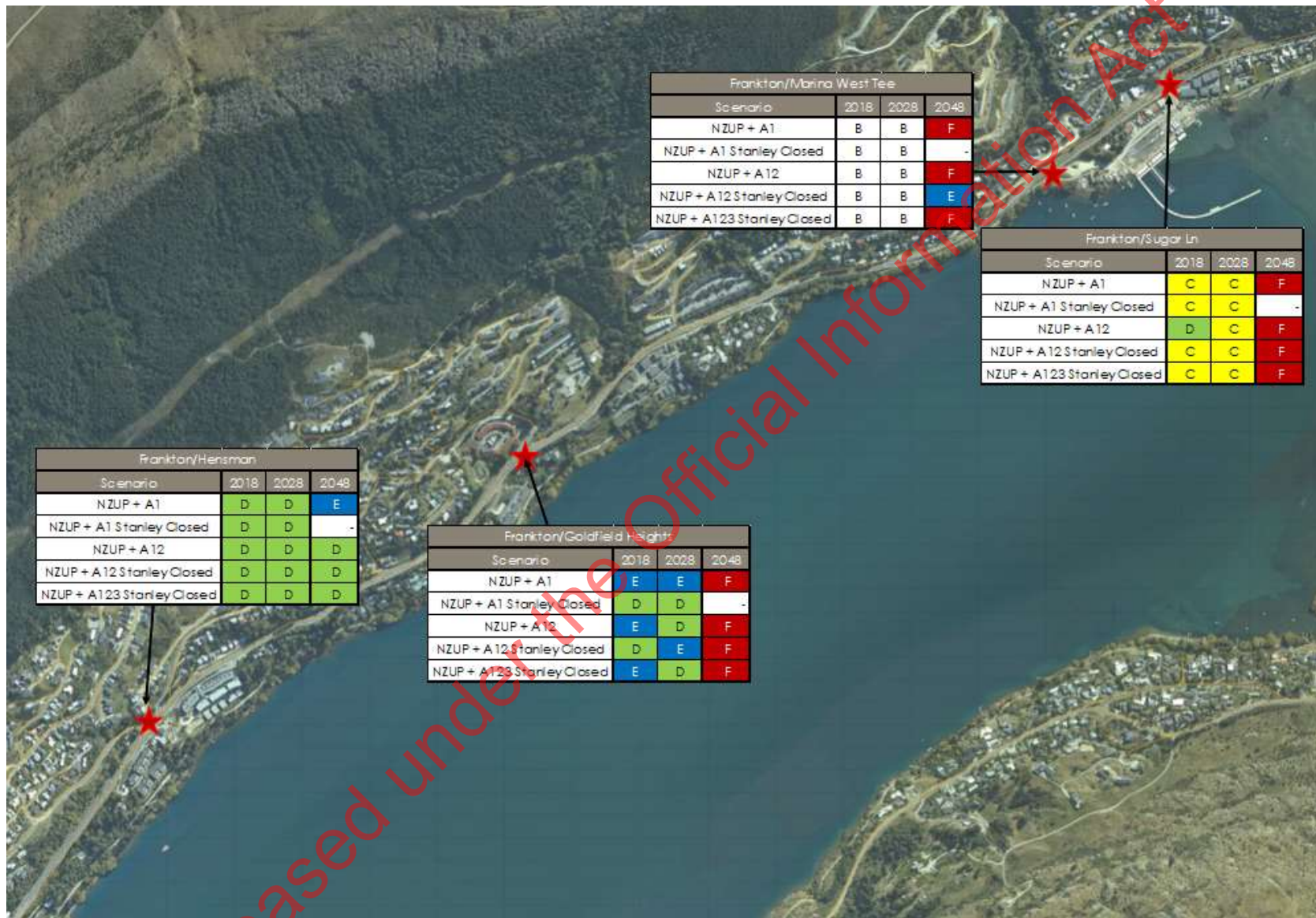


Figure 5-11 Overall intersection LOS summary PM peak hour (SH6A)



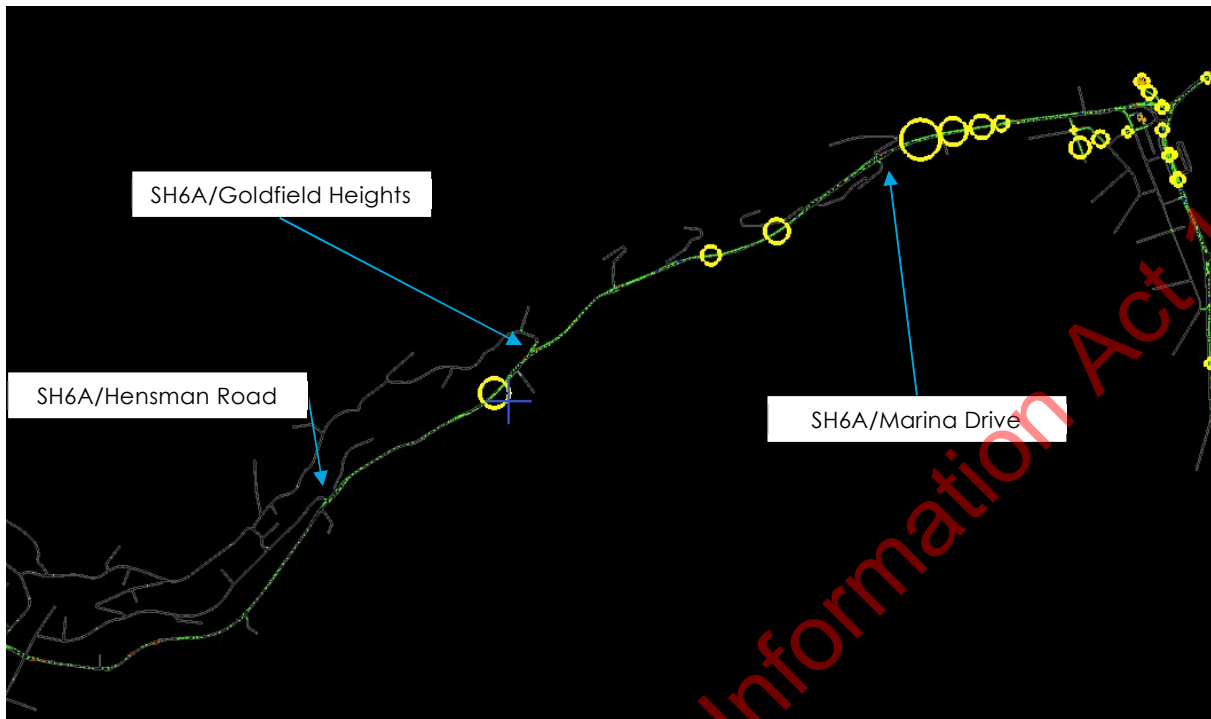


Figure 5-12 Operation of SH6A Frankton Road in the PM peak period (at 17:30) at 2048 in the NZUP+Art12 scenario

5.1.3 Frankton

A comparison of the overall intersection LOS for the key intersections in Frankton is shown in Figure 5-13 for the AM peak hour (8am to 9am), Figure 5-14 for the Interpeak hour (12pm to 1pm) and Figure 5-15 for the PM peak hour (5pm to 6pm). No LOS summary is reported for the 2048 NZUP + A1 Stanley closed model scenario because no viable data can be obtained due to the model instability as a result of modelled congestion.

Key points from the intersection LOS comparisons are:

- As would be expected, given that all network assumptions are the same in all five scenarios represented, the results are similar by scenario for the same year. Any differences are generally just due to the variation in seeded model run – and where the LOS value is close to straddling the upper or lower edge of the LOS band
- In the AM peak period, most intersections are operating satisfactorily at 2018 and 2028. At 2048, stress is being encountered at the SH6/Hawthorne Drive intersection (in particular), but also at the southern end of SH6 Kawarau Road. Figure 5-16 shows a screenshot of the operation of the network at 08:30 in the NZUP Art12 scenario. This demonstrates that traffic heading into the network over the two bridges is starting to flood the downstream Frankton network
- In the Interpeak period:
 - Operation is satisfactory at 2018
 - At 2028, operation is predicted to be stressed, particularly at the SH6/Grant Road and Hawthorne Drive intersections. This LOS result is slightly misleading, as it is the SH6/SH6A and SH6/Hawthorne Drive intersections that are the key constraints in the network. As LOS delay is only measured from the upstream intersection, delay caused at the SH6/SH6A intersection is actually being recorded at the SH6/Grant Road intersection. Figure 5-17 shows the operation in this period, demonstrating the congestion on the SH6 Eastern Corridor
 - At 2048 in the Interpeak period, operation is also stressed, but the worst condition is now on the SH6 Southern Corridor (see Figure 5-18). As for 2028, most of the congestion is due to the SH6/SH6A intersection, with queues stretching back to Kawarau Falls Bridge and Remarkables Park Town Centre. This is somewhat a question of the priority afforded at the SH6/SH6A intersection, as green

time could be re-allocated from the eastern approach to the southern approach to better balance the congestion. However, in any case, the network is unable to accommodate the forecast traffic volumes.

- In the PM peak period:
 - Operation is satisfactory at 2018, although the SH6/Hawthorne Drive intersection is predicted to be at capacity in terms of movements towards Shotover Bridge. This is a reflection of the stress in the network that is currently experienced on street during the busiest part of the PM peak hour.
 - At 2028, operation is predicted to be stressed, particularly at the SH6/Grant Road, SH6/Hawthorne Drive and SH6/Lucas Place intersections. As for the Interpeak, this LOS result is slightly misleading, as it is the SH6/SH6A and SH6/Hawthorne Drive intersections that are the key constraints in the network. Figure 5-19 shows the operation in this period, demonstrating the congestion on the SH6 Eastern Corridor.
 - At 2048, operation is stressed to a further degree, as shown in Figure 5-20. All three approaches to the SH6/SH6A intersection have significant queues towards and beyond the two bridges to the east and south, and along SH6A. There is also localised congestion around McBride Street and the Terrace Junction/BP approach, with vehicles on these links unable to access SH6 and SH6A efficiently. In the case of SH6A, it is likely that green time would be biased towards this approach, to ensure that queues on the eastbound approach of SH6A did not adversely affect bus travel times (where physical bus infrastructure is very difficult and costly to provide).

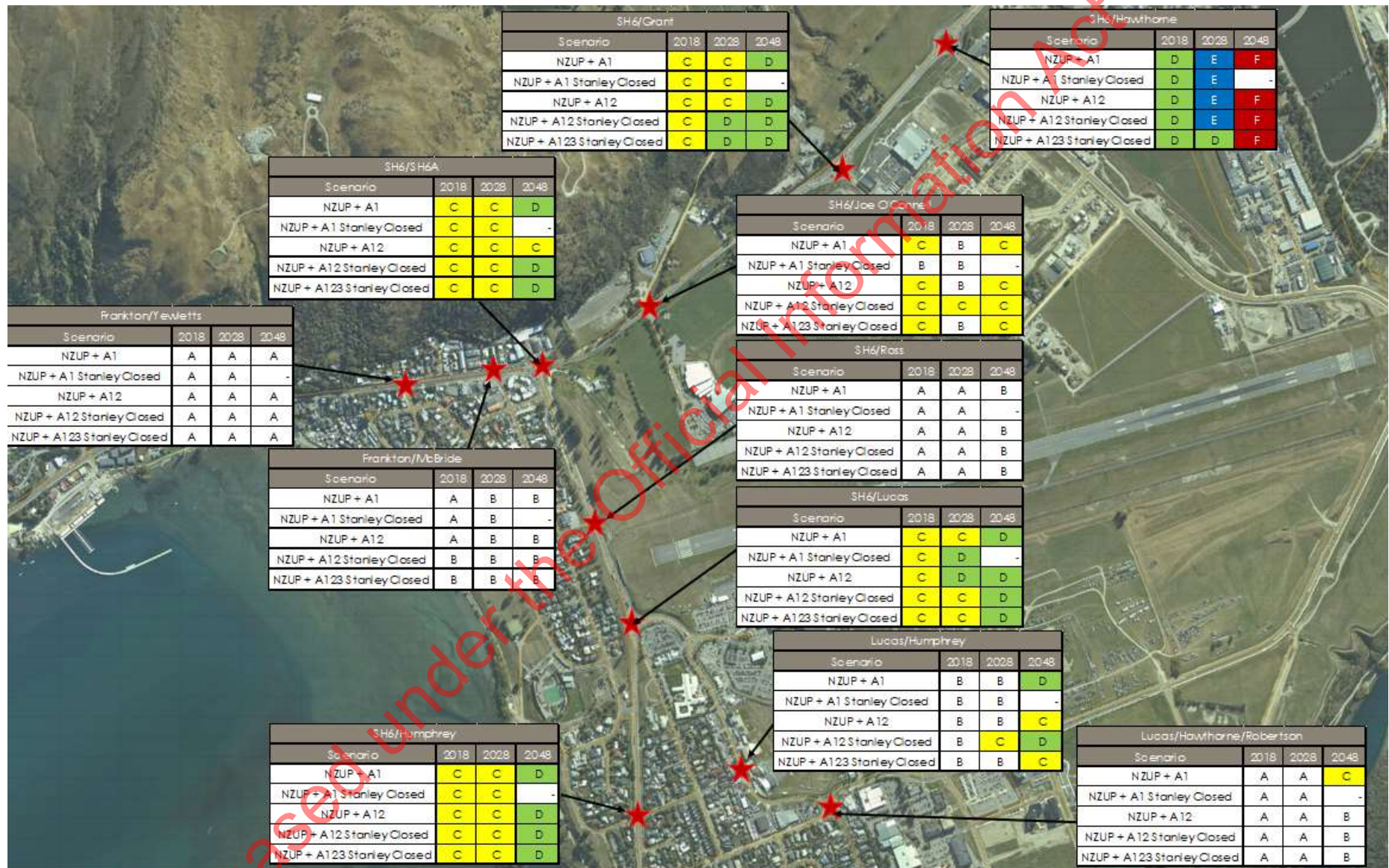
In summary, operation up to 2028 is generally acceptable within Frankton, but by 2048 severe congestion is expected. This demonstrates the importance of maximising PT mode share, as well as encouraging a higher active travel trip proportion. Adding additional road capacity, for example at the critical SH6/SH6A intersection, would not provide a long-term solution, as widening would be required across the whole of Frankton Flats (to be compatible with any capacity uplift at SH6/SH6A), including additional and/or duplication of existing bridges.



Stantec



Figure 5-13 Overall intersection LOS summary AM peak hour (Frankton)

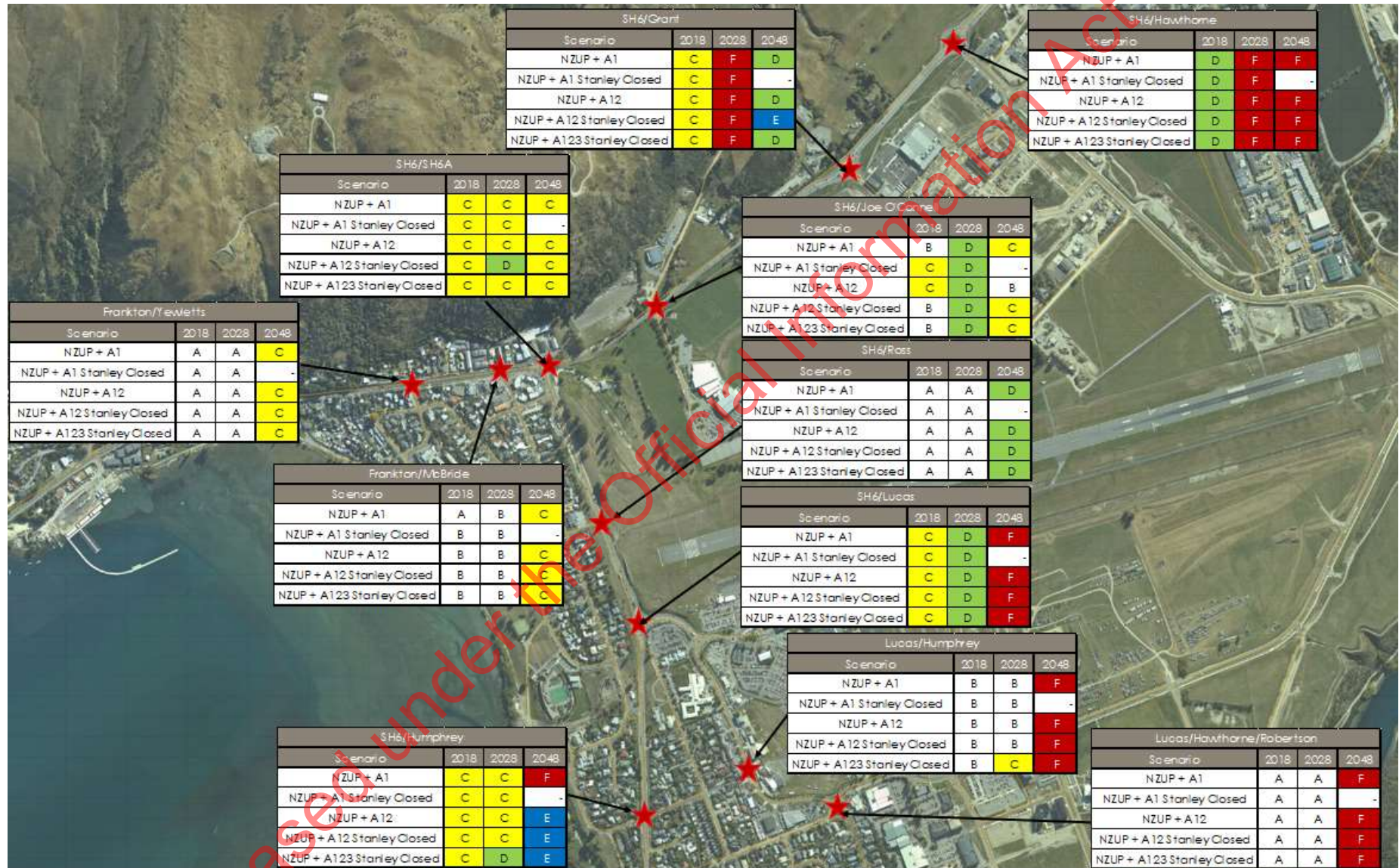




Stantec



Figure 5-14 Overall intersection LOS summary Interpeak hour (Frankton)

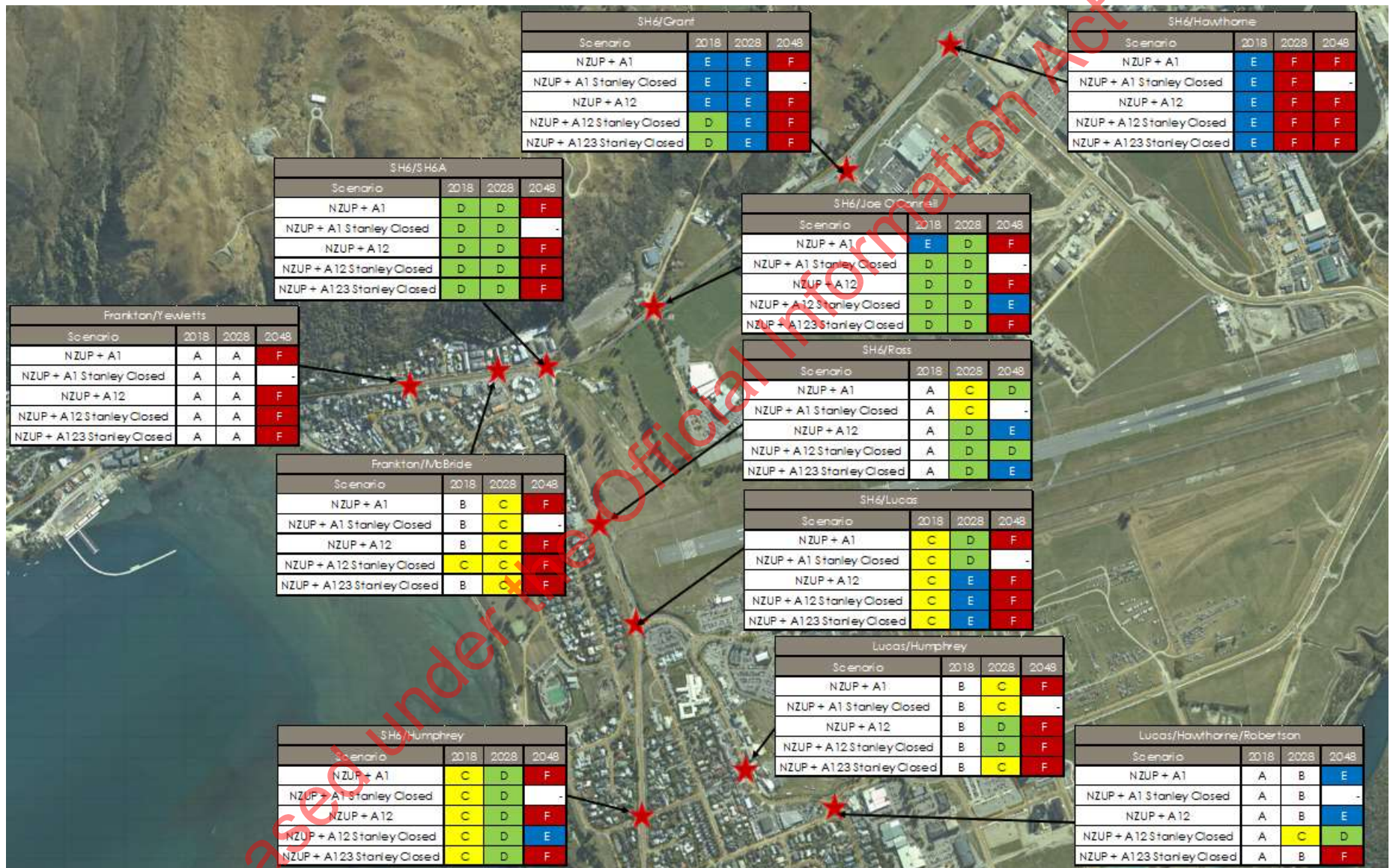




Stantec



Figure 5-15 Overall intersection LOS summary PM peak hour (Frankton)



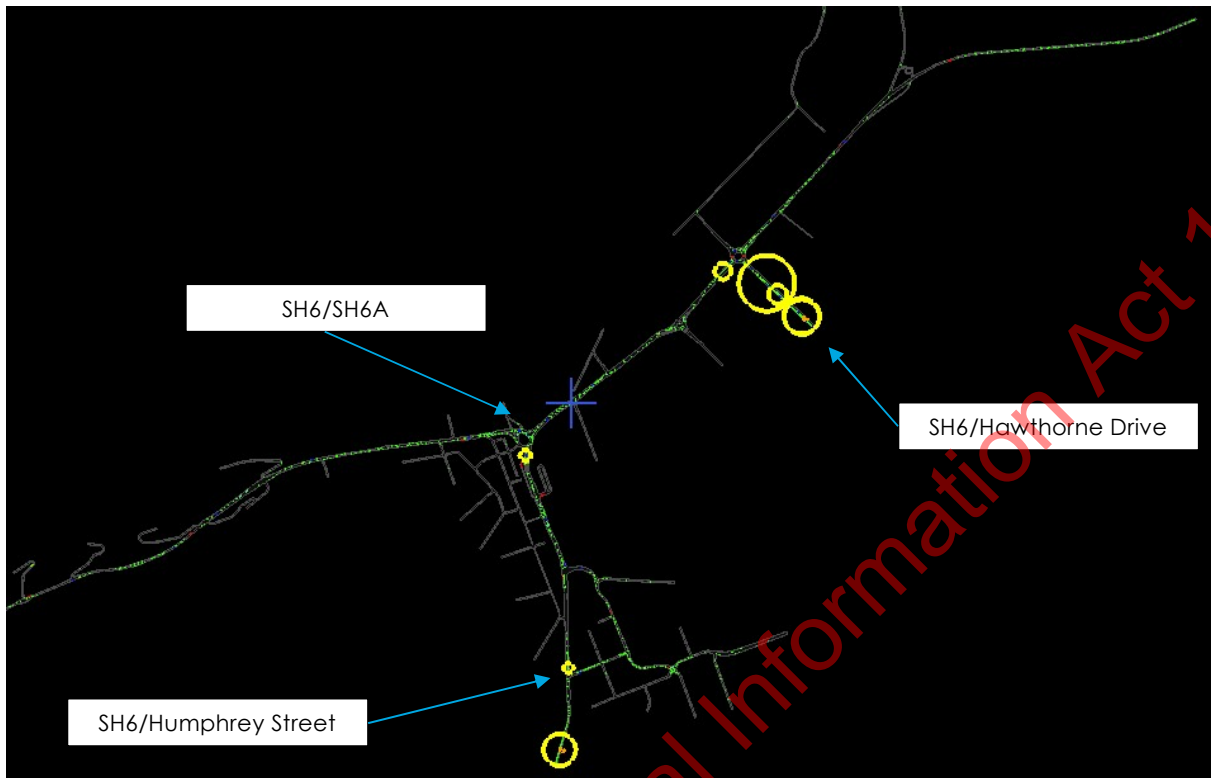


Figure 5-16 Operation of Frankton in the AM peak period (at 08:30) at 2048 in the NZUP+Art12 scenario



Figure 5-17 Operation of Frankton in the Interpeak period (at 13:00) at 2028 in the NZUP+Art12 scenario

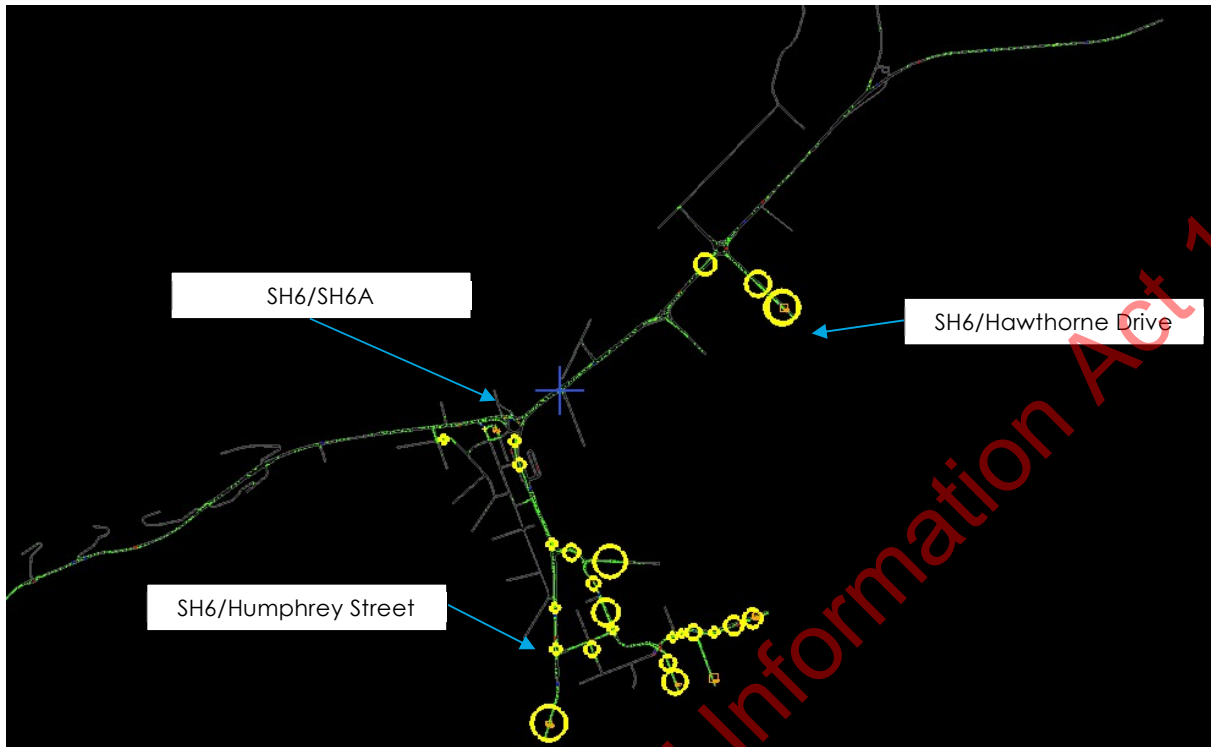


Figure 5-18 Operation of Frankton in the Interpeak period (at 13:00) at 2048 in the NZUP+Art12 scenario



Figure 5-19 Operation of Frankton in the PM peak period (at 17:30) at 2028 in the NZUP+Art12 scenario

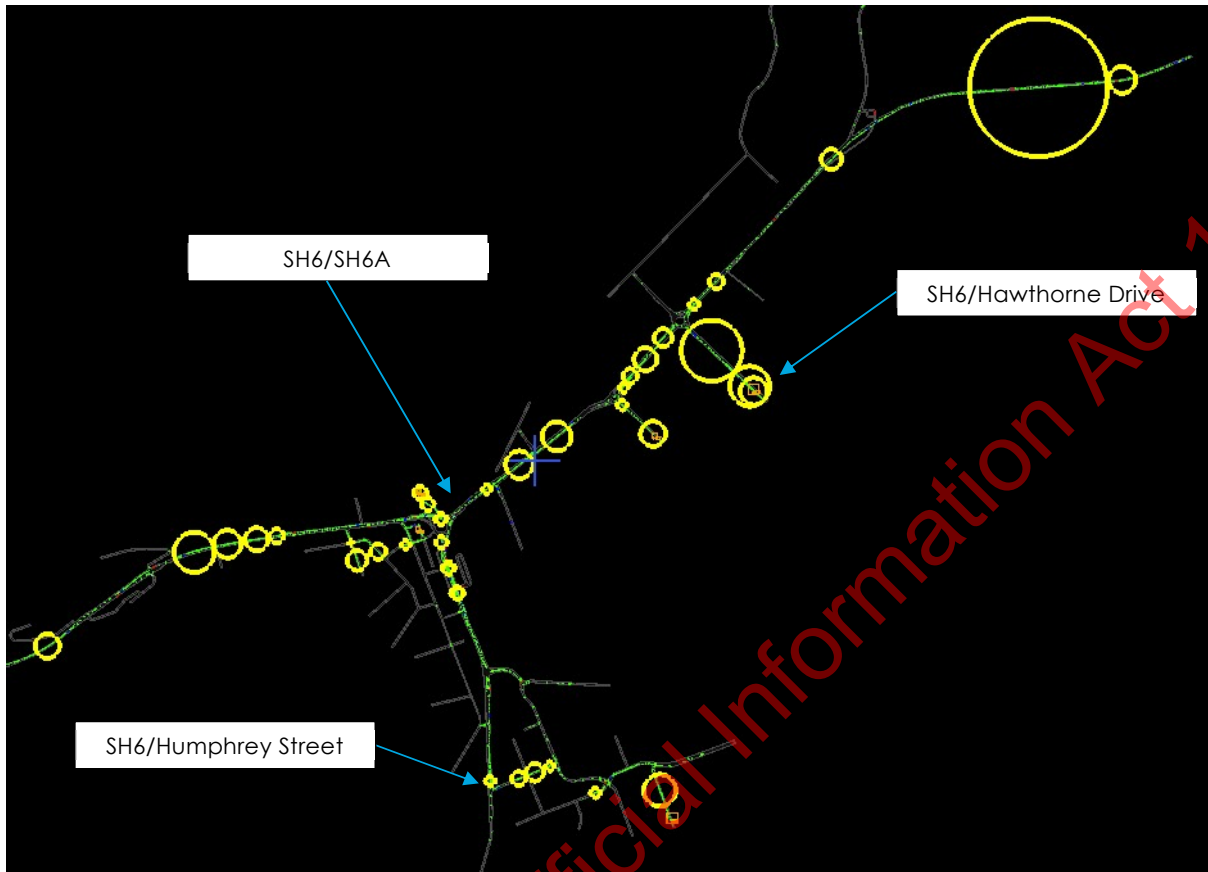


Figure 5-20 Operation of Frankton in the PM Peak period (at 13:00) at 2048 in the NZUP+Art12 scenario

5.2 Travel Times

Modelled travel times in the 2018, 2028 and 2048 models have been collected for the following three key routes:

- SH6 Shotover Bridge to SH6/SH6A
- SH6/SH6A to Fernhill Roundabout (via Lake Esplanade)
- Arterial (Dublin Street to Hay Street) – maximising use of Arterial sections where available

The routes were split into several segments each but the overall travel times were reported in this analysis by direction and for each of the peak hour periods (08:00-09:00, 12:00-13:00 and 17:00-1800). The travel time on all three key routes for all modelled scenarios is summarised in Table 5-3 to Table 5-5 respectively. No travel time is reported for the 2048 NZUP + A1 Stanley Closed scenario due to model instability.

Key points from Table 5-3 for the SH6/SH6A to Shotover Bridge journey are:

- As would be expected, as the differences in scenarios are all within the Queenstown Town Centre, there is little difference in travel times for this section in Frankton, between scenarios.
- There is a significant increase in westbound travel times between 2018 and 2028 due to an increase in congestion on the westbound approach to SH6/SH6A, as shown in Figure 5-17. This travel time then drops down at 2048 – as explained in the previous section this is just due to green time allocation at the SH6/SH6A intersection, which results in more congestion on the northbound SH6 Kawarau Road approach.
- There is a significant increase in westbound travel times between 2028 and 2048 due to an increase in congestion on the westbound approach to SH6/SH6A, as shown in Figure 5-20



Table 5-3 Travel time (seconds) comparison for Shotover Bridge to SH6/SH6A

Scenario	2018						2028						2048					
	AM Peak Hour 8-9am		Interpeak Hour 12-1pm		PM Peak Hour 5-6pm		AM Peak Hour 8-9am		Interpeak Hour 12-1pm		PM Peak Hour 5-6pm		AM Peak Hour 8-9am		Interpeak Hour 12-1pm		PM Peak Hour 5-6pm	
	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound
NZUP + A1	321	231	292	243	432	303	319	238	539	259	379	287	347	245	316	272	1062	241
NZUP + A1 + Stanley Closed	317	231	292	242	407	332	300	237	489	257	386	282	-	-	-	-	-	-
NZUP + Art12	336	230	296	244	415	309	305	237	529	256	396	272	380	244	299	273	1135	238
NZUP + Art12 + Stanley Closed	328	232	288	243	416	290	325	239	540	264	408	293	391	243	326	272	1011	240
NZUP + Art123 + Stanley Closed	327	232	293	241	422	299	312	238	498	258	410	280	393	244	328	274	1291	237



Table 5-4 Travel time (seconds) comparison for SH6/SH6A to Fernhill roundabout

Scenario	2018						2028						2048					
	AM Peak Hour 8-9am		Interpeak Hour 12-1pm		PM Peak Hour 5-6pm		AM Peak Hour 8-9am		Interpeak Hour 12-1pm		PM Peak Hour 5-6pm		AM Peak Hour 8-9am		Interpeak Hour 12-1pm		PM Peak Hour 5-6pm	
	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound
NZUP + A1	759	765	770	834	784	841	749	762	1193	838	793	783	769	768	972	967	752	1646
NZUP + A1 + Stanley Closed	709	721	734	860	737	862	700	740	858	868	753	764	-	-	-	-	-	-
NZUP + Art12	767	790	751	830	782	868	746	779	821	874	806	791	771	798	801	938	809	1828
NZUP + Art12 + Stanley Closed	748	756	745	778	767	826	731	738	777	859	783	776	773	756	807	978	774	1525
NZUP + Art123 + Stanley Closed	755	727	755	783	781	826	745	737	816	848	813	765	779	746	841	1049	755	1514



Table 5-5 Travel time (seconds) comparison for Arterial (Dublin Street to Hay Street)

Scenario	2018						2028						2048					
	AM Peak Hour 8-9am		Interpeak Hour 12-1pm		PM Peak Hour 5-6pm		AM Peak Hour 8-9am		Interpeak Hour 12-1pm		PM Peak Hour 5-6pm		AM Peak Hour 8-9am		Interpeak Hour 12-1pm		PM Peak Hour 5-6pm	
	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound
NZUP + A1	371	247	380	289	310	291	358	265	844	311	295	257	356	274	567	557	316	300
NZUP + A1 + Stanley Closed	222	245	241	309	229	298	218	262	324	336	220	256	-	-	-	-	-	-
NZUP + Art12	303	226	305	263	290	273	303	241	333	299	289	239	320	273	333	425	327	331
NZUP + Art12 + Stanley Closed	292	212	292	232	288	243	287	216	321	267	285	228	283	224	320	353	292	277
NZUP + Art123 + Stanley Closed	295	237	298	267	290	271	288	250	325	297	285	241	292	254	327	410	289	308

Key points from Table 5-4 for the SH6/SH6A to Fernhill roundabout journey are:

- At 2028, there is little difference between the travel times experienced in either direction by scenario, except for the westbound movement in the NZUP + Art1 scenario in the Interpeak, where average travel times are around 300-400 seconds longer than the other scenarios. This is consistent with the visualisations and LOS results in the previous sections, and demonstrates that the additional route choice in the network (and more complicated phase arrangements at the key Stanley/Shotover and Gorge/Henry intersections) are resulting in poorer operational performance compared to the other scenarios.
- There is a significant increase in eastbound travel times between 2028 and 2048 in all scenarios due to an increase in congestion on the eastbound approach to SH6/SH6A, as shown in Figure 5-12. As noted in earlier sections, this would likely be relieved by providing more green time on this approach. Note, that the travel times experienced in the Queenstown Town Centre section of the journey are similar to the 2028 levels, demonstrating that operation through the Town Centre is satisfactory at 2048.

Key points from Table 5-5 for the Arterial route are:

- In all three years, the addition of Stage 2 of the Arterial results in a moderate improvement in travel times in the eastbound direction, particularly compared to the Arterial stage 1 Stanley Street open scenario. In the westbound direction, results are the opposite, likely as a result of additional travel time due to the number of controlled intersections after the introduction of Stage 2 of the Arterial
- Once Stage 3 of the Arterial is added, eastbound movements along the route experience an increase in travel time. This is to be expected as the volumes increase due to the through connection to Fernhill roundabout being available. Conversely this will improve travel times along the Lake Esplanade corridor.

It should be noted that it would generally be expected that travel times would increase with the addition of signalised intersections within the town centre network. These offer safety improvements for pedestrians (all signals have been coded to include Barnes Dance pedestrian phases), and greater control of the traffic network, but will apply a residual increase in signal delay.

5.3 Bus Travel Times

A total of eight bus travel time sections have been coded for all 2018, 2028 and 2048 model scenarios, as below, and as shown diagrammatically in Figure 5-21:

- Section 1 – Fernhill roundabout to Queenstown bus hub
- Section 2 – Gorge Road Industrial Estate to Queenstown bus hub
- Section 3 – Queenstown bus hub to Frankton bus hub
- Section 4 – Remarkables Park Town Centre to Kawarau Falls Bridge
- Section 5 – Frankton bus hub to Airport
- Section 6 – Airport to Remarkables Park Town Centre
- Section 7 – Frankton bus hub to Shotover Bridge
- Section 8 – Hawthorne Drive to Quail Rise

Average bus travel times along the eight bus route sections for 2018 are included in Table 5-6. A comparison of the 2028 and 2018 bus average travel times is shown in Table 5-7, while the comparison of the 2048 and 2028 average bus travel times is demonstrated in Table 5-8. No average bus travel time is reported for the 2048 NZUP + A1 + Stanley Closed scenario due to the model instability. Similarly, no average bus travel time is reported for most of the eastbound bus routes during the evening peak hour for the 2048 NZUP + A12 + Stanley Closed scenario. Average travel time for route 4 is also not available for certain scenarios in 2028 and 2048.

Table 5-7 shows that most buses in 2028 are expected to travel within a minute difference to the 2018 average travel times for all model scenarios. There is a significant increase in travel time of 5 to 6 minutes expected for travel time section 2 southbound in the NZUP + A1 scenario Interpeak period, which is consistent with the significant queues on Gorge Road shown in Figure 5.4. But on the whole, bus travel times are reliable due to the priority afforded through the physical infrastructure provided through the NZUP package.



Figure 5-21 Bus Travel Time Sections



Table 5-6 2018 Bus Average Travel Time (seconds)

		2018														
		NZUP + A1			NZUP + A1 + Stanley Closed			NZUP + Art12			NZUP + Art12 + Stanley Closed			NZUP + Art123 + Stanley Closed		
Bus Route		AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour
Bus 1E	Eastbound	466	479	485	447	507	486	486	479	467	504	492	473	462	458	441
Bus 1W	Westbound	294	300	306	301	324	324	350	354	350	351	360	353	327	349	345
Bus 2N	Northbound	235	243	244	229	219	225	228	239	240	240	237	234	228	237	232
Bus 2S	Southbound	442	401	311	363	376	374	331	343	366	325	367	338	349	369	366
Bus 3E	Eastbound	1164	1206	1273	1201	1273	1345	1204	1248	1291	1155	1252	1319	1161	1259	1317
Bus 3W	Westbound	1228	1175	1207	1222	1176	1221	1209	1187	1228	1195	1168	1204	1187	1169	1204
Bus 4N	Northbound	156	160	156	160	159	156	158	159	163	155	162	152	155	163	170
Bus 4S	Southbound	250	248	253	246	282	242	246	247	242	247	255	237	245	250	248
Bus 5N	Northbound	185	230	263	192	231	257	181	231	257	184	230	253	184	231	245
Bus 5S	Southbound	113	100	98	114	99	98	117	102	100	111	97	97	123	95	102
Bus 6N	Northbound	128	136	122	125	133	122	121	133	120	127	126	122	126	135	119
Bus 6S	Southbound	103	104	104	103	104	104	103	104	105	103	104	104	103	104	105
Bus 7E	Eastbound	501	518	515	493	504	507	499	507	505	509	509	507	504	509	498
Bus 7W	Westbound	447	440	447	446	438	442	446	437	444	447	436	442	447	439	441
Bus 8S	Southbound	271	270	272	270	268	272	272	268	269	275	268	273	272	269	274
Bus 8N	Northbound	383	370	361	384	374	366	384	369	366	383	375	366	381	368	363

Table 5-7 2018-28 Change in Bus Average Travel Time (seconds)

Bus Route		2018-28 Changes														
		NZUP + A1			NZUP + A1 + Stanley Closed			NZUP + Art12			NZUP + Art12 + Stanley Closed			NZUP + Art123 + Stanley Closed		
		AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour
Bus 1E	Eastbound	-5	-10	-4	-8	-18	-32	4	-32	-6	-27	-3	16	-1	-15	5
Bus 1W	Westbound	-11	0	-12	6	11	-14	-20	1	-9	1	-5	11	19	9	-18
Bus 2N	Northbound	0	18	-15	1	2	6	2	2	-4	-9	7	-3	16	-3	-9
Bus 2S	Southbound	0	331	-11	-5	1	1	-6	-6	-39	6	-11	3	-16	-7	-21
Bus 3E	Eastbound	36	66	-55	42	66	-69	27	65	-46	38	99	-79	43	66	-82
Bus 3W	Westbound	-22	120	77	-16	145	76	-12	105	62	2	62	37	-11	87	65
Bus 4N	Northbound	26	25	127	17	21	45	-	-	-	26	12	62	-	-	-
Bus 4S	Southbound	-3	40	31	14	7	93	-	-	-	8	56	249	-	-	-
Bus 5N	Northbound	8	0	18	7	0	37	14	-1	33	8	0	42	6	-1	52
Bus 5S	Southbound	3	-3	13	4	0	4	0	1	1	6	4	11	-10	0	-3
Bus 6N	Northbound	4	9	115	15	15	51	17	25	92	3	21	141	12	26	108
Bus 6S	Southbound	2	1	16	3	1	15	2	1	26	2	1	23	1	1	9
Bus 7E	Eastbound	13	10	22	26	15	40	12	17	36	5	24	41	16	15	44
Bus 7W	Westbound	-3	16	-3	-4	3	-1	-2	7	-2	-5	41	1	1	3	4
Bus 8S	Southbound	1	25	5	4	13	3	4	4	7	-2	28	-1	1	14	2
Bus 8N	Northbound	40	9	26	89	24	-23	22	35	-27	35	11	2	0	50	-7



Table 5-8 2028-48 Change in Bus Average Travel Time (seconds)

		2028-2048 Changes														
		NZUP + A1			NZUP + A1 + Stanley Closed			NZUP + Art12			NZUP + Art12 + Stanley Closed			NZUP + Art123 + Stanley Closed		
Bus Route		AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour	AM Peak Hour	Interpeak Hour	PM Peak Hour
Bus 1E	Eastbound	5	26	13	-	-	-	6	18	49	16	-43	11	-1	-9	18
Bus 1W	Westbound	4	-4	0	-	-	-	0	1	17	-3	2	1	-10	-7	42
Bus 2N	Northbound	21	4	18	-	-	-	5	10	8	-6	-4	-1	-20	9	23
Bus 2S	Southbound	181	177	22	-	-	-	-20	85	84	-11	37	-16	36	16	9
Bus 3E	Eastbound	-3	101	770	-	-	-	20	66	931	-14	144	757	-11	243	883
Bus 3W	Westbound	28	49	-39	-	-	-	31	19	-20	26	100	18	43	66	-2
Bus 4N	Northbound	73	971	334	-	-	-	-	-	-	-	-	-	-	-	-
Bus 4S	Southbound	102	1003	223	-	-	-	-	-	-	-	-	-	-	-	-
Bus 5N	Northbound	9	132	120	-	-	-	9	94	265	25	113	47	21	130	164
Bus 5S	Southbound	0	3	125	-	-	-	7	-7	208	1	2	91	4	4	223
Bus 6N	Northbound	49	818	238	-	-	-	29	645	197	88	718	156	27	657	173
Bus 6S	Southbound	5	111	200	-	-	-	2	102	156	15	100	99	4	132	503
Bus 7E	Eastbound	25	21	-8	-	-	-	35	30	18	19	21	-5	29	33	-9
Bus 7W	Westbound	-7	-18	364	-	-	-	3	-8	320	4	-40	335	-1	-3	466
Bus 8S	Southbound	1	-26	225	-	-	-	2	1	115	5	-25	135	3	-9	104
Bus 8N	Northbound	61	85	0	-	-	-	71	90	18	48	53	17	133	19	30

Table 5-8 shows that there are significant increases in average bus travel times anticipated by 2048.

However:

- Increases in travel time on sections 1, 2 and 3 (those in and out of Queenstown) are relatively low and consistent between scenarios. This demonstrates that in the most part the Town Centre network is operating satisfactorily and that bus travel times are protected from delay in the wider network. The removal of general traffic (either partially or fully) helps the reliability in travel times, with the exception of eastbound PM peak travel times along SH6A, but as explained in earlier sections, this can be remedied by biasing green time allocation at the critical SH6/SH6A intersection
- In Frankton, in 2048 the network performance starts to break down, as shown in Figure 5-20. Despite the provision of bus lanes infrastructure, there are some gaps where significant delay is experienced by buses (albeit, generally less than general traffic delay):
 - Westbound journeys from Shotover Bridge to Frankton bus hub (section 7W) in the PM peak period. Delay is experienced between Shotover Bridge and the start of the westbound bus lane at Hardware Lane. Due to bus lanes provided upstream on Ladies Mile, traffic would likely be held back at this upstream point to ensure buses can experience a largely free-flow journey to the Hardware Lane bus lane. But as this is outside the model boundary, this could not be represented, so the bus delay output from the model would not be experienced in practice
 - Northbound journeys from Remarkables Park to the Airport (and Airport to Lucas Place). In 2048 this section of the network becomes very congested. **It is recommended that a northbound bus lane on Lucas Place (Riverside Road roundabout to Airport roundabout) is considered for implementation beyond 2028.** This would also aid outbound services running from Remarkables Park Town Centre towards the Kawarau Falls Bridge (via the proposed Humphrey Street link)
 - Northbound journeys from Kawarau Falls Bridge to the Remarkables Park Town Centre. In 2048 this section of the network becomes very congested. All northbound services moving directly along SH6 to the bus hub and those using the Humphrey Street link to run to Remarkables Park Town Centre would experience this congestion, as there is no means to gate traffic entering the Frankton network from the south (i.e. over Kawarau Falls Bridge). **It is recommended that northbound bus priority lanes (and complimentary measures) are considered for implementation south of the Kawarau Falls Bridge beyond 2028. This would include priority lanes to serve the proposed Park and Ride site in the vicinity of Boyd Road.**

6. Conclusions

The Stantec / WSP / Abley team have been commissioned to provide project specific models to inform the range of business cases underway in Queenstown and the surrounding area. This report has set out the scenarios tested the final set of options requested by the Queenstown Town Centre Detailed Business Case and Frankton to Queenstown Single Stage Business Case project team.

The results show:

- In Queenstown Town Centre:
 - Stage 1 of the Arterial provides benefits in terms of operational performance and resilience to the network and helps to facilitate the removal of traffic from less desirable routes (such as Camp Street and Hallenstein Street).
 - The closure of the western end of Stanley Street (to general traffic) provides a satisfactory Level of Service within the network and removes traffic from this key PT link within the Town Centre. The bus travel times for scenarios with and without Stanley Street closed are relatively similar. The delay savings brought by removing bus interactions with general traffic, are balanced against more delay experienced at traffic signals (less green time as dedicated bus movements) albeit some dynamic adaptive signal priority could reduce bus delay.
 - The addition of Stage 2 of the Arterial provides some additional benefits in terms of Town Centre operation although these are modest.
 - The addition of Stage 3 of the Arterial provides some additional performance benefits, allowing the removal of some traffic from Shotover Street and Lake Esplanade.
- On Frankton Road (SH6A):
 - Operation is satisfactory along SH6A in both directions. Westbound, the improvements in the Town Centre combined with the NZUP package delivering a greater PT mode share, ensure that all traffic can be accommodated at intermediate intersections. Greater control is also provided throughout the network, and the SH6/SH6A and SH6 Frankton signalised intersections will ensure that the level of traffic is gated at the entry point to SH6A, with any excess demand held within Frankton, where bus priority lanes can bypass any such queues.
 - The signalised intersections also provide benefits in terms of vehicular access onto SH6A (safer egress from side roads) and pedestrian safety due to the provision of protected crossings adjacent to bus stops and other intersections.
- In Frankton:
 - Operation up to 2028 is generally acceptable within Frankton, but by 2048 severe congestion is expected. This demonstrates the importance of maximising PT mode share, as well as encouraging a higher active travel trip proportion.
 - The signalising of all key intersections along SH6 in Frankton ("bridge to bridge") provides more control on the network and allows any peaks and troughs of demand to be better managed.
 - The introduction of bus lanes along both sections of SH6 provide benefits in terms of bus travel times, particularly beyond 2028 when congestion is expected to continue to increase. However, given the expected increase in land use to the south of Kawarau Falls Bridge (particularly residential, but also industrial/commercial), it is recommended that additional bus lanes are provided beyond 2028 on:
 - Lucas Place northbound, between Riverside Road roundabout and the Airport roundabout.
 - Northbound SH6 south of the bridge, to protect buses approaching Frankton Flats from the south, potentially tying into a Park and Ride site on this corridor.

It should be noted that since the models were developed as reported here, some alterations have been made to proposals in Frankton, particularly at the SH6/SH6A intersection. However, these alternative layouts are likely to improve the operation in this area of the network (for both general traffic and buses) and therefore the results presented in this report should be considered robust.

Appendices



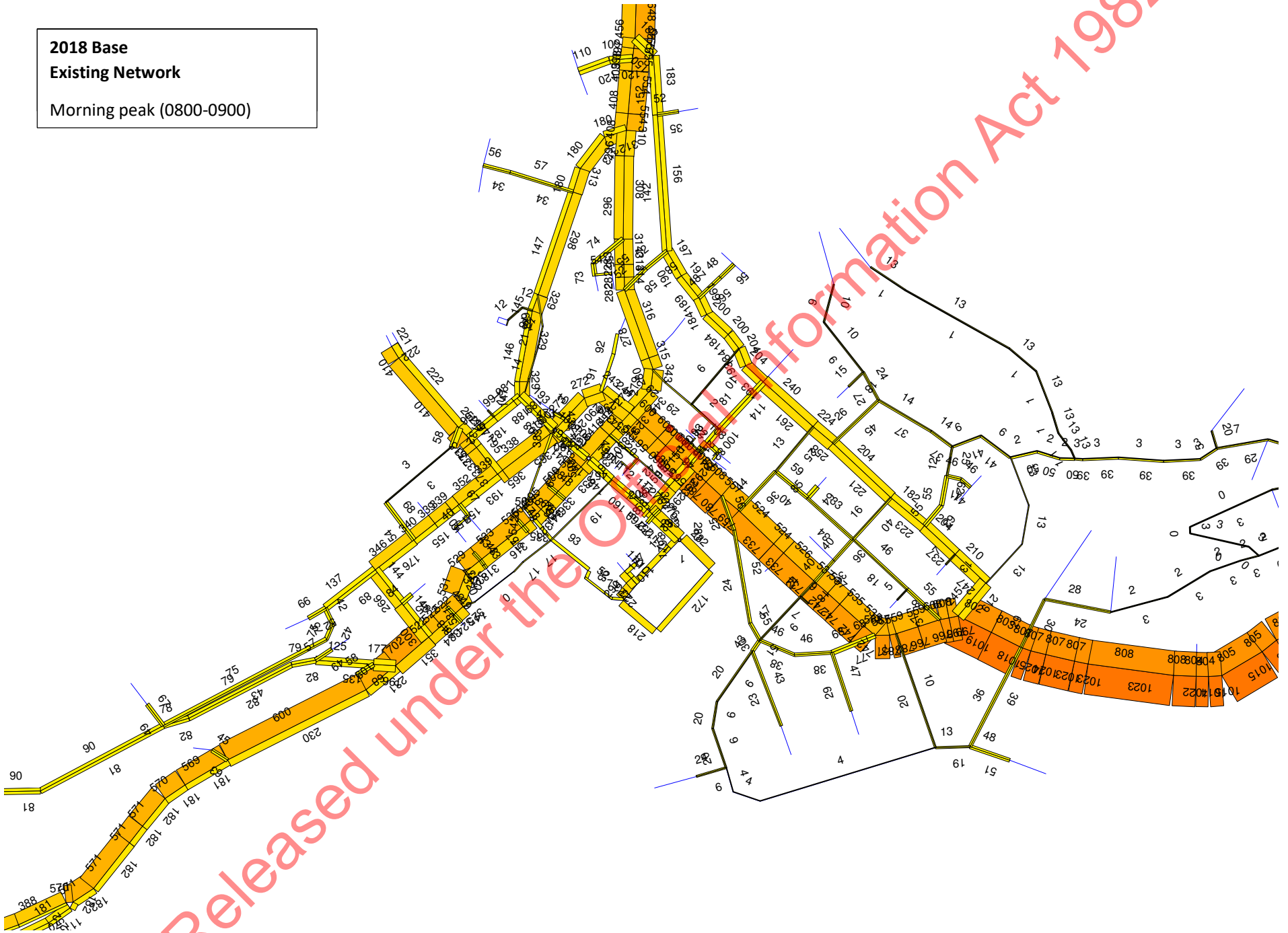
Appendix A Traffic Volume Plots

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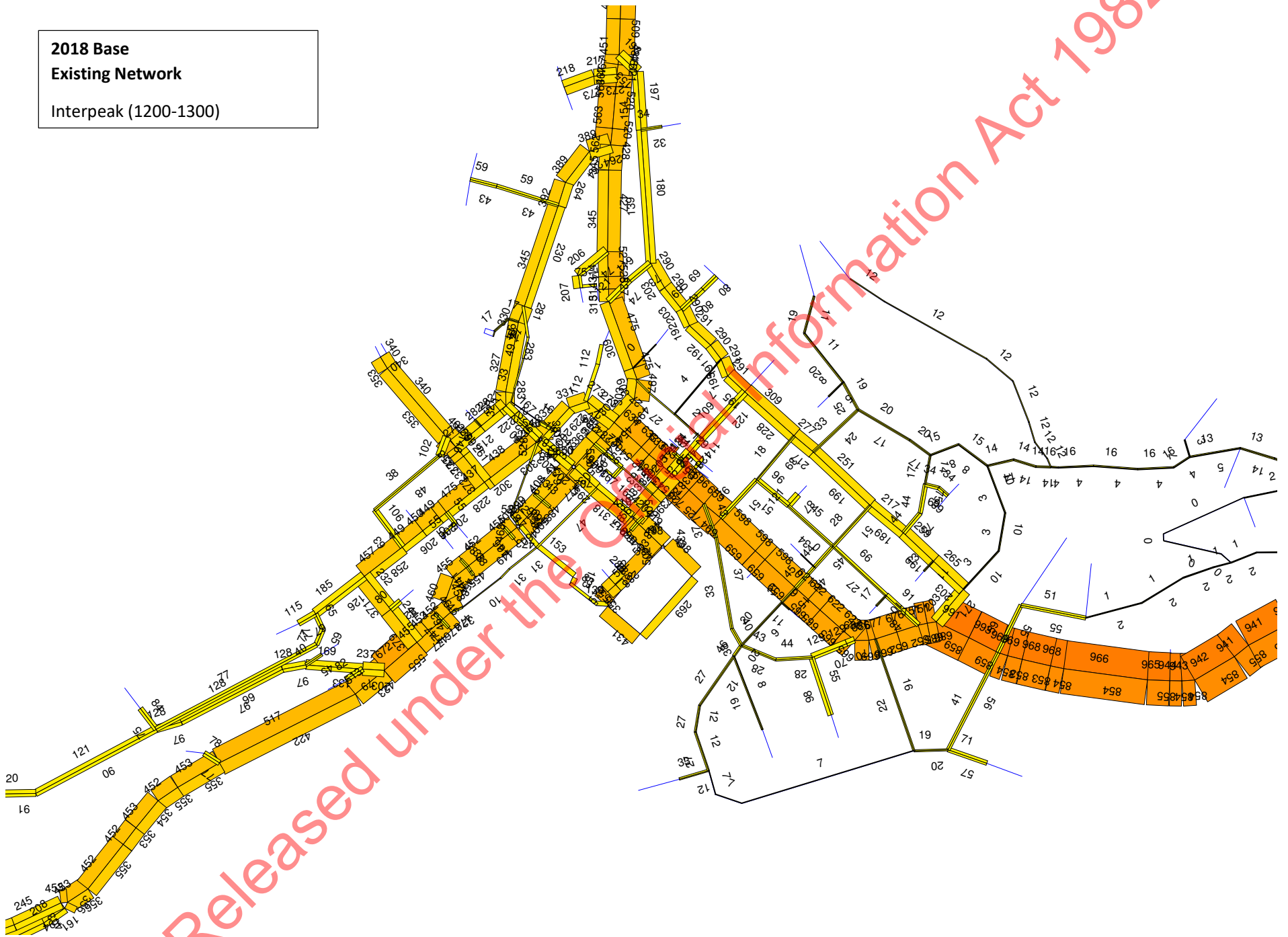
2018 Base

Existing Network

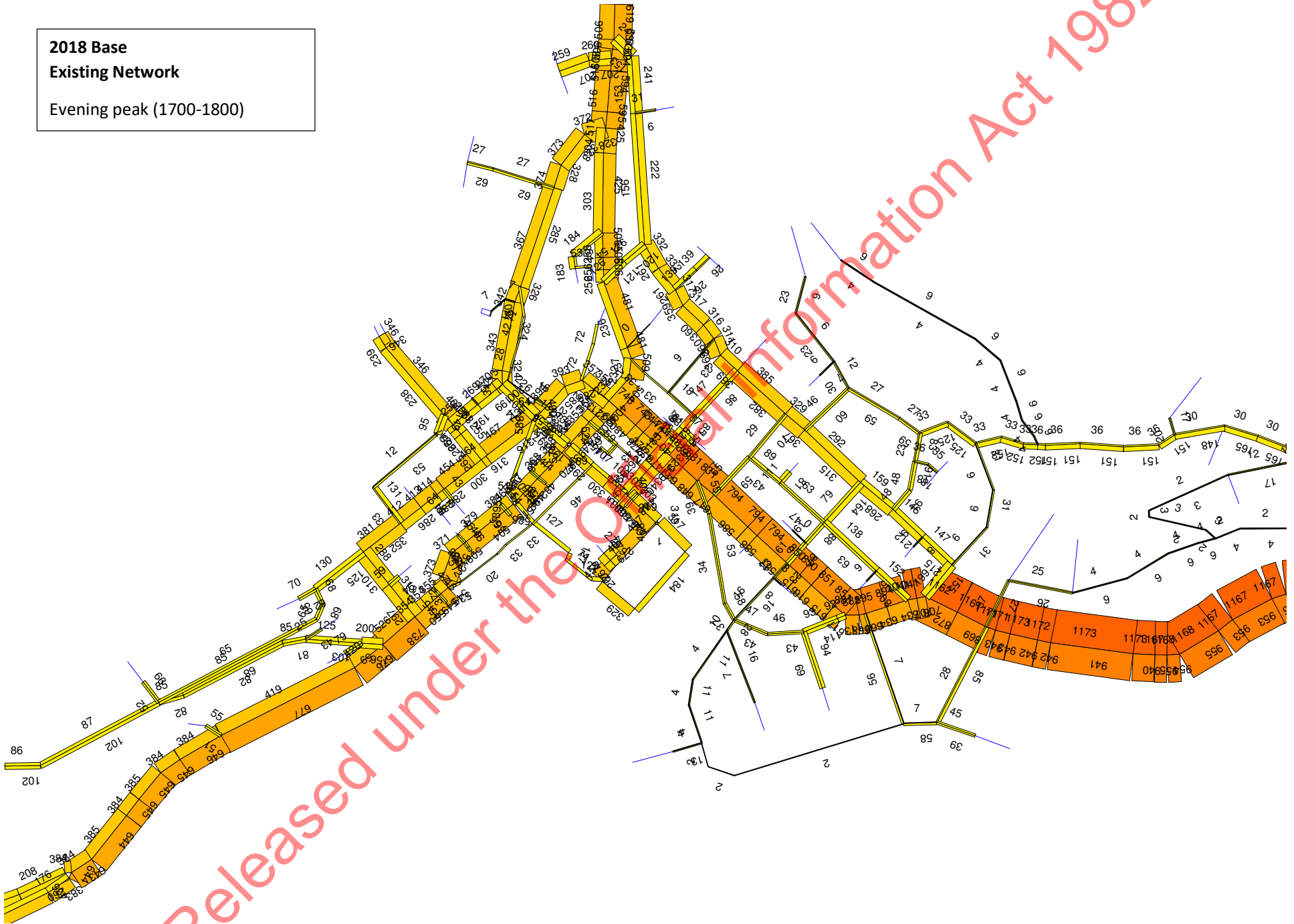
Morning peak (0800-0900)



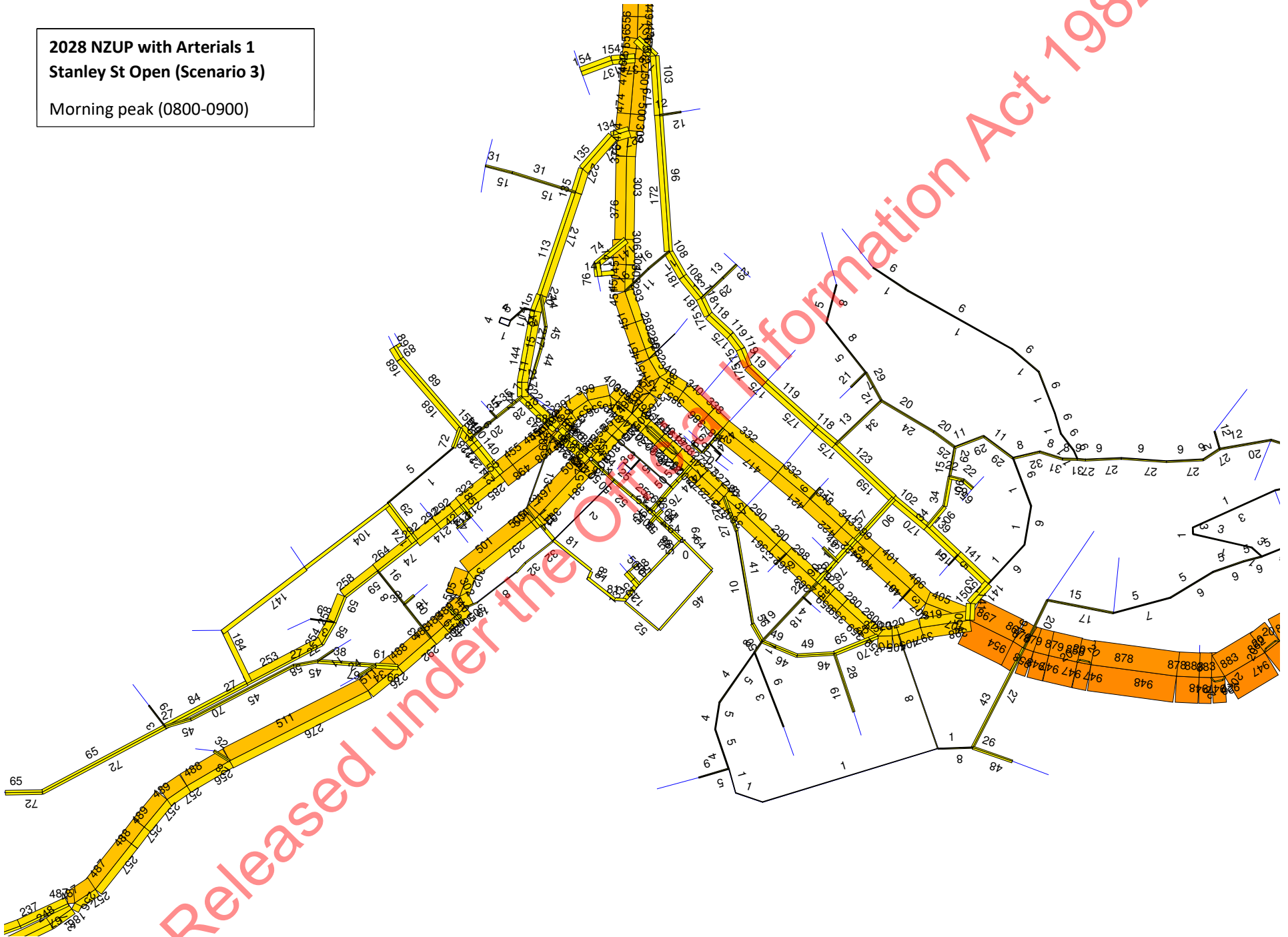
2018 Base
Existing Network
Interpeak (1200-1300)



Evening peak (1700-1800)

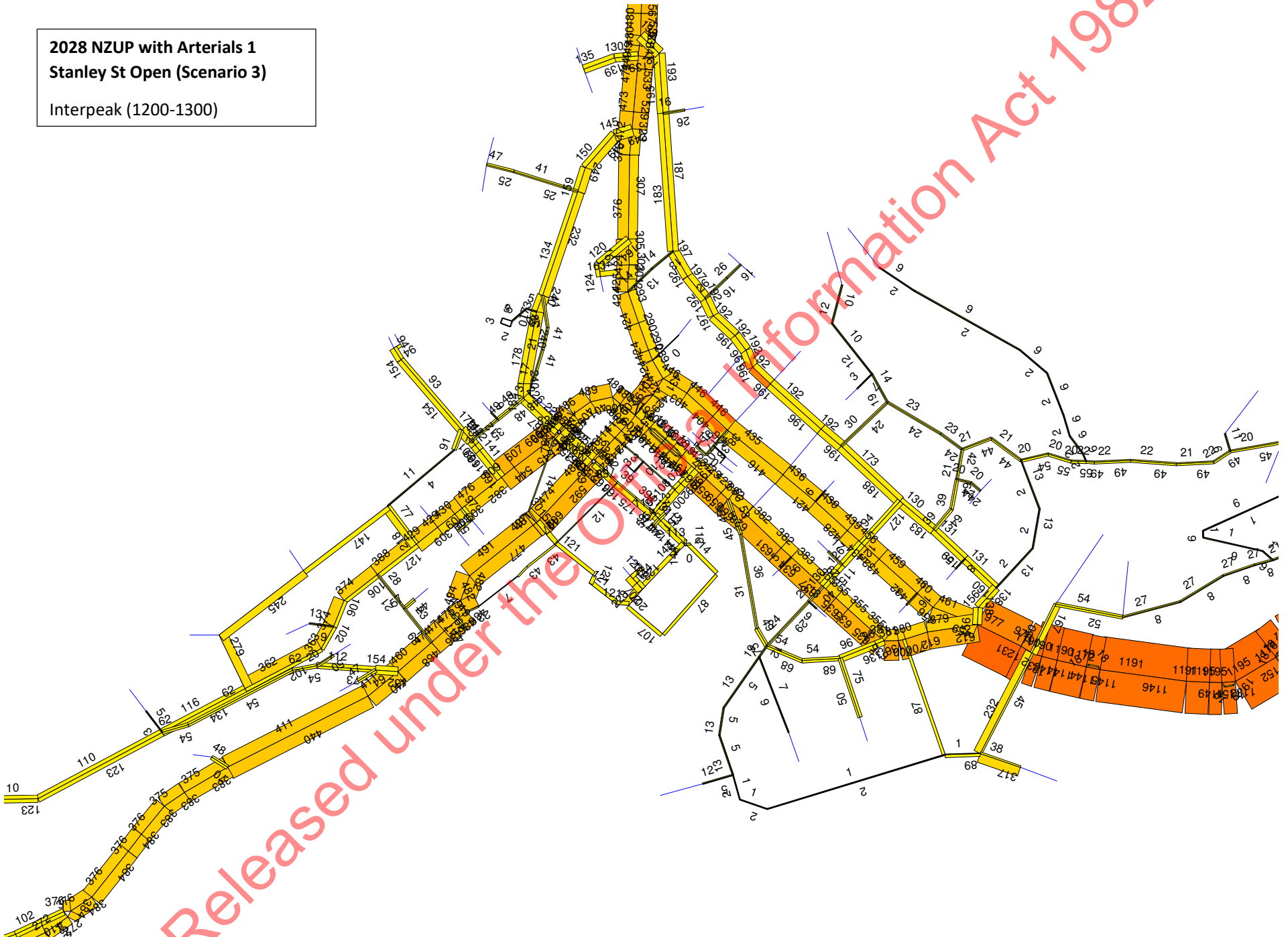


2028 NZUP with Arterials 1
Stanley St Open (Scenario 3)
Morning peak (0800-0900)

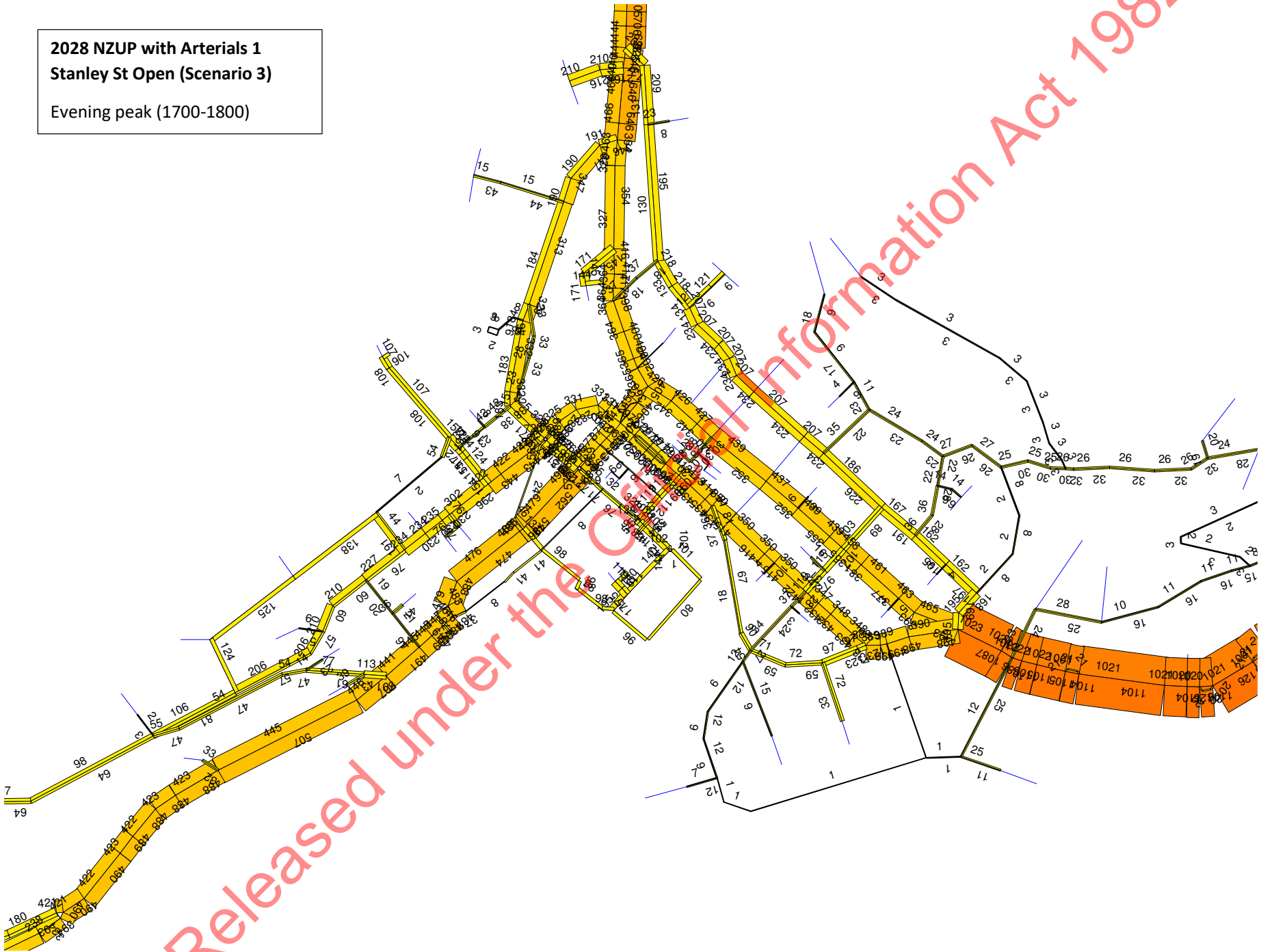


2028 NZUP with Arterials 1
Stanley St Open (Scenario 3)

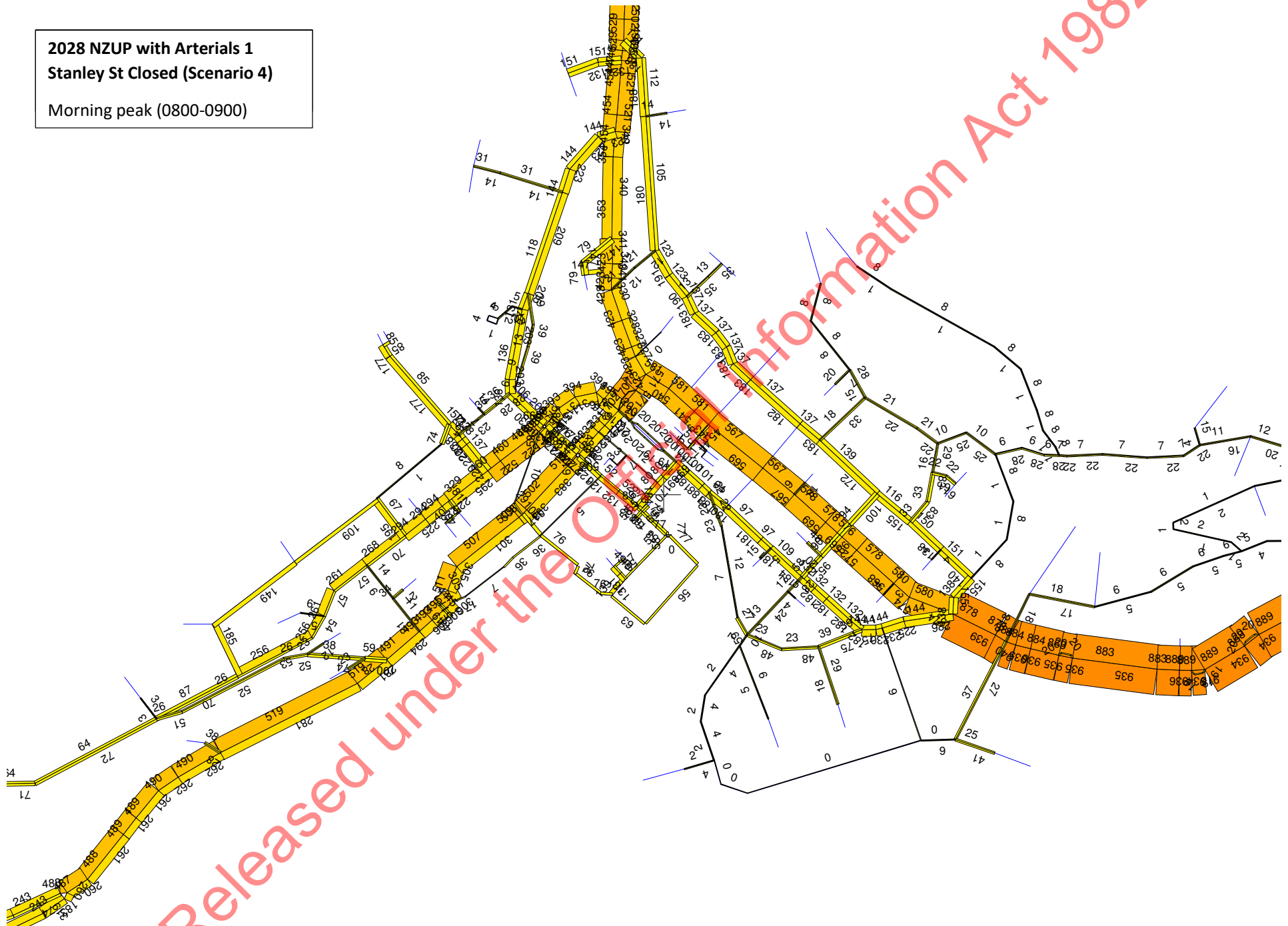
Interpeak (1200-1300)



2028 NZUP with Arterials 1
Stanley St Open (Scenario 3)
Evening peak (1700-1800)

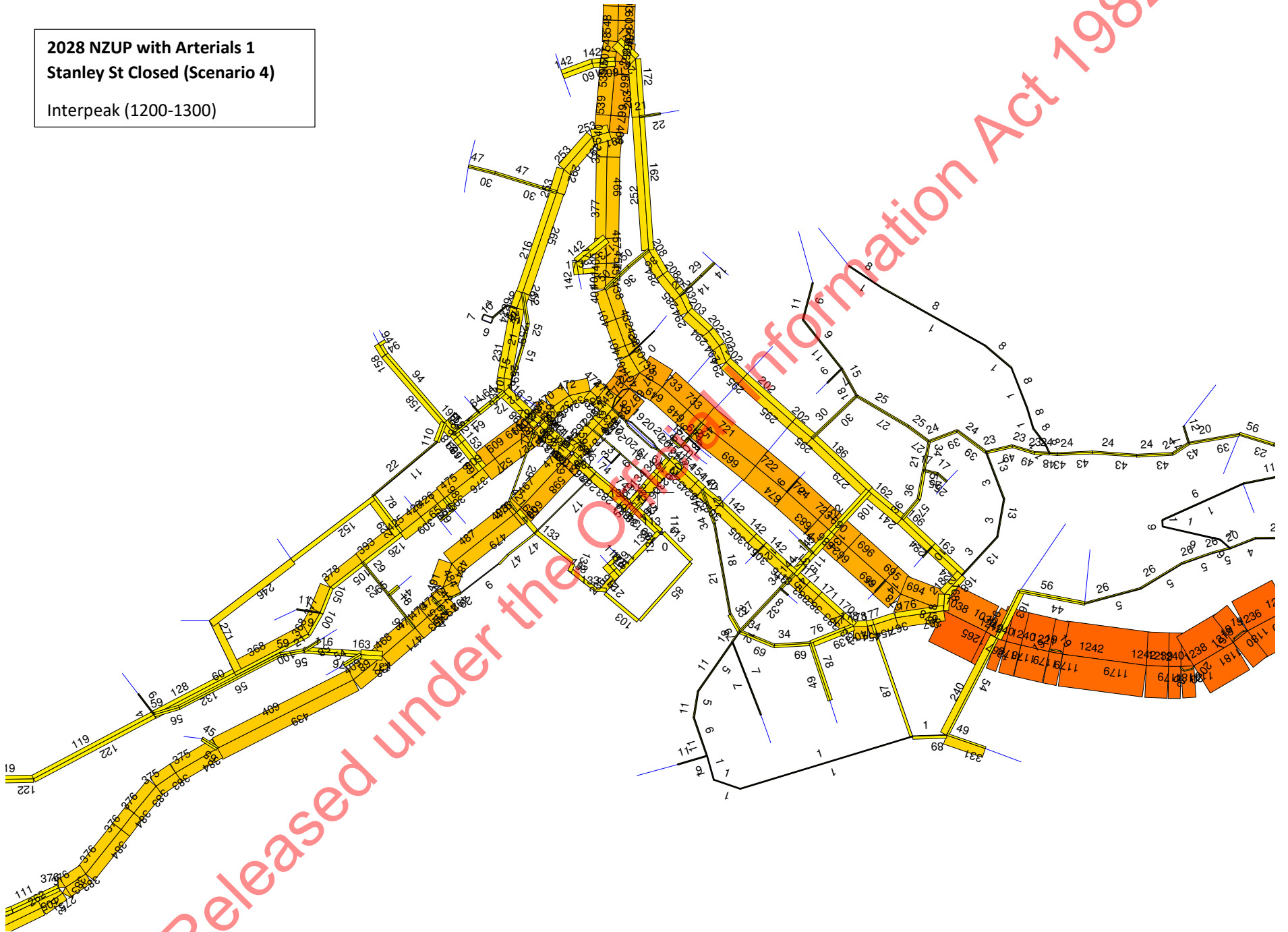


Morning peak (0800-0900)



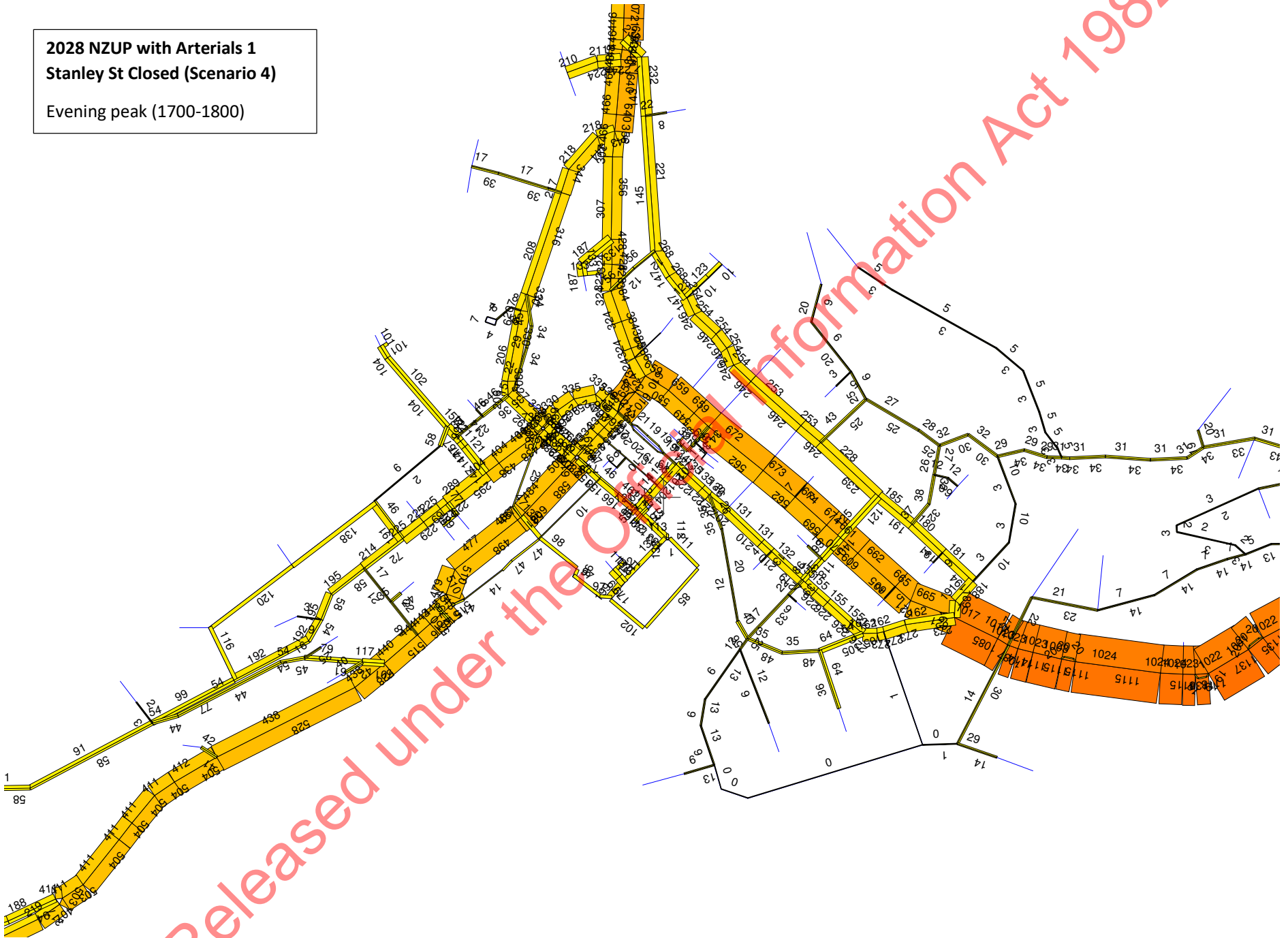
2028 NZUP with Arterials 1
Stanley St Closed (Scenario 4)

Interpeak (1200-1300)



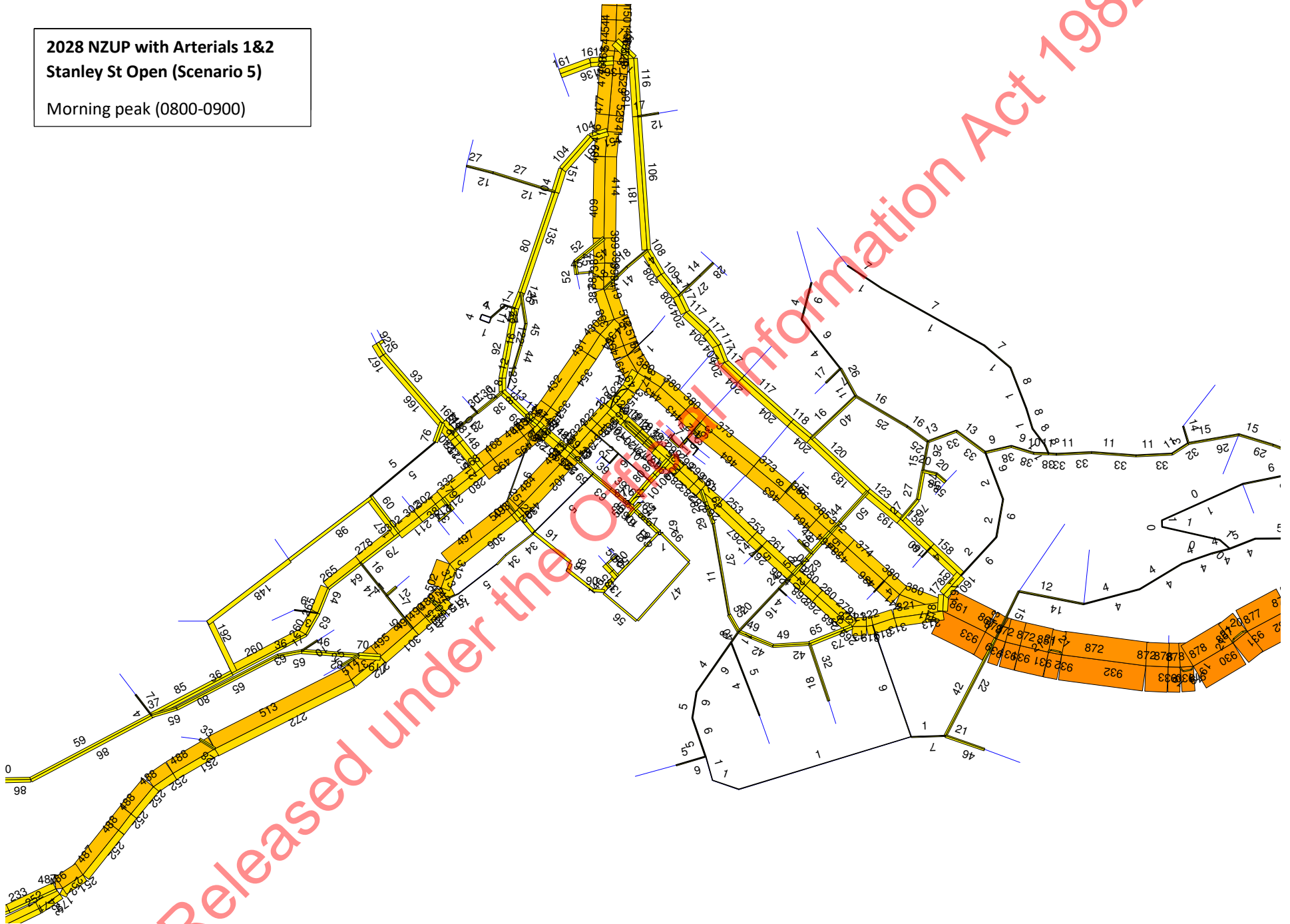
2028 NZUP with Arterials 1
Stanley St Closed (Scenario 4)

Evening peak (1700-1800)



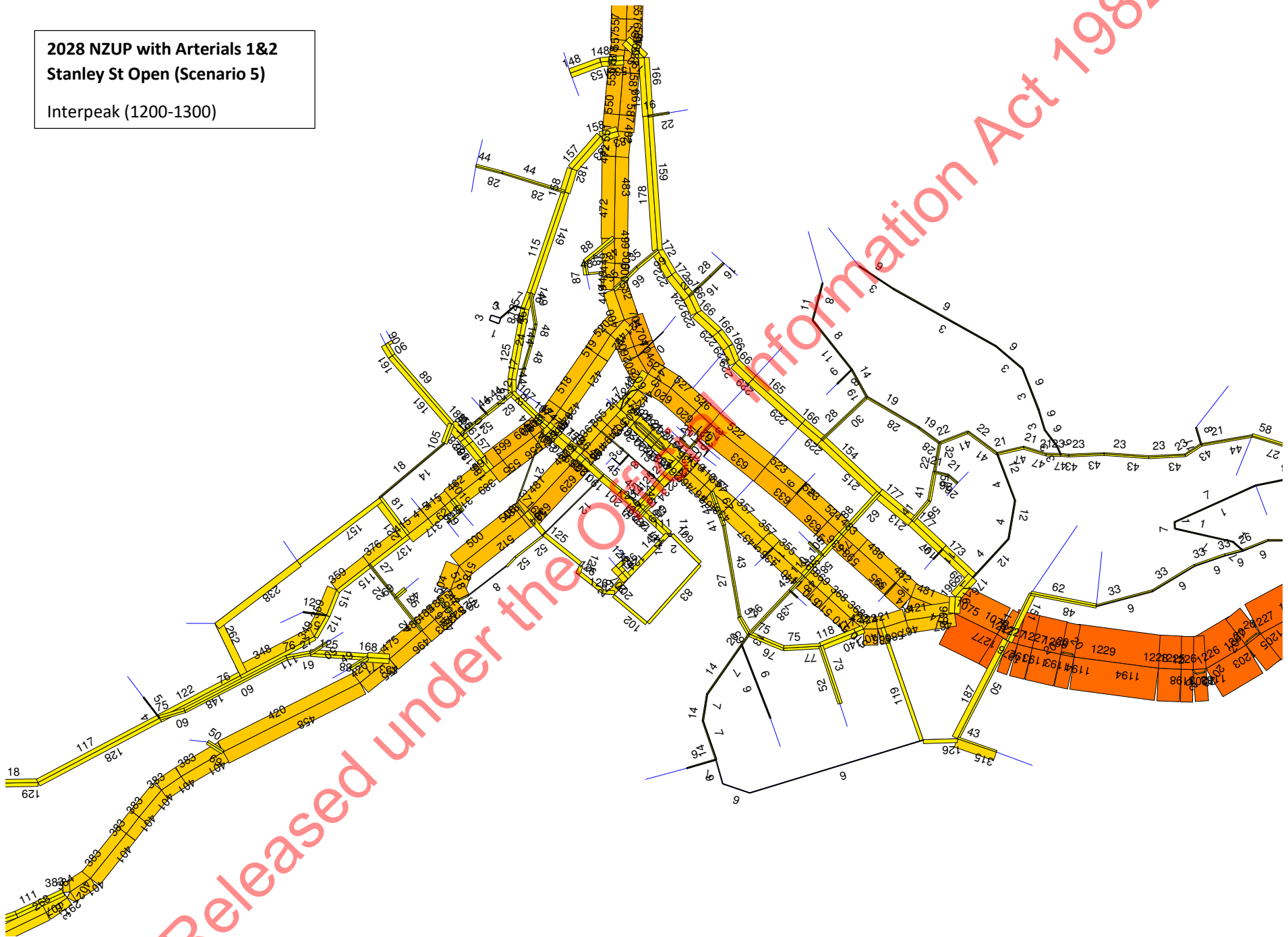
2028 NZUP with Arterials 1&2
Stanley St Open (Scenario 5)

Morning peak (0800-0900)



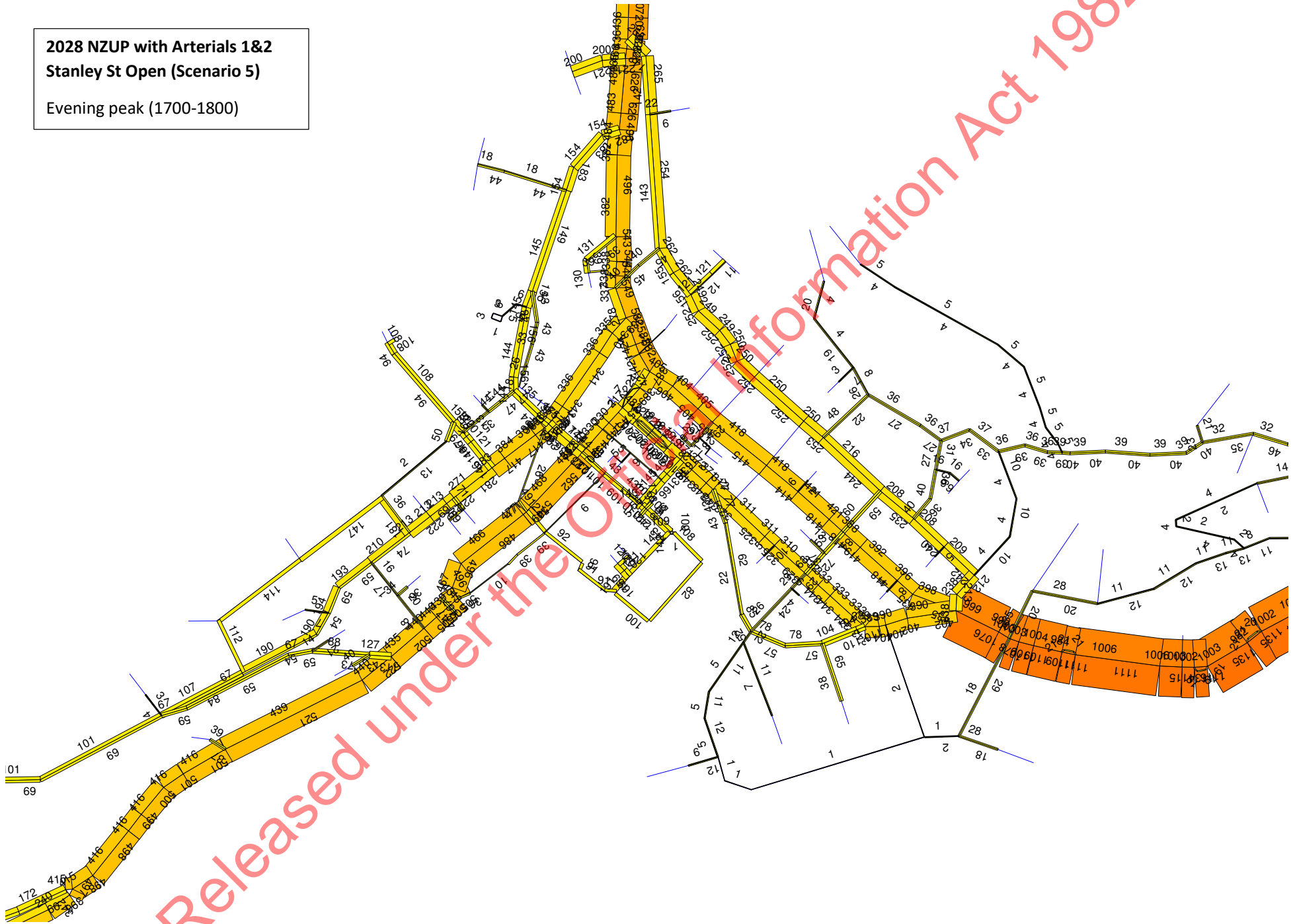
2028 NZUP with Arterials 1&2
Stanley St Open (Scenario 5)

Interpeak (1200-1300)



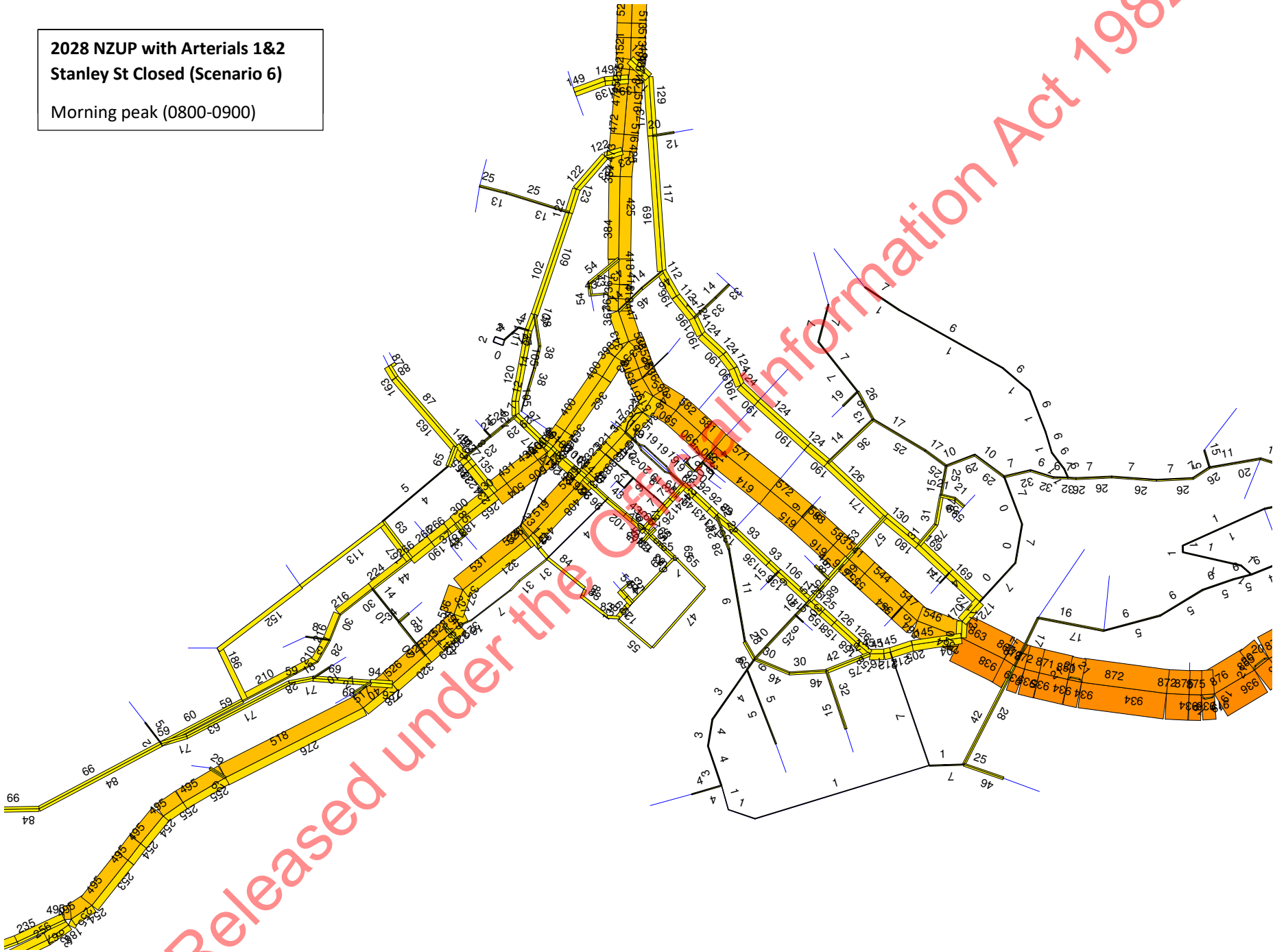
**2028 NZUP with Arterials 1&2
Stanley St Open (Scenario 5)**

Evening peak (1700-1800)



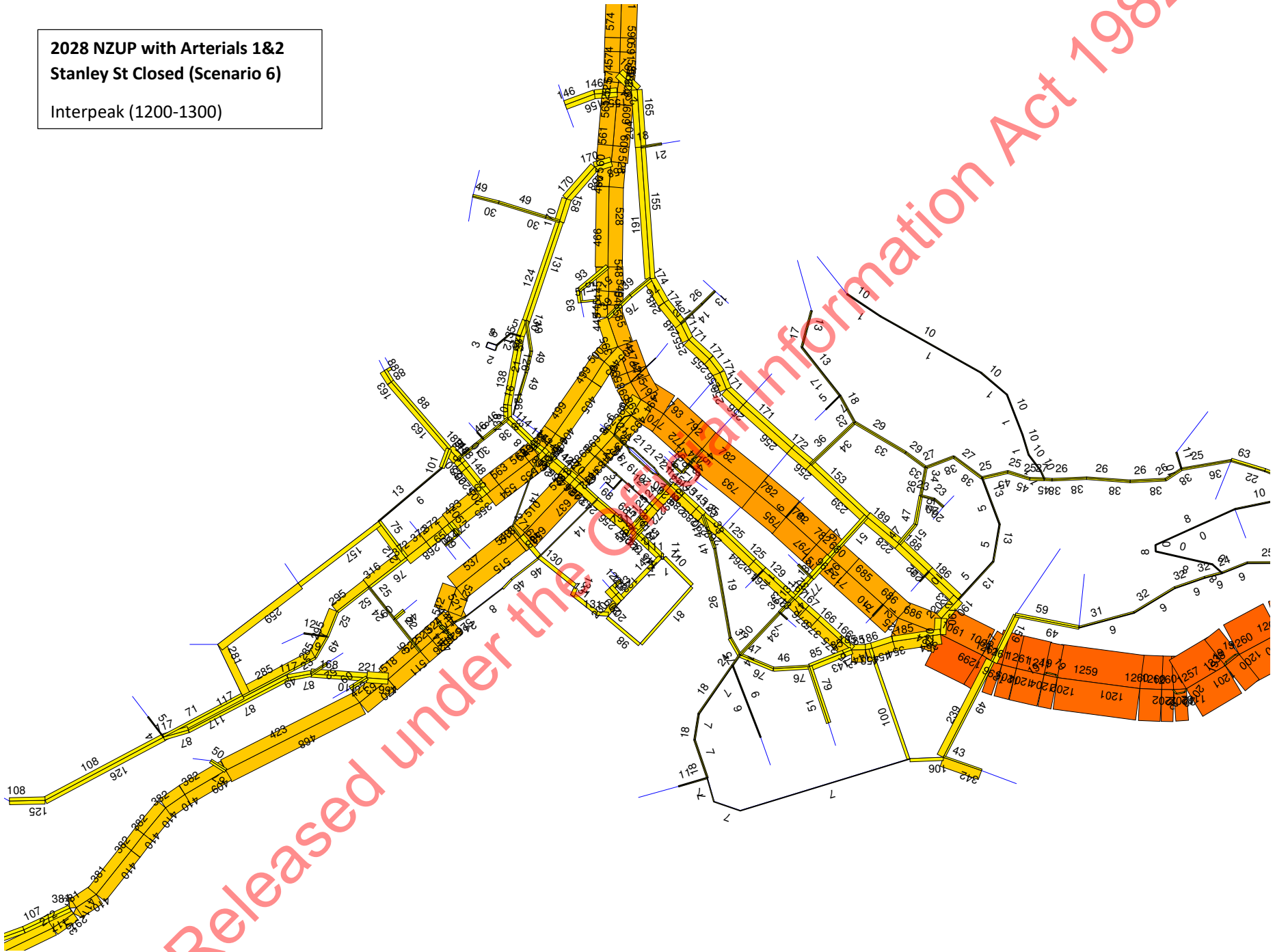
2028 NZUP with Arterials 1&2
Stanley St Closed (Scenario 6)

Morning peak (0800-0900)



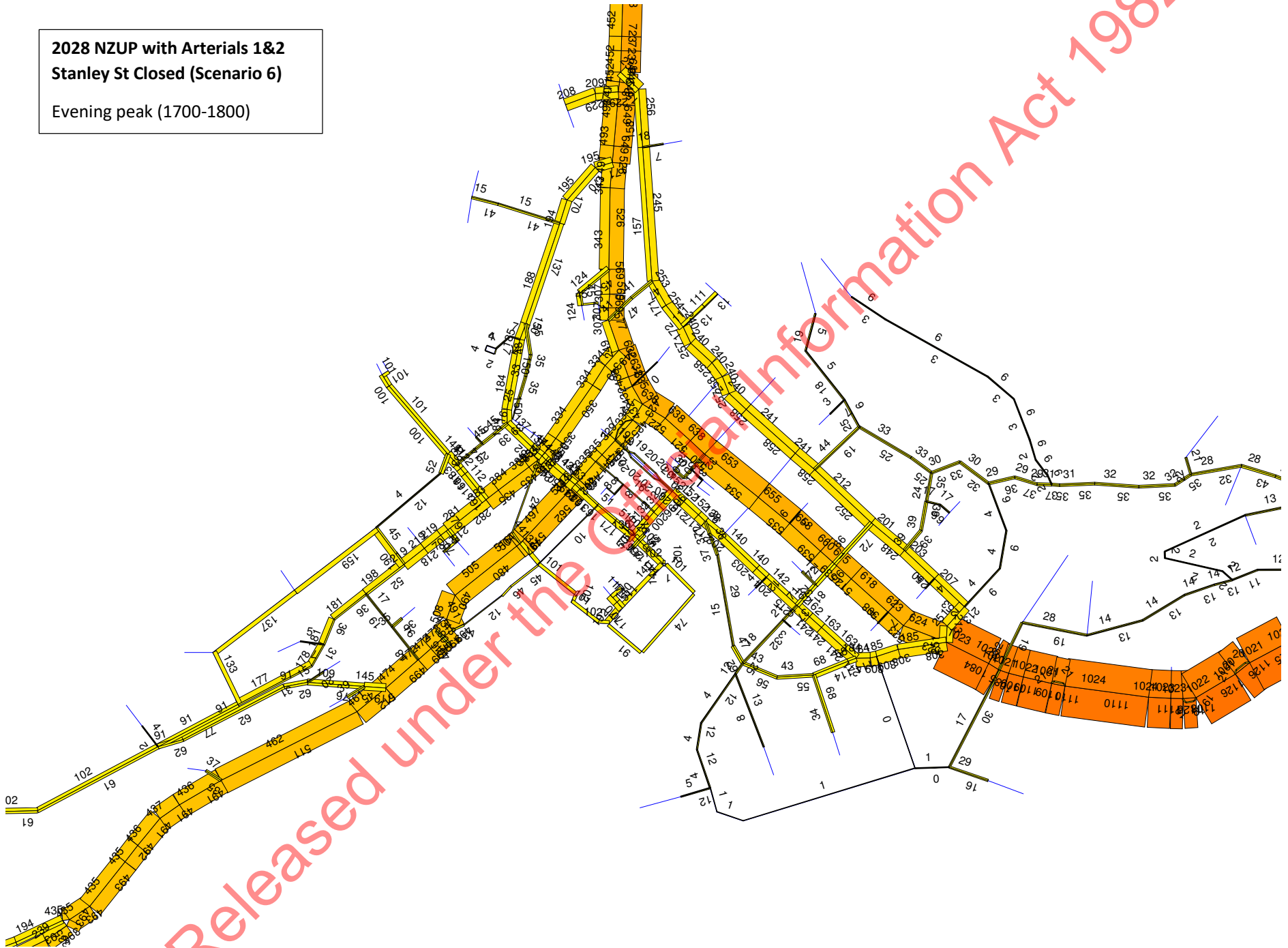
**2028 NZUP with Arterials 1&2
Stanley St Closed (Scenario 6)**

Interpeak (1200-1300)



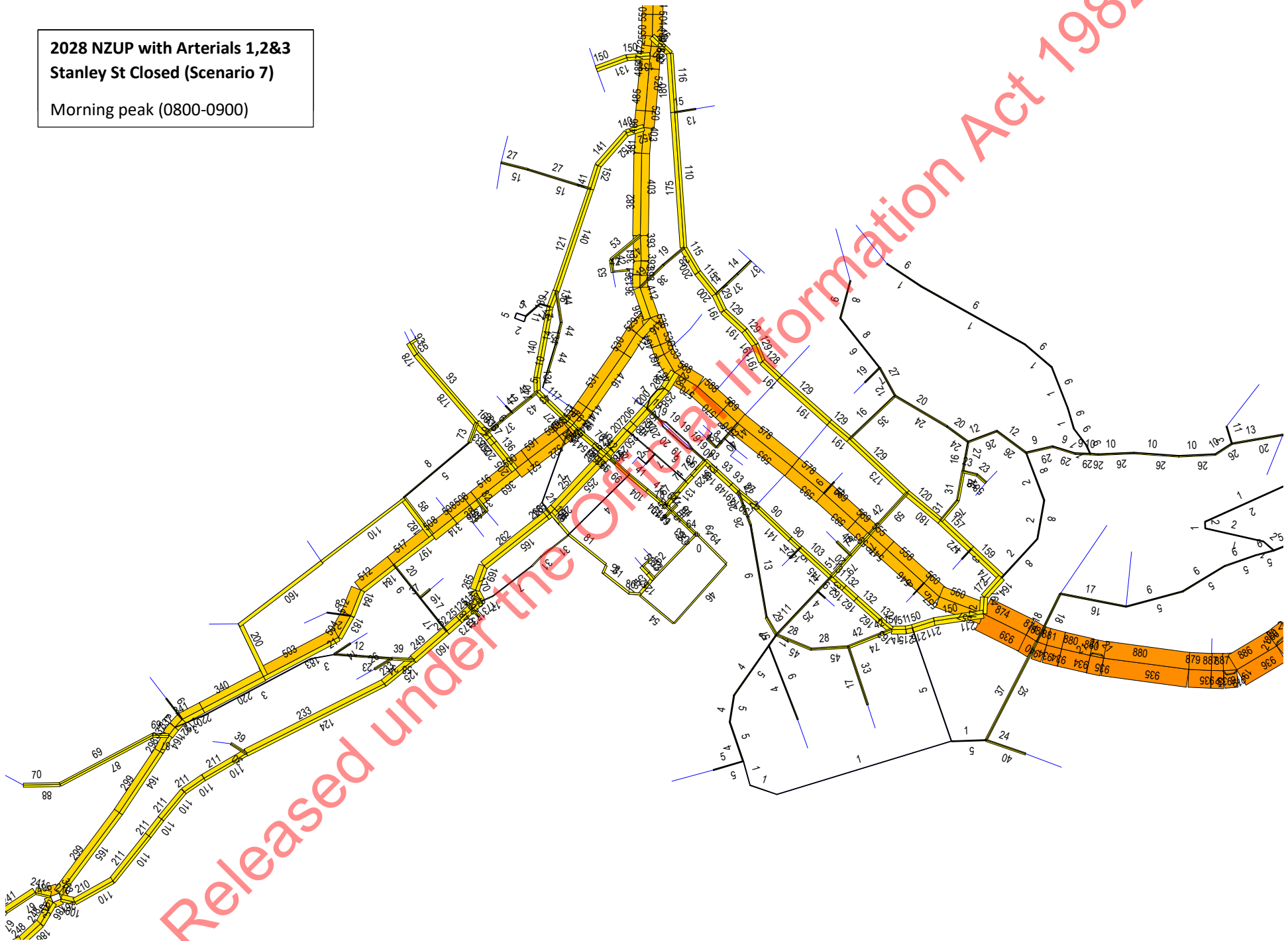
2028 NZUP with Arterials 1&2
Stanley St Closed (Scenario 6)

Evening peak (1700-1800)



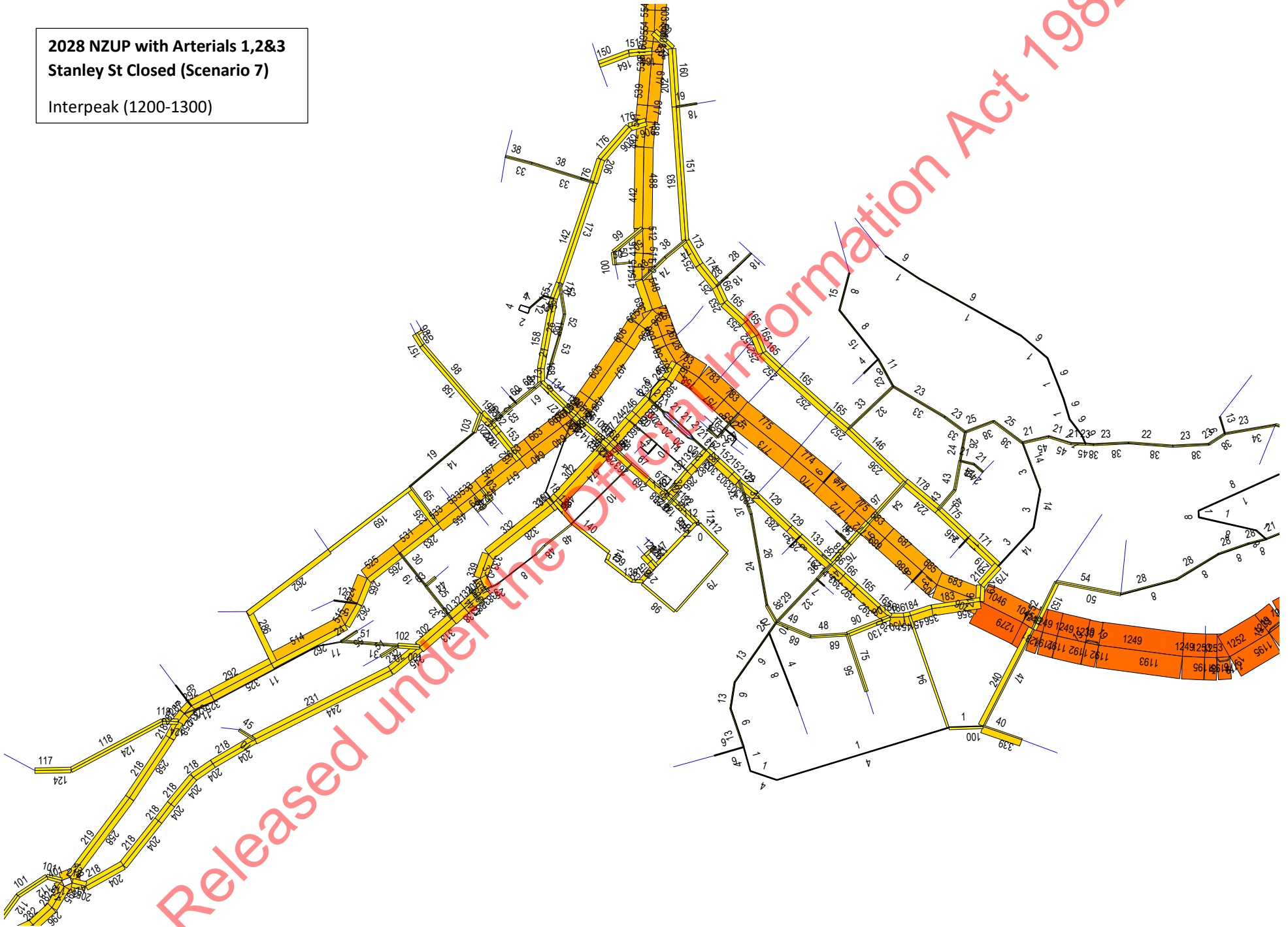
2028 NZUP with Arterials 1,2&3
Stanley St Closed (Scenario 7)

Morning peak (0800-0900)



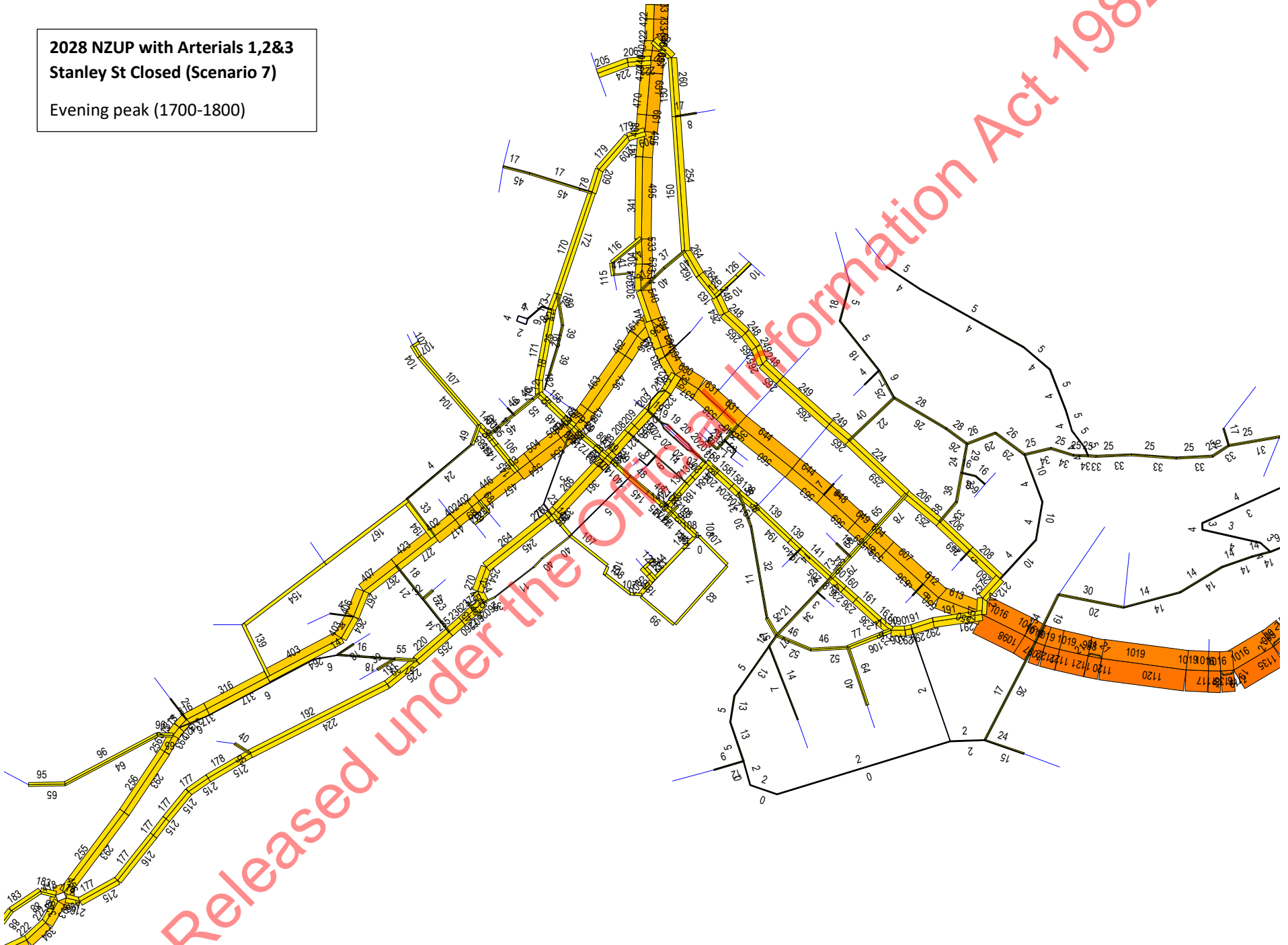
2028 NZUP with Arterials 1,2&3
Stanley St Closed (Scenario 7)

Interpeak (1200-1300)



2028 NZUP with Arterials 1,2&3
Stanley St Closed (Scenario 7)

Evening peak (1700-1800)



Appendix B Scenario Assumptions

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Activity/Location	Package/Intervention	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7
Bus assumptions	Bus Do Min	✓	✓	✗	✗	✗	✗	✗
	Bus Max	✗	✗	✓	✓	✓	✓	✓
Demand assumptions	Existing QTC parking rates (2018)	✓	✓	✓	✓	✓	✓	✓
	Calculated 2028 parking rates	✗	✗	✗	✗	✗	✗	✗
	Calculated 2048 parking rates	✗	✗	✗	✗	✗	✗	✗
Bus lanes	None	✓	✓	✗	✗	✗	✗	✗
	Bus lane from Suburb to Coronation	✗	✗	✗	✗	✗	✗	✗
	Coronation Drive bus priority (into Stanley St)	✗	✗	✓	✗	✗	✗	✗
	NB bus lane Lucas Place to Frankton Hub	✗	✗	✓	✓	✓	✓	✓
	EB/WB Bus lanes BP to Hardware Lane	✗	✗	✓	✓	✓	✓	✓
	WB bus lane Howards Drive to Stalker Road	✗	✗	✓	✓	✓	✓	✓
	NB bus lanes Kingston Road (if required)	✗	✗	✓	✓	✓	✓	✓
SH6A	As existing	✗	✗	✗	✗	✗	✗	✗
	Signals at Marina, Goldfields, Hensman	✓	✓	✗	✗	✗	✗	✗
	All signalised intersections (as per NZUP package)	✗	✗	✓	✓	✓	✓	✓
	Virtual Priority	✗	✗	✓	✓	✓	✓	✓
Frankton	As existing	✓	✓	✗	✗	✗	✗	✗
	Traffic Management in Old Frankton	✗	✗	✓	✓	✓	✓	✓
	Humphrey Street link (through to Lucas Place)	✓	✓	✓	✓	✓	✓	✓
	Signals at Humphrey/Lucas	✓	✓	✓	✓	✓	✓	✓
	Frankton Hub (existing)	✓	✓	✗	✗	✗	✗	✗
	Frankton Hub (interim)	✗	✗	✓	✓	✓	✓	✓
	Signals at Frankton Hub (interim)	✗	✗	✓	✓	✓	✓	✓
	SH Signalised at Lucas Place, BP, JOC, Grant, Hawthorne	✗	✗	✓	✓	✓	✓	✓
Other	Park and Ride at Howards Drive	✗	✗	✓	✓	✓	✓	✓
	Park and Ride at Boyd Road	✗	✗	✓	✓	✓	✓	✓
	Edith Cavell bridge duplication	✗	✗	✗	✗	✗	✗	✗
Ladies Mile	As Existing	✓	✓	✗	✗	✗	✗	✗
	Howards Drive Roundabout	✗	✗	✓	✓	✓	✓	✓
	SH6 Westbound bus lanes	✗	✗	✓	✓	✓	✓	✓
QTC Intersections	Signals at Man/Hay	✗	✗	✗	✗	✓	✓	✓
	Signals at Brecon/Man	✗	✓	✓	✓	✓	✓	✓
	Signals at Shotover/Rees	✓	✓	✓	✓	✓	✓	✓
	Signals at Man/Camp	✗	✗	✗	✗	✓	✓	✓
	Signals at Shotover/Camp	✗	✗	✗	✗	✓	✓	✓
	Signals at Lake Esplanade/Beach	✓	✓	✓	✓	✓	✓	✓
	Signals at Stanley/Sydney	✗	✗	✗	✗	✗	✗	✗
	Signals at Melbourne/Sydney	✗	✗	✗	✗	✓	✓	✓
	Signals at Stanley/Coronation (east)	✗	✗	✗	✗	✗	✗	✗
	Signals at Melbourne/Dublin/Frankton	✓	✓	✓	✓	✓	✓	✓
	Barnes Dance at Stanley/Shotover (at least)	✓	✓	✓	✓	✓	✓	✓
	Barnes Dance at Stanley/Ballarat (at least)	✓	✓	✓	✓	✓	✓	✓
	Signals at Gorge/Henry	✓	✓	✓	✓	✓	✓	✓
	Signals at Gorge/Arterial Stage 2	✗	✗	✗	✗	✓	✓	✓
	Midblock on Stanley Street (as part of transit mall)	✗	✓	✗	✓	✗	✓	✗
	Close Ballarat Street (North) at Stanley/Ballarat (Manawa)	✓	✓	✓	✓	✓	✓	✓
	Closure of NB Ballarat Street (Camp to Athol)	✗	✗	✗	✗	✗	✗	✗
	Signals at Gorge/Hallenstein	✗	✗	✗	✗	✗	✗	✗
	Signals at Gorge/Robins	✗	✗	✗	✗	✗	✗	✗
	Gorge Road SB Bus Lane	✗	✗	✗	✗	✗	✗	✗
	Lake Esplanade EB Bus lane	✗	✗	✗	✗	✗	✗	✗
Hallenstein	Existing	✓	✓	✓	✓	✓	✓	✓
	Upgraded	✗	✗	✗	✗	✗	✗	✗
Lakeview	One way system	✓	✓	✓	✓	✓	✓	✓
Arterials	Arterial Stage 1 Network	✓	✓	✓	✓	✗	✗	✗
	Arterial Stages 1, 2 Network	✗	✗	✗	✗	✓	✓	✗
	Arterial Stages 1, 2, 3 Network	✗	✗	✗	✗	✗	✗	✓
	Stanley St closed (for bus hub)	✗	✓	✗	✓	✗	✓	✓

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**Queenstown Lakes District Model:
Business Case Modelling Report**

**Queenstown Lakes District Council / Waka Kotahi
NZ Transport Agency**



Queenstown Lakes District Model: Business Case Modelling Report

Queenstown Lakes District Council / Waka Kotahi
NZ Transport Agency

Quality Assurance Information

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Job Number: NZTA-J116
Prepared by: s 9(2)(a) Senior Transport Engineer
Reviewed by: s 9(2)(a) Technical Director – Transportation Planning

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		Name
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1. Introduction

The Queenstown Lakes District Tracks Transportation Model has been applied for the assessment of future growth scenarios and inputs into various Business Case and Masterplan work to support transportation planning in the Queenstown-Lakes District, as well as to assess the future spatial plan and inform the demands of a combined Queenstown and Frankton s-Paramics Model.

This report accompanies two prior reports as follows:

- QLDC Tracks Model - 2018 Base Model Setup, July 2018 – Technical Note reporting the findings of an interim update of the model base year to 2018 via interpolation.
- Queenstown Lakes District Model 2018 Update: Future Forecasting Report, November 2019 – Technical report summarising the development of future year models of 2028 and 2048.

Between November 2019 and August 2020 several iterations of modelling have been undertaken to support the Queenstown Town Centre Detailed Business Case and Frankton to Queenstown Single Stage Business Case. The strategic modelling has been integrated with a bespoke public transport model (described in the Future Forecasting Report) to ensure that mode shift is reflected within the model as is appropriate to each model scenario. The public transport skims passed back to the Tracks model from the PT model are removed from the vehicle driver matrix prior to any assessment work and prior to extracting a demand matrix for the s-Paramics model. A final set of modelled scenarios following this same process were delivered in July and August 2020.

This report summarises the final set of modelling assessment to support the business cases and prepared by Abley. The modelled scenario specifications are documented, and model outputs reported in full. This includes traffic volume change plots, travel totals and economic analysis. The business case delivery team also source modelling deliverables from the Paramics model which provides a more detailed assessment of intersection performance including delays, level of service and travel time.

2. Modelled scenario specifications

This report documents the results of the final eight modelling scenarios as follows:

Table 2.1 Modelled Scenarios

Scenario		Description
0	Do Minimum without Arterials	Agreed Do-Minimum network (Scenario 1) without Arterial Stage 1
1	Do Minimum	Existing (2020) network plus Arterial Stage 1 and other committed infrastructure reported in Appendix A of Queenstown Lakes District Model 2018 Update: Future Forecasting Report, November 2019. This includes most notably: • Signals at SH6A/Sugar Lane • Roundabout at SH6/Howards Drive • SH6/Tuckers Beach Road grade separation (opened recently) • Quail Rise to Hawthorne Drive link • Humphrey Street link with signals at SH6 Humphrey and Humphrey/Lucas • Frankton bus hub • Signals at Brecon/Man, Shotover/Rees, Lake Esplanade/Beach, Melbourne/Dublin/Frankton, Gorge/Henry • Inclusion of Barnes Dance for pedestrians at all signals • Closure of Ballarat Street north of Stanley as part of Project Manawa • Additional roading links as per Lakeview structure plan
2	Do Minimum + Stanley Closed	Scenario 1 plus Stanley Street closed (for bus hub)
3	NZUP + A1	Bus lane on: • Lucas Place to Frankton Hub (northbound) • BP to Hardware Lane (eastbound and westbound) • Howards Drive to Stalker Road (westbound) • Kingston Road (northbound -if required) Signalised all SH6A intersections as per NZUP package plus virtual priority Traffic management in Old Frankton Signals at Frankton Hub (interim) Signalised SH6 intersection at SH6A, Lucas Place, Joe OConnell Drive, Grant Road, Hawthorne Drive. Park and ride at Howards Drive and Boyd Road Roundabout at SH6/Howards Drive intersection SH6 westbound bus lanes Arterial Stage 1
4	NZUP + A1 + Stanley Closed	Scenario 3 plus Stanley Street closed (for bus hub)
5	NZUP + Art12	Scenario 3 plus Arterial Stage 1 and 2
6	NZUP + Art12 + Stanley Closed	Scenario 5 plus Stanley Street closed (for bus hub)
7	NZUP + Art123 + Stanley Closed	Scenario 6 plus Arterial Stage 3.

3. Model outputs

The following outputs are included in this report and have been used to inform the current suite of business case work:

- Strategic Model All Day Traffic Flows for Scenario 1 as shown in Appendix A
- All Day traffic flow change of each Scenario (0 and 2 to 7) to Scenario 1 as shown in Appendix A
- Modelled Transport Economics including VKT, VMT and Network Operating Costs as shown in Appendix B
- Annualised Benefit summary as shown in Section 4.2.

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4. Travel totals and transport economics

4.1 Traffic flows

A summary of average annual daily traffic (AADT) traffic flows for each scenario is provided for Scenario 1 (the do minimum) for 2018, 2028 and 2048 as shown in Appendix A. Following this the relative change in AADT flow for each of the other scenarios compared to Scenario 1 is also provided in Appendix A. In the remainder of this subsection is a description of the flow and flow changes for the general Queenstown Town Centre area.

Scenario 1

On the eastern side of the Town Centre the modelled two-way traffic volumes are around 26,300 vehicles per day (vpd) in 2018 increasing to 34,300vpd in 2028 and then 35,700 in 2048. The alternative route to SH6A on Queenstown hill carries around 5,500vpd in 2018 increasing to 8,400vpd in 2028 and then 8,700 in 2048. In future years, the proportion of Queenstown hill traffic increases slightly compared to the 2018 year.

On the western side of the Town Centre the modelled two-way traffic volumes are around 16,100vpd in 2018 increasing to 17,700vpd in 2028 and then minimal change to 2048. A higher proportion of traffic is on Lake Esplanade in the order of 60 to 70%.

On Gorge Road to the north of Hallenstein Street the modelled two-way traffic volumes are around 11,100vpd in 2018 increasing to 13,500vpd in 2028 and then increasing to 17,100vpd to 2048.

Scenario 0

Without Arterial stage 1 the volumes on the parallel route increases mostly on Stanley Street but some rerouting occurs on Hallenstein Street and also on the hill route to Hensman Road. These patterns are evident in all modelled years.

Scenario 2

The closure of Stanley Street to general traffic at the Bus Hub diverts traffic onto the Stage 1 Arterial and Camp Street. The scale of increases on these roads are modest as Stanley Street in the vicinity of the proposed bus hub only has a modelled flow in the do minimum of 1000-3000vpd when Arterial Stage 1 is constructed. Flow changes on other corridors are in the order of 300 to 900vpd in a singular direction with the greatest changes occurring in 2048.

Scenario 3

In Scenario 3 the higher PT share delivered through the NZUP package is evident in the change in traffic flows as the network layout is very similar to Scenario 1 in the town centre. The most prominent change is on the eastern side of the Town Centre the modelled two-way traffic volumes decreasing by around 1,700vpd in 2018, 5,700vpd in 2028 and 5,000 in 2048. The effects of this decrease are mainly felt on the alternative route to SH6A on Queenstown hill.

On the western side of town, the two-way decreases are between 1000vpd and 1,300vpd while to the north decreases are between 350vpd and 1,500vpd. The change in flow entering the town centre changes the intersection operation and routing. Changes along Frankton Road are small as this route is generally operating at capacity and it is the rat-running along Queenstown hill caused by the saturated flow on SH6A which is removed.

Scenario 4

As with Scenario 2 the closure of Stanley Street (this time combined with the mode shift due to the NZUP package) to general traffic at the Bus Hub diverts traffic onto the Stage 1 arterial and Camp Street. The change due to the higher PT share is more evenly spread between SH6a and the hill route for this scenario however as the traffic that has diverted to the arterial can access the hill route more easily.

Scenario 5

Scenario 5 brings in Stage 2 of the Arterials and removes the connectivity to Man Street from the end of Stanley Street whilst keeping Stanley Street open to general traffic in the vicinity of the proposed bus hub. The traffic flow change is

reflective of these network changes as traffic switches from Stanley Street to the Arterials and switches from Robins Road to Gorge Road. The patterns are evident across all the modelled years along with the underlying reductions in traffic from higher PT share.

Scenario 6

In Scenario 5 there was a large shift from Stanley Street to the Arterials so closing Stanley Street in Scenario 6 does not induce much more change and the flow change patterns are quite similar to Scenario 5.

Scenario 7

With the Arterial 3 stage linking the Man Street Corridor to the Fernhill Roundabout there is quite a large shift in traffic from Lake Esplanade to Man Street via Arterial 3. This also strengthens the Man Street corridor as a through route from the Fernside Roundabout as there is an increase in traffic utilising the Arterial 2 link compared to Scenario 6 as well as further decreases on Shotover Street. The two-way flow change on Lake Esplanade is in the order of 6,000vpd, 6,500vpd and 7,300vpd in 2018, 2028 and 2048 respectively.

General comments

The key east-west routes in the town centre being the Arterial Stage 1, Stanley Street and Camp Street are all coded to have operating speeds in the vicinity of 20 kph (Camp Street) through 40 kph (Arterials) as specified by the business case team. The grid structure of the road network in this vicinity combined with relatively coarse representation of intersection delays within the strategic model means that the flows in the town centre are in some cases sensitive to small changes in delays. This results in some trends where there are higher flows in one direction than the other on these corridors and rat-running (such as high use of Camp Street) occurs within the model.

These limitations of the strategic model are acknowledged and the business case team have been directed to the s-Paramics microsimulation model for a more fine-grained and operational based assessment of the town centre network. The s-Paramics model more accurately reflects the level of interaction between adjacent intersections including signal coordination, more dynamic signal green time allocation and the impacts of queuing back through intersections and access ways. For this reason, the business case team defer to the s-Paramics model for a representation of Level of service and delays at each intersection in the town centre and this is reported separately.

4.2 Transport economics

The Queenstown Lakes District Tracks Transportation Model has been used to establish the relative transport benefits of each scenario including most notably the individual Arterial stages. This is done by extracting the network operating costs of the base and option networks for each comparison and subtracting the base values from the option to reveal the change in network operating cost. The period models for one year are factored based on the equivalent number of periods that occur in one year to establish an annual transport network operation for that year.

The full economic summary tables are shown in Appendix B and summarised as annualised benefits for the specified scenarios in [Table 4.1](#).

Table 4.1 Annualised Transportation Benefits

Year	Sc1 vs Sc0	Sc3 vs Sc1	Sc4 vs Sc2	Sc5 vs Sc3	Sc6 vs Sc4	Sc7 vs Sc6
Corresponds to benefits of:	Arterial Stage 1	NZUP with Stanley St open	NZUP with Stanley St closed	Arterial Stage 2 with Stanley St open	Arterial Stage 2 with Stanley St closed	Arterial Stage 3 with Stanley closed
2018	\$1,257,858	\$8,794,545	\$6,852,828	-\$2,214,212	\$1,076,475	-\$677,993
2028	\$834,089	\$34,046,072	\$34,934,402	\$672,146	\$349,041	\$544,297
2048	\$509,915	\$35,092,723	\$34,175,661	\$448,051	\$2,250,264	\$932,789

Note that these are undiscounted totals and have been calculated based on Waka Kotahi NZ Transport Agency Economic Evaluation Manual (EEM) procedures at July 2019 cost values. The modelled crash cost savings included have been normalised by inferring calibration factors for links and intersections based on reported Queenstown accidents from 2009 to 2019 within the Waka Kotahi Crash Analysis System (CAS).

The results in **Table 4.1** show that most elements of the proposed packages produce transport network operating benefits going forwards. Introducing Stage 2 with Stanley street open and the Stage 3 arterial test shows some disbenefit in 2018, however the two future years for these scenarios produce network benefits.

4.3 Spatial plan sensitivity test

Alongside the Business Case work Queenstown-Lakes District Council and Waka Kotahi have been investigating future land use development across the District in the long term by forming a Spatial Plan. While the updated land use forecasts from the Spatial Plan were not available to inform the final forecasts for the modelling underpinning the Business Case, a sensitivity test has been undertaken with the preferred Spatial Plan growth forecasts following the delivery of the eight options documented in this report. The land use forecasts included two 2048 scenarios which have been run through the model as follows:

- Preferred spatial plan forecast – includes the same quantum of residential, commercial and tourist activity growth as the base forecasts but with a different spatial distribution of growth. Most notably this includes more development in the vicinity of Jacks Point
- Post Covid forecast – identical to the preferred spatial plan in terms of the spatial distribution of growth but includes a reduced level of tourist activity in line with post-covid forecasts issued by Utility consultants.

The preferred spatial plan scenario is understood to combine elements of previous Main Centre and Connected Settlements scenarios that were tested in the spatial plan process and a summary of residential growth changes from the future base models presented in 'Queenstown Lakes District Model 2018 Update: Future Forecasting Report' which are consistent with the forecasts for the scenarios presented earlier in this report, are shown below.

- Increases in households in southern corridor offset in part by lower growth at Kelvin Heights (net increase of +360HH) and small increases along eastern corridor (+140HH) and Arrowtown/Arthurs Point (+275HH).
- Decreases in residential development in Frankton urban area (-590HH).
- Increased growth in Wanaka township (+235HH) with a shift to less growth in the north and more in the west, and a reduction in households in the outlying Wanaka area (-360HH).

The changes in employment growth from the baseline are more pronounced and are as follows:

- Increases in jobs in southern corridor (net increase of +1760 jobs) and Frankton urban area (+1060 jobs).
- Decreases in employment in Queenstown urban area (-2580 jobs) and east of Shotover River (-200 jobs).
- Increased job growth in Wanaka township (+1000 jobs) with 1000 fewer jobs in outlying areas of the Wanaka ward.

AADT volume plots and volume change plots for each of the two tests are included in **Appendix C**.

This preferred spatial plan sensitivity test was also used to see the effect of the new Spatial Plan land use distribution and forecast on the economics of the NZUP Package (scenario 3 compared to the do minimum scenario 1). A summary of the economics is included at the end of **Appendix B**.

Under the spatial plan scenario there are around 10-15% more benefits in the future year models prior to the discounting process. The total net present value benefits increase from \$382m to \$431m resulting in a 13% uplift in benefits for the NZUP package. This is largely due to the consolidation of growth in the main urban areas which are well serviced by public transport and other infrastructure investment.

Note that this analysis includes increased public transport service provision on the SH6 southern corridor (that is the same service frequency has been assumed as that on the eastern corridor) as the Spatial Plan has higher growth forecasts around Jacks Point, therefore there would be a small increase in costs associated with the revised spatial plan scenario. Overall, the sensitivity test indicates that the benefits within the economics of the Business Case work would increase under the preferred Spatial Plan forecasts.

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5. Summary and conclusions

This report has been prepared to summarise the assumptions and outputs of the Queenstown-Lakes District Tracks Transportation Model for the assessment of future growth scenarios and inputs into various Business Case and masterplan work in the District. The model has been used to determine the transport economics for the Queenstown Town Centre Detailed Business Case and Frankton to Queenstown Single Stage Business Case.

The final set of options includes eight scenarios run at 2018, 2028 and 2048, ranging from do-minimum scenarios to staged implementation of the Queenstown Town Centre arterials with and without closure of Stanley Street to enable a town centre bus hub.

The traffic flow analysis demonstrates how traffic patterns will change compared to the do-minimum networks that includes the first stage of the arterials. The closure of Stanley Street for the bus hub when there is only Stage 1 of the arterials shows rerouting of traffic to the arterial and Camp Street. Upon implementing the NZUP package and inducing greater mode shift to public transport there is a reasonable drop in traffic entering/leaving the town centre from all directions but more dominant from the east. With Arterial Stage 2 in place the arterials become the main route for entering the town centre and the lakeside area with traffic shifting from Stanley Street. There is less change in traffic flows associated with closing Stanley Street when the Stage 2 Arterial is already in place. Finally, the third stage of the Arterials provides relief for the Shotover Street corridor which see Lake Esplanade reduce in traffic by around 50%.

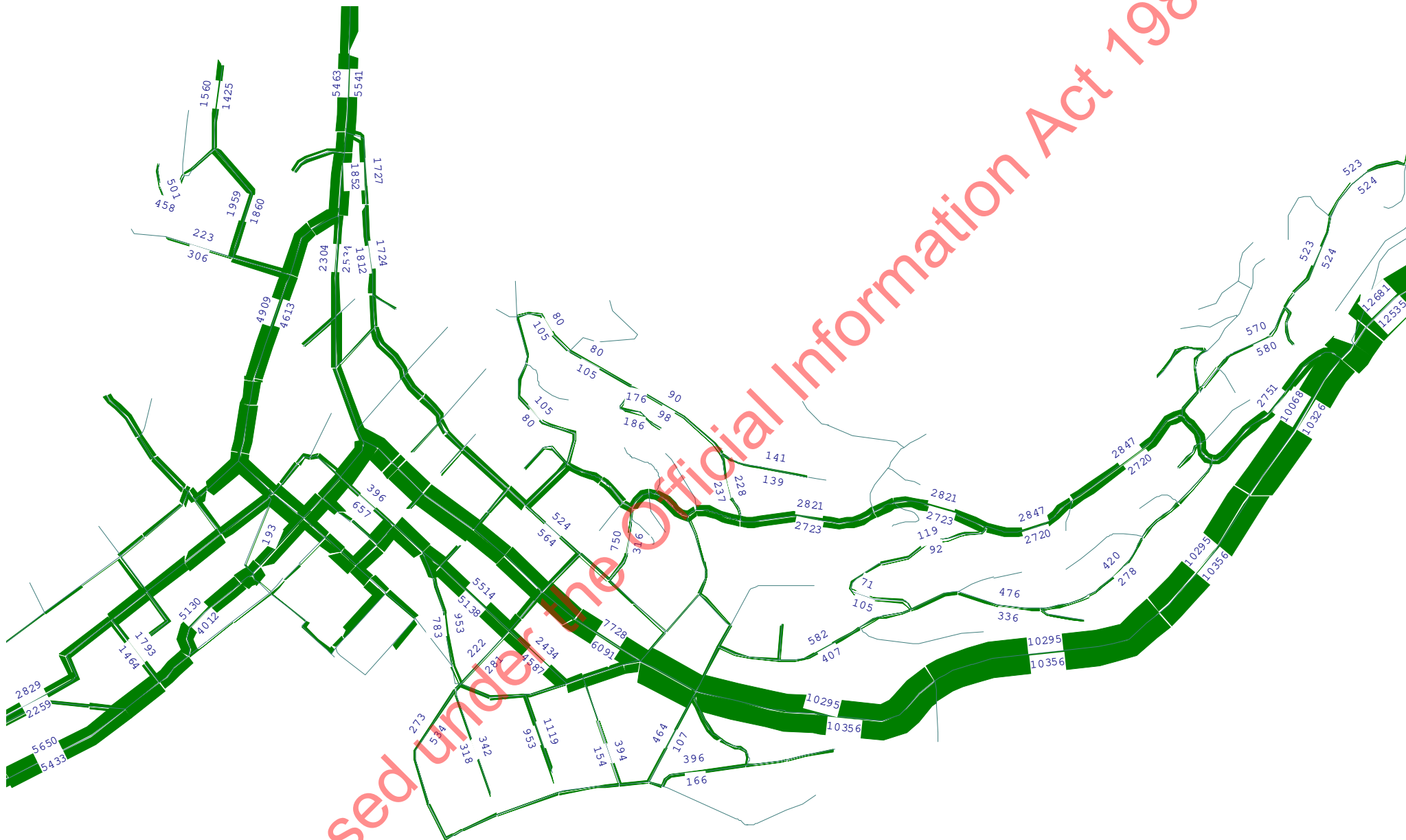
The Tracks Model has been used to determine the transport economic benefits with most elements of the proposed packages producing benefits going forwards. Introducing Stage 2 with Stanley street open shows some disbenefit in 2018 which also occurs in the Stage 3 arterial test however the two future years for these scenarios has network benefits. The outputs will be used to inform the benefit cost ratios in the business case packages but will be supplemented with public transport travel time benefits and wider economic benefits where applicable.

The preferred Spatial Plan forecast received in August 2020 was run as a sensitivity test and demonstrated that economic benefits could increase by 13% for the NZUP Package, improving the economic case should the District grow more in line with the Spatial Plan forecast.

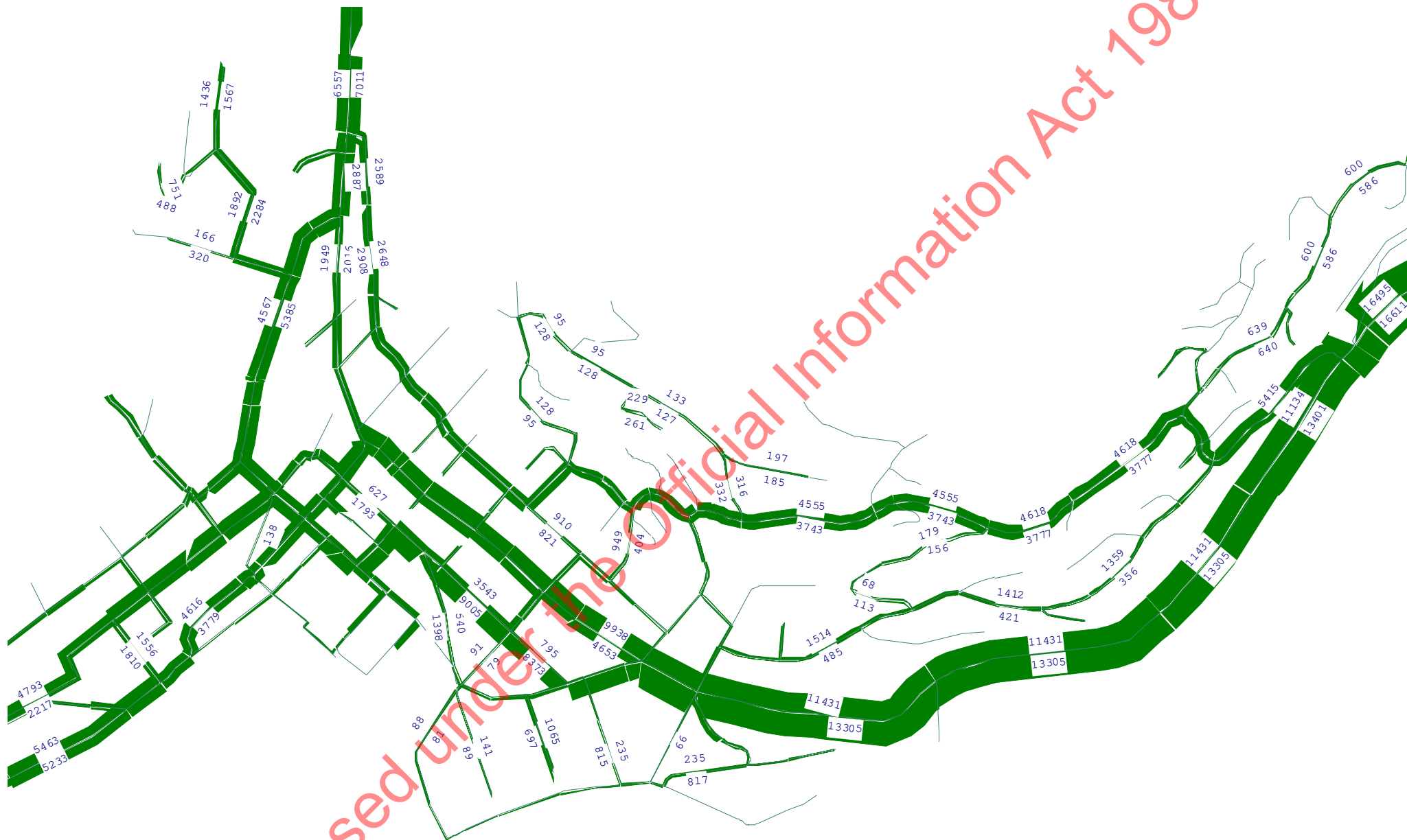
Appendix A

All Day Traffic Flow Analysis Plots

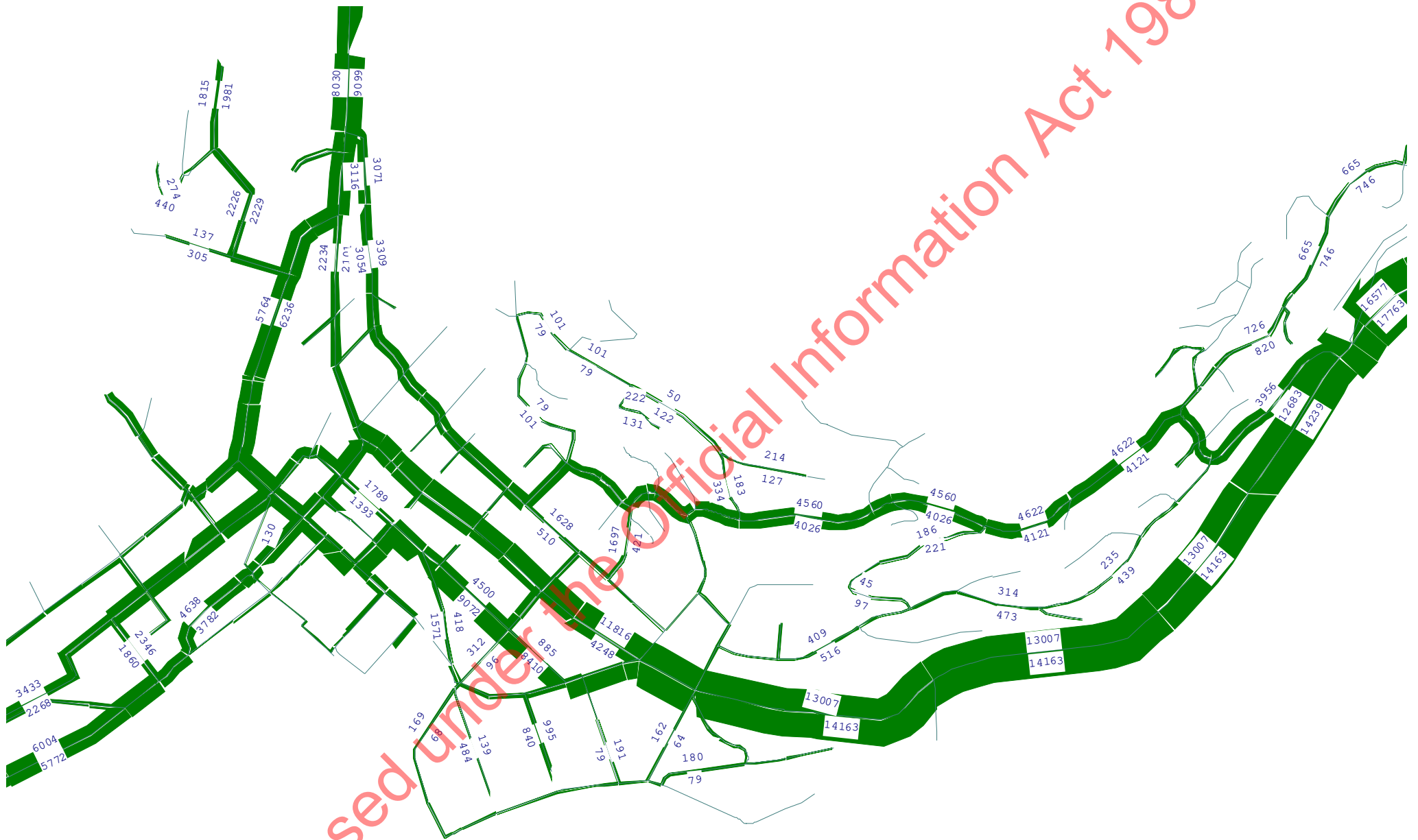




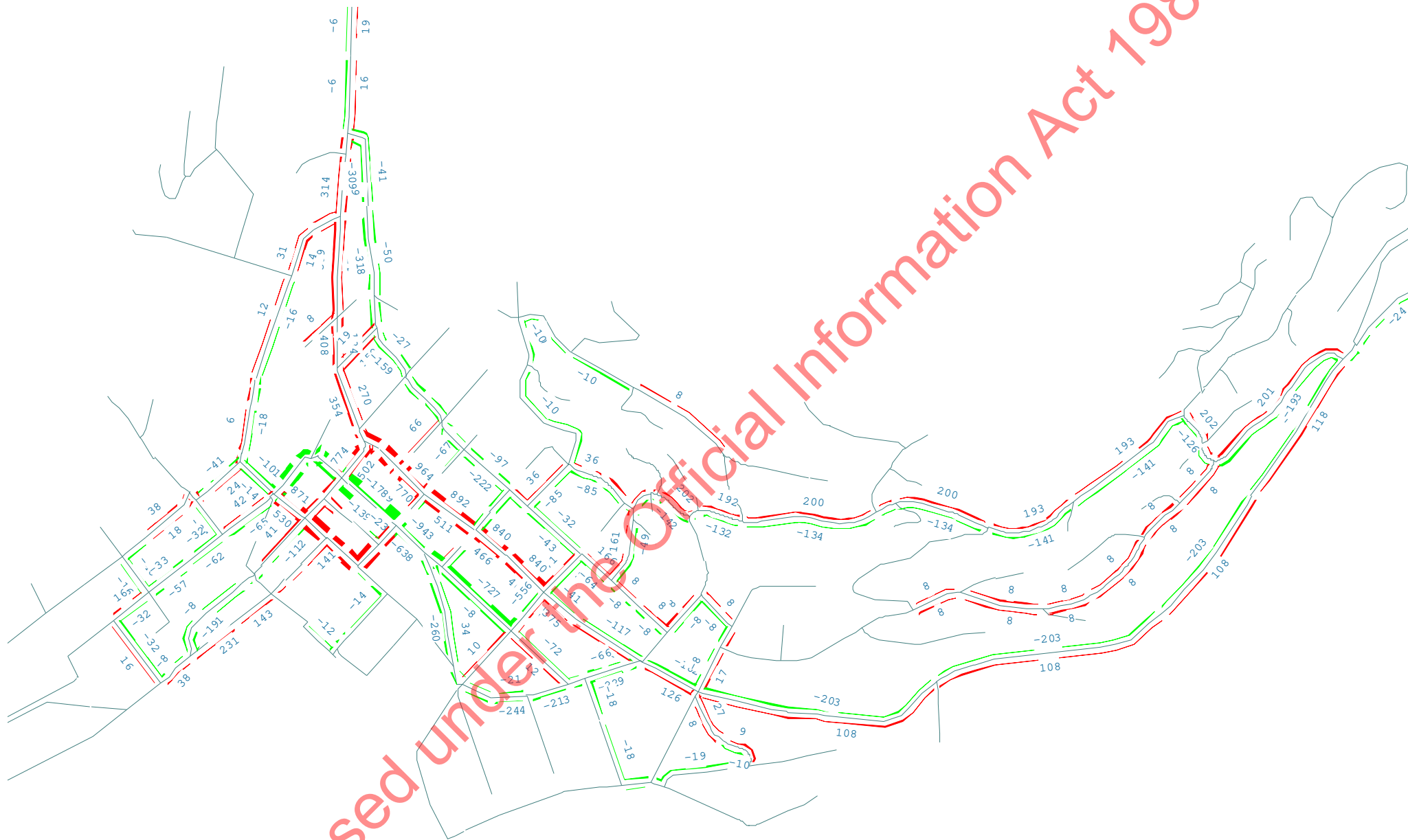
2018 All Day Volumes – Scenario 1 – Queenstown Town Centre View



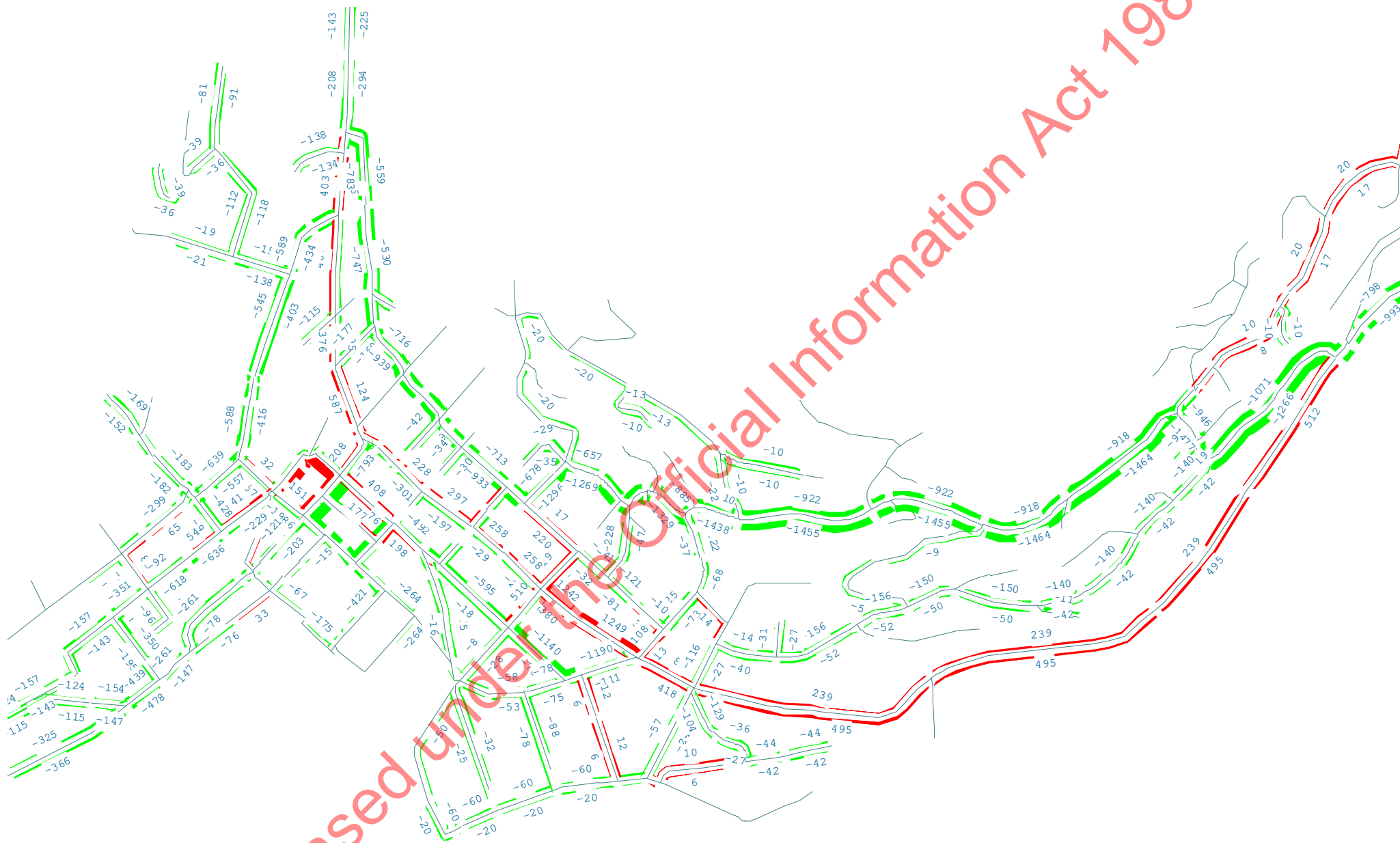
2028 All Day Volumes – Scenario 1 – Queenstown Town Centre View



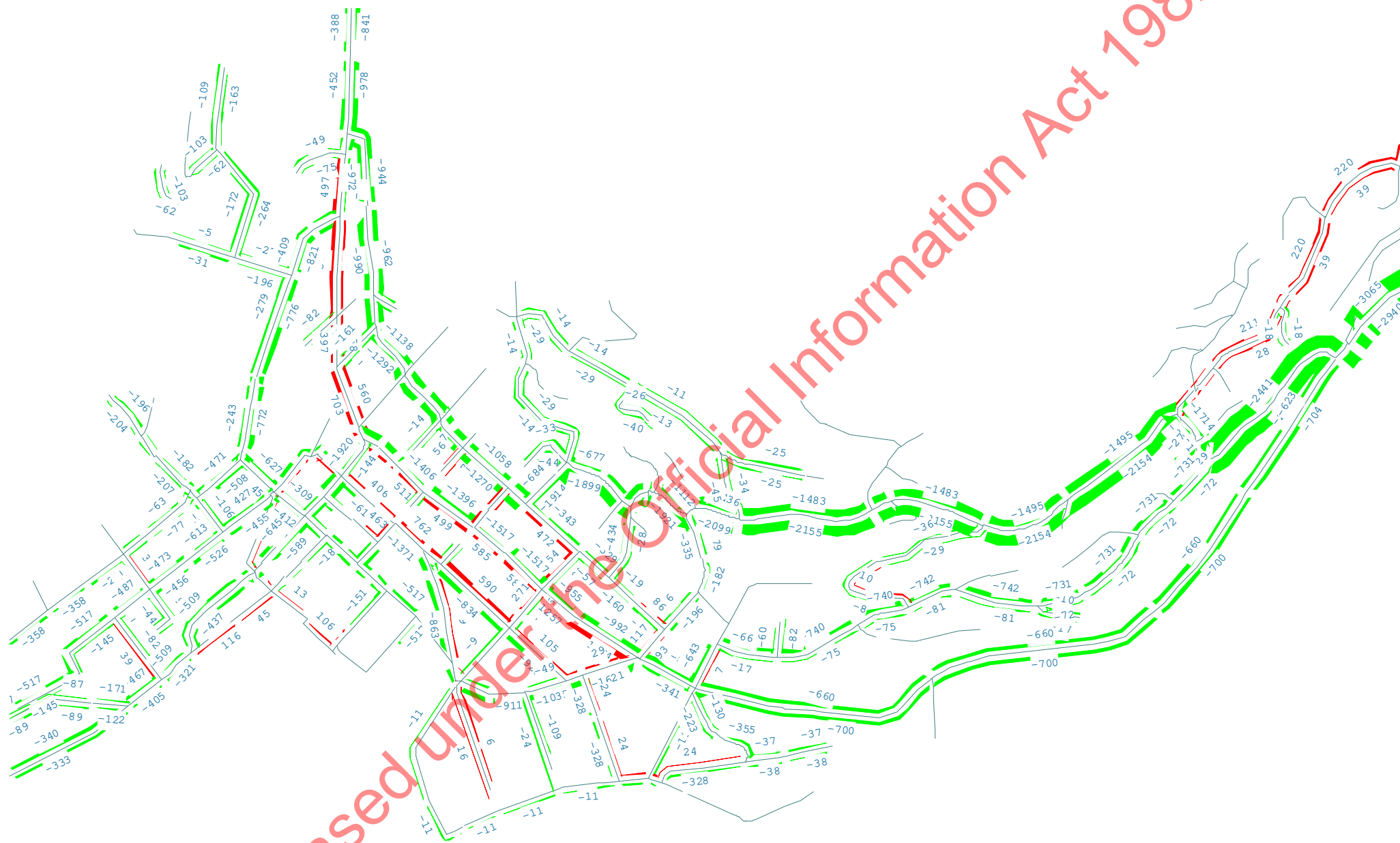
2048 All Day Volumes – Scenario 1 – Queenstown Town Centre View



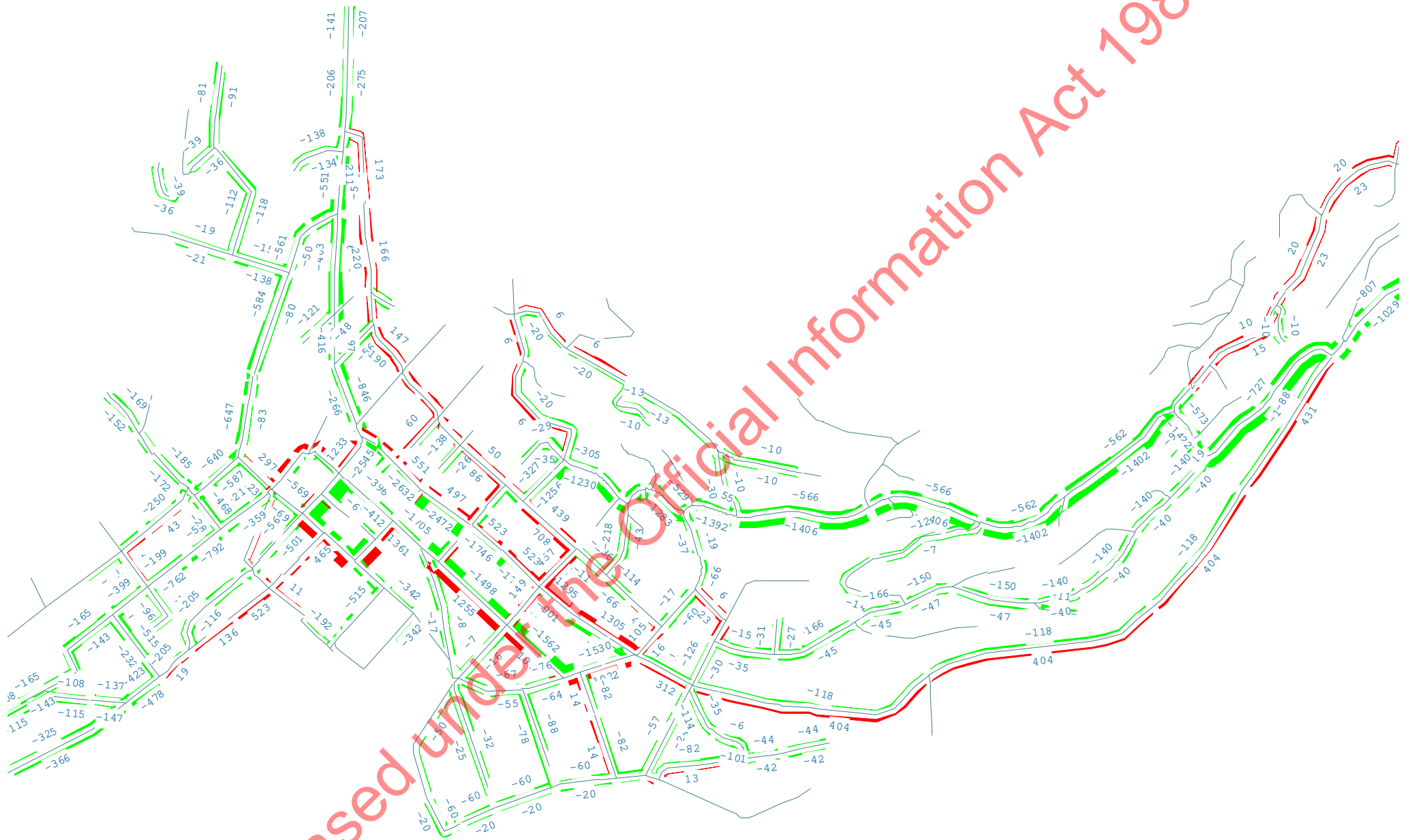
2048 All Day Volume Change – Scenario 2 (change from Scenario 1) – Queenstown Town Centre View



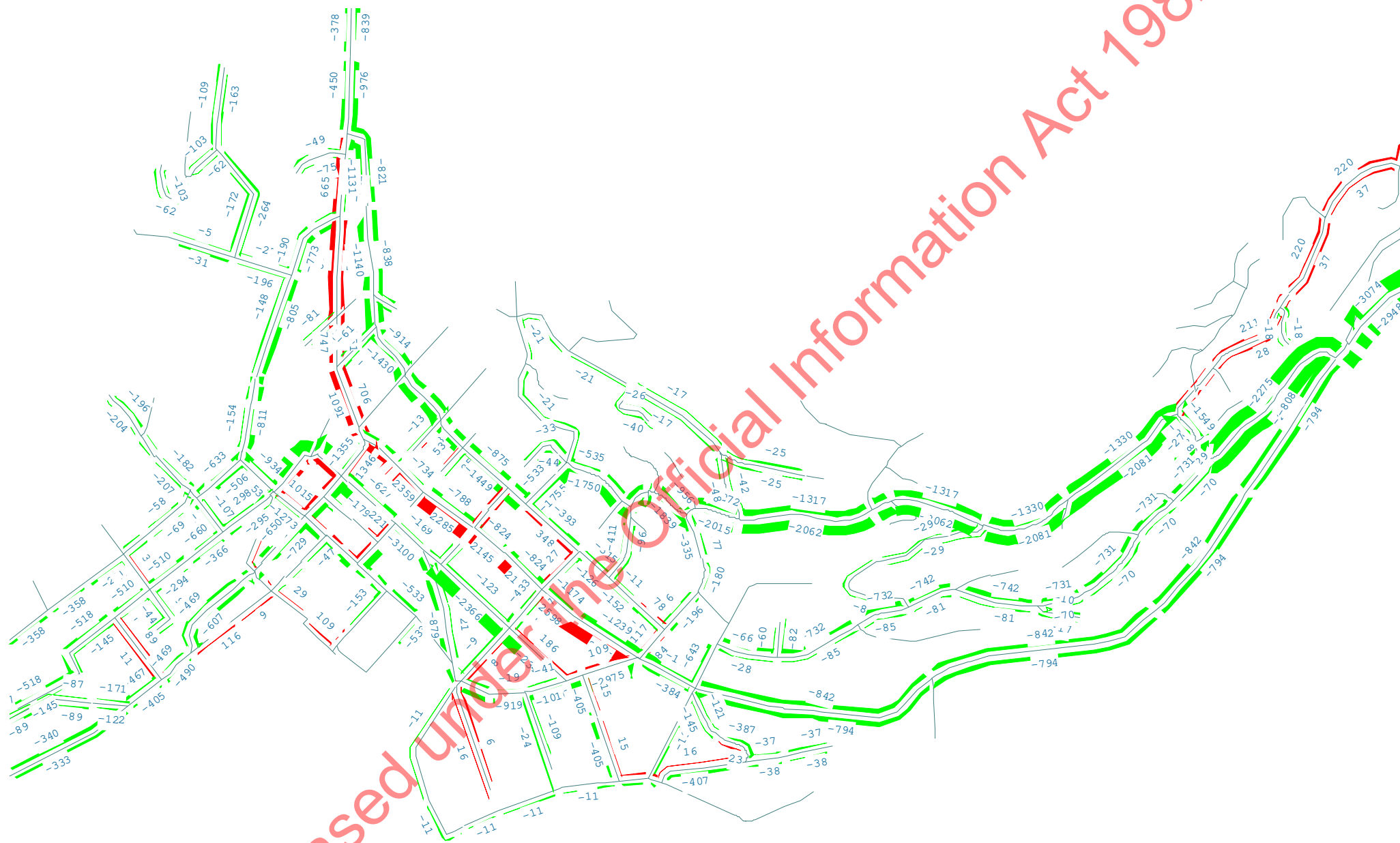
2018 All Day Volume Change – Scenario 3 (change from Scenario 1) – Queenstown Town Centre View



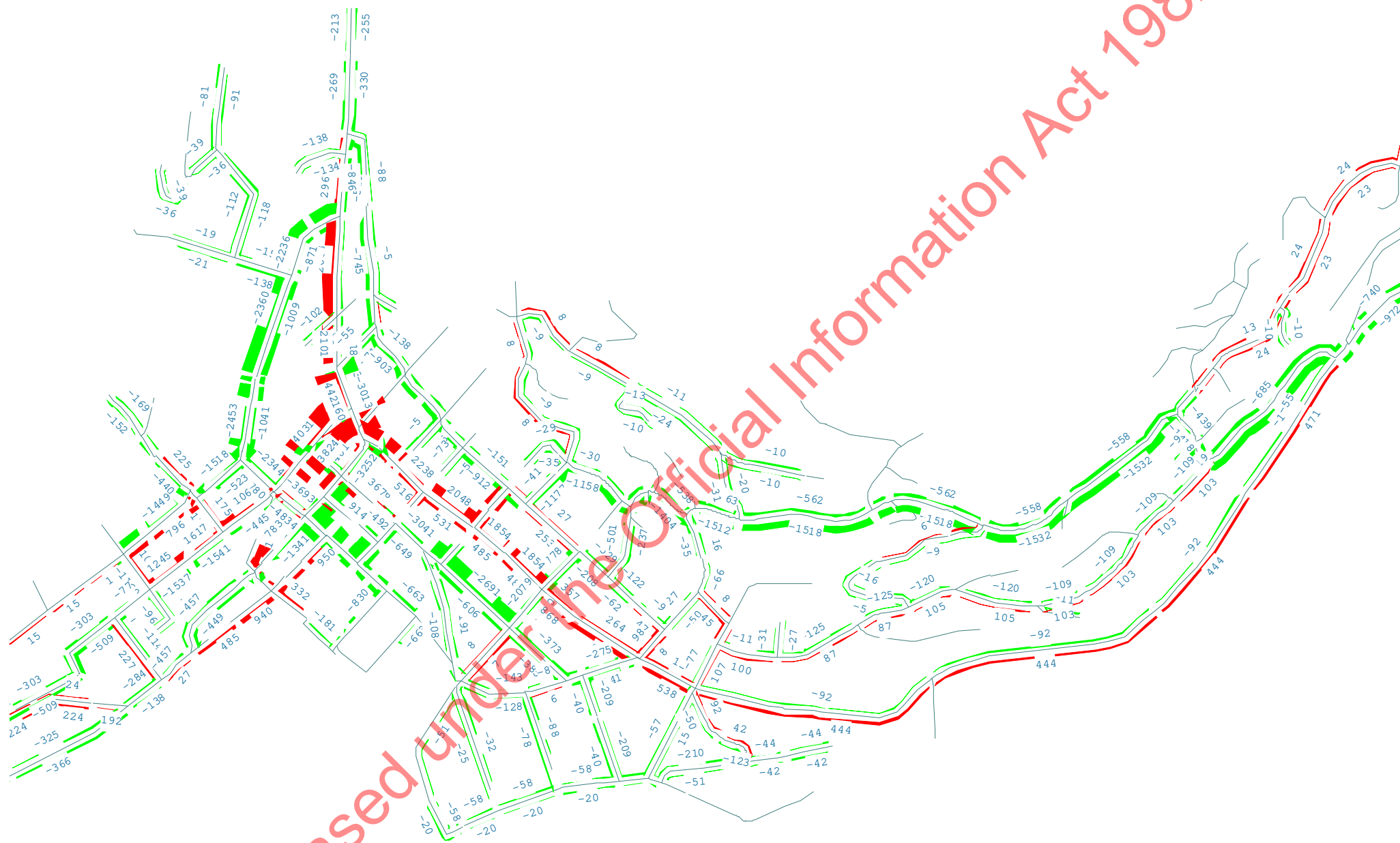
2028 All Day Volume Change – Scenario 3 (change from Scenario 1) – Queenstown Town Centre View



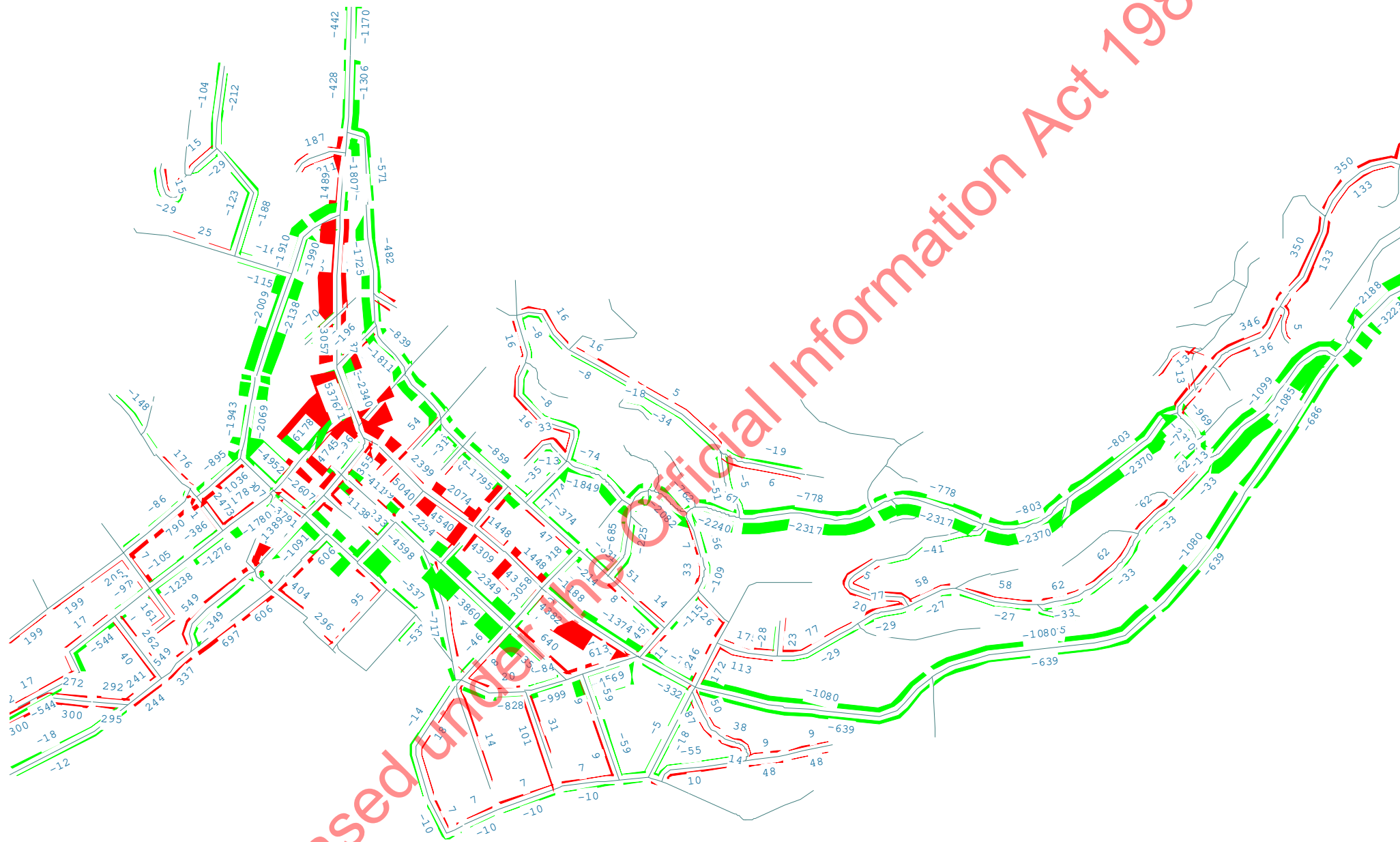
2018 All Day Volume Change – Scenario 4 (change from Scenario 1) – Queenstown Town Centre View



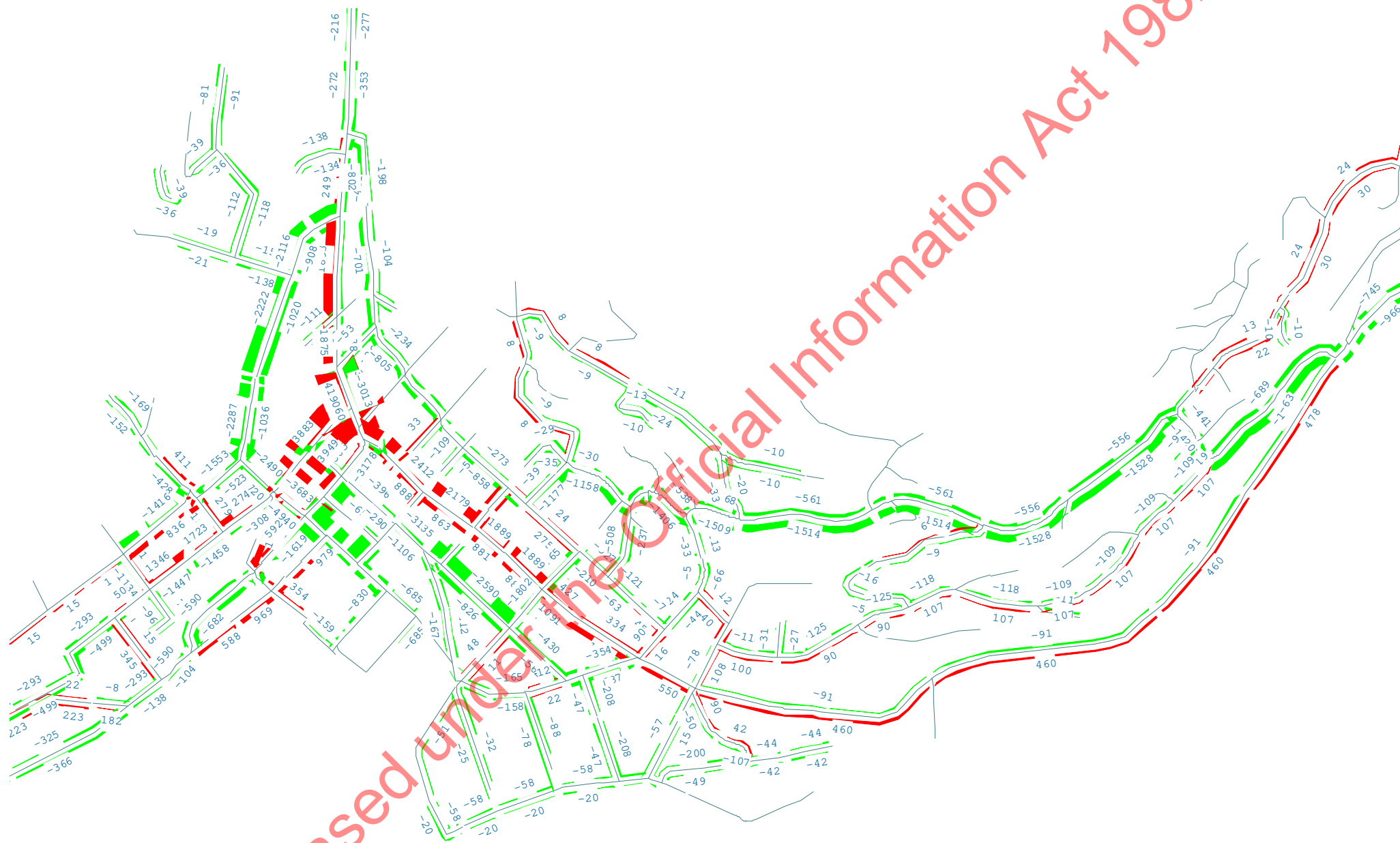
2028 All Day Volume Change – Scenario 4 (change from Scenario 1) – Queenstown Town Centre View



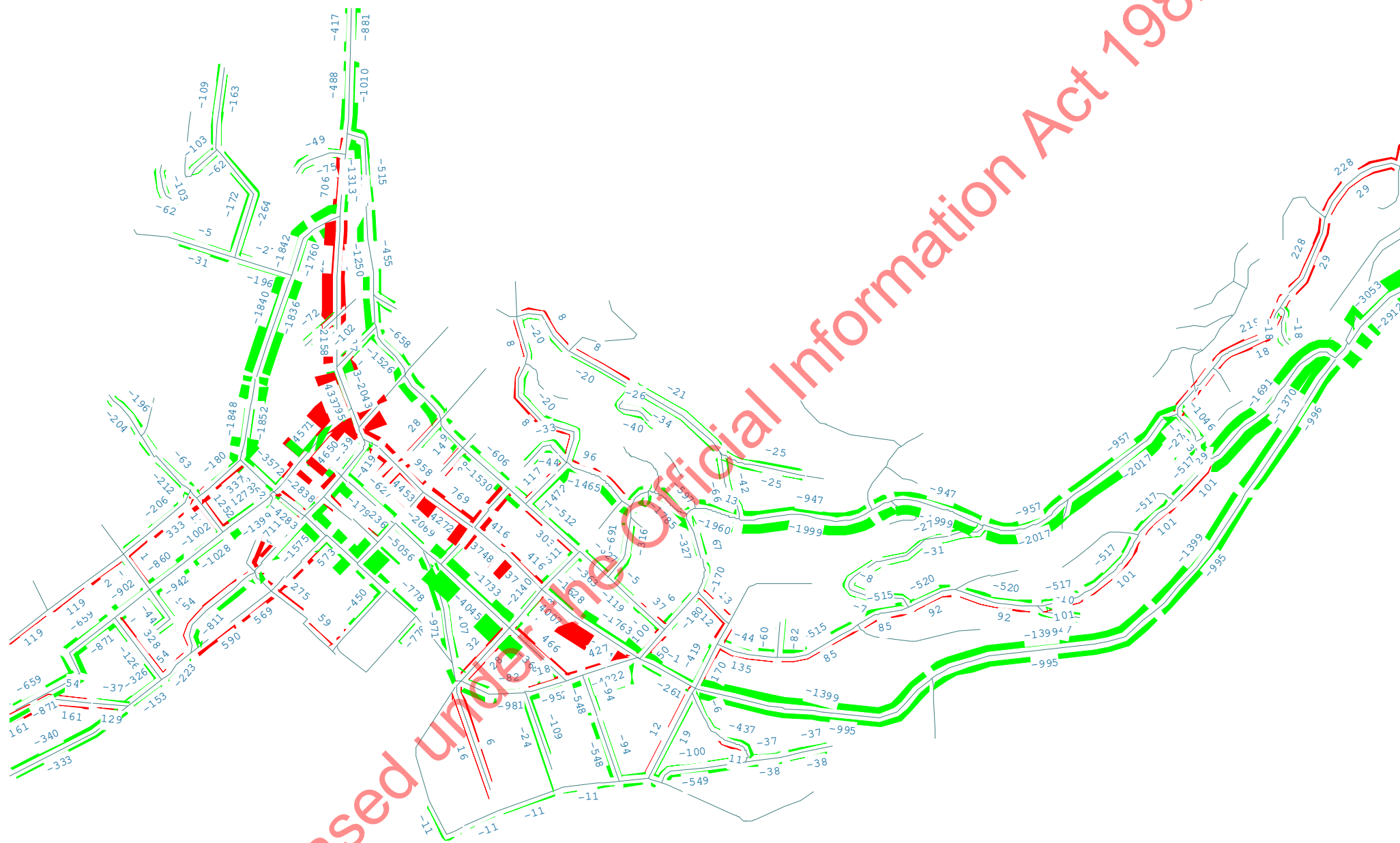
2018 All Day Volume Change – Scenario 5 (change from Scenario 1) – Queenstown Town Centre View



2048 All Day Volume Change – Scenario 5 (change from Scenario 1) – Queenstown Town Centre View



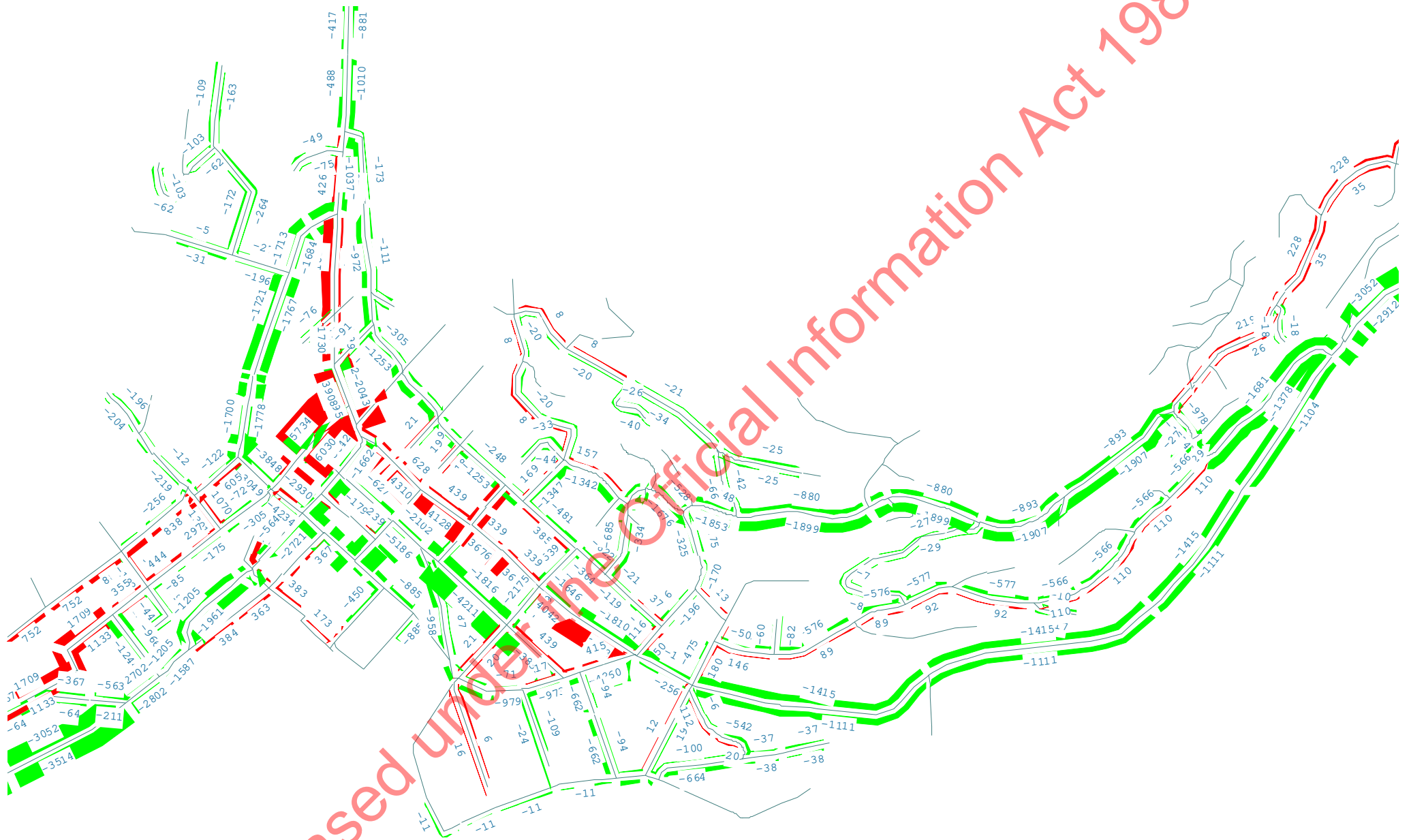
2018 All Day Volume Change – Scenario 6 (change from Scenario 1) – Queenstown Town Centre View



2028 All Day Volume Change – Scenario 6 (change from Scenario 1) – Queenstown Town Centre View



2018 All Day Volume Change – Scenario 7 (change from Scenario 1) – Queenstown Town Centre View



2028 All Day Volume Change – Scenario 7 (change from Scenario 1) – Queenstown Town Centre View

Appendix B

Transport Economics Outputs



Summary of Travel Totals and Costs from Strategic Modelling Scenario 1 vs Scenario 0 Do Minimum (incl A1) against Do Minimum (without A1)

Year	Scenario	Network Name	Period	Total Vehicle Kms	Total Vehicle Minutes	Mean Network Speed	Total Vehicle Operating Costs	Total In Vehicle Time Cost	Total Link Congestion Cost	Total Intersection Congestion	Total Additional Congestion	Total Network Operating Costs
Base 2018	2018 Network Do Min (without Stage 1 Arterial)	QT18NU.000	AM Peak	145,684	190,532	45.88	\$ 46,775	\$ 79,566	\$ 7	\$ 1,254	\$ 1,262	\$ 127,603
			Inter Peak	150,257	201,203	44.81	\$ 48,312	\$ 84,022	\$ 36	\$ 1,447	\$ 1,484	\$ 133,818
			PM Peak	188,954	246,113	44.07	\$ 60,496	\$ 102,776	\$ 318	\$ 1,740	\$ 2,058	\$ 165,330
			Annual	643,319,680	854,550,976		\$ 206,647,593	\$ 356,858,806	\$ 307,370	\$ 6,060,486	\$ 6,371,374	\$ 569,877,774
Base 2028	2018 Network Do Min (includes Stage 1 Arterial)	QT18NU.000	AM Peak	145,736	190,117	45.99	\$ 46,784	\$ 79,392	\$ 2	\$ 1,249	\$ 1,251	\$ 127,427
			Inter Peak	150,340	200,534	44.98	\$ 48,327	\$ 83,743	\$ 11	\$ 1,416	\$ 1,428	\$ 133,498
			PM Peak	188,966	245,784	46.12	\$ 60,503	\$ 102,639	\$ 186	\$ 1,735	\$ 1,922	\$ 165,064
			Annual	643,601,405	852,138,443		\$ 206,701,278	\$ 355,852,279	\$ 148,960	\$ 5,963,206	\$ 6,115,732	\$ 568,669,288
Updated 2028	2028 Network Do Min (without Stage 1 Arterial)	QT28NU.000	AM Peak	204,200	267,735	45.76	\$ 65,437	\$ 111,806	\$ 655	\$ 1,824	\$ 2,480	\$ 179,723
			Inter Peak	214,410	287,966	44.67	\$ 68,871	\$ 120,254	\$ 1,088	\$ 2,241	\$ 3,329	\$ 192,454
			PM Peak	263,786	343,887	46.02	\$ 84,189	\$ 143,607	\$ 1,033	\$ 2,515	\$ 3,548	\$ 231,344
			Annual	912,251,399	1,215,025,677		\$ 292,600,921	\$ 507,392,742	\$ 4,221,083	\$ 9,206,778	\$ 13,428,434	\$ 813,422,097
Updated 2048	2028 Network Do Min (includes Stage 1 Arterial)	QT28NU.000	AM Peak	204,252	267,455	45.82	\$ 65,451	\$ 111,689	\$ 620	\$ 1,847	\$ 2,467	\$ 179,607
			Inter Peak	214,434	287,518	44.74	\$ 68,889	\$ 120,067	\$ 1,058	\$ 2,234	\$ 3,292	\$ 192,248
			PM Peak	263,797	343,676	46.05	\$ 84,205	\$ 143,519	\$ 919	\$ 2,538	\$ 3,457	\$ 231,181
			Annual	912,358,716	1,213,414,691		\$ 292,671,892	\$ 506,720,273	\$ 4,041,922	\$ 9,213,611	\$ 13,255,533	\$ 812,647,698
Updated 2048	2048 Network Do Min (without Stage 1 Arterial)	QT48NU.000	AM Peak	266,381	351,383	45.49	\$ 85,227	\$ 146,737	\$ 1,598	\$ 2,563	\$ 4,162	\$ 236,126
			Inter Peak	296,221	395,719	44.91	\$ 94,778	\$ 165,252	\$ 1,631	\$ 3,119	\$ 4,751	\$ 264,781
			PM Peak	363,393	489,797	44.52	\$ 116,106	\$ 204,539	\$ 3,803	\$ 4,161	\$ 7,964	\$ 328,609
			Annual	1,250,668,755	1,670,889,167		\$ 400,056,443	\$ 697,762,116	\$ 8,079,687	\$ 13,237,798	\$ 21,321,004	\$ 1,119,139,563
Updated 2048	2048 Network Do Min (includes Stage 1 Arterial)	QT48NU.000	AM Peak	266,401	351,453	45.47	\$ 85,247	\$ 146,766	\$ 1,595	\$ 2,598	\$ 4,194	\$ 236,207
			Inter Peak	296,265	395,430	44.95	\$ 94,804	\$ 165,131	\$ 1,568	\$ 3,133	\$ 4,702	\$ 264,637
			PM Peak	363,413	489,730	44.52	\$ 116,137	\$ 204,511	\$ 3,666	\$ 4,200	\$ 7,866	\$ 328,514
			Annual	1,250,822,230	1,670,036,443		\$ 400,163,724	\$ 697,404,949	\$ 7,807,390	\$ 13,323,292	\$ 21,134,201	\$ 1,118,702,874

Summary of Annualised Benefits from Strategic Modelling Of Stage 1 Arterial Option

Scenario	Year	Total Vehicle Operating Costs	Emissions Benefits (4% of VOC)	Total In Vehicle Time Cost	Total Additional Congestion	Accident Costs	PT Travel Time Benefits	Travel Time Reliability Costs (5% of TTC)	Total Network Operating Costs
Benefits	NZUP vs Do Min	2018	-\$ 53,684	-\$ 2,147	\$ 1,006,528	\$ 255,642	\$ 1,193	\$ 50,326	\$ 1,257,858
	NZUP vs Do Min	2028	-\$ 70,971	-\$ 2,839	\$ 672,469	\$ 172,901	\$ 28,906	\$ 33,623	\$ 834,089
	NZUP vs Do Min	2048	-\$ 107,281	-\$ 4,291	\$ 357,167	\$ 186,803	\$ 59,658	\$ 17,858	\$ 509,915

Un-normalised using standard Crash Compendium equations

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 19,468,556	\$ 23,375,172	\$ 42,843,728	
2018 Option	\$ 19,373,158	\$ 23,404,238	\$ 42,777,396	\$ 66,332
2028 Do min	\$ 26,014,412	\$ 32,778,254	\$ 58,792,666	
2028 Option	\$ 25,898,412	\$ 32,796,438	\$ 58,694,850	\$ 97,816
2048 Do min	\$ 32,810,680	\$ 44,237,188	\$ 77,047,868	
2048 Option	\$ 32,610,046	\$ 44,262,600	\$ 76,872,646	\$ 175,222

Normalised based on total Queenstown crashes in base year

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 9,734,278	\$ 37,400,275	\$ 47,134,553	
2018 Option	\$ 9,686,579	\$ 37,446,781	\$ 47,133,360	\$ 1,193
2028 Do min	\$ 13,007,206	\$ 52,445,206	\$ 65,452,412	
2028 Option	\$ 12,949,206	\$ 52,474,301	\$ 65,423,507	\$ 28,906
2048 Do min	\$ 16,405,340	\$ 70,779,501	\$ 87,184,841	
2048 Option	\$ 16,305,023	\$ 70,820,160	\$ 87,125,183	\$ 59,658

Calibration based on Queenstown Injury accidents 2009-19

Link	1.6
Intersection	0.5

Summary of Travel Totals and Costs from Strategic Modelling Scenario 3 vs Scenario 1 NZUP+A1 against Do Minimum (Incl A1)

Year	Scenario	Network Name	Period	Total Vehicle Kms	Total Vehicle Minutes	Mean Network Speed	Total Vehicle Operating Costs	Total In Vehicle Time Cost	Total Link Congestion Cost	Total Intersection Congestion	Total Additional Congestion	Total Network Operating Costs
Base 2018	2018 Network Do Min	QT18NU.000	AM Peak	145,736	190,117	45.99	\$ 46,784	\$ 79,392	\$ 2	\$ 1,249	\$ 1,251	\$ 127,427
			Inter Peak	150,340	200,534	44.98	\$ 48,327	\$ 83,743	\$ 11	\$ 1,416	\$ 1,428	\$ 133,498
			PM Peak	188,966	245,784	46.12	\$ 60,503	\$ 102,639	\$ 186	\$ 1,735	\$ 1,922	\$ 165,064
			Annual	643,601,405	852,138,443		\$ 206,701,278	\$ 355,852,279	\$ 148,960	\$ 5,963,206	\$ 6,115,732	\$ 568,669,288
Base 2018	2018 Network + NZUP	QT18NU.000	AM Peak	142,472	187,378	45.62	\$ 45,983	\$ 78,249	\$ -	\$ 1,413	\$ 1,413	\$ 125,645
			Inter Peak	146,925	197,101	44.72	\$ 47,492	\$ 82,309	\$ 2	\$ 1,607	\$ 1,610	\$ 131,411
			PM Peak	186,569	243,950	45.88	\$ 60,020	\$ 101,873	\$ 55	\$ 1,935	\$ 1,991	\$ 163,884
			Annual	630,184,578	839,318,788		\$ 203,483,029	\$ 350,498,061	\$ 40,019	\$ 6,743,886	\$ 6,787,471	\$ 560,768,560
Updated 2028	2028 Network Do Min	QT28NU.000	AM Peak	204,252	267,455	45.82	\$ 65,451	\$ 111,689	\$ 620	\$ 1,847	\$ 2,467	\$ 179,607
			Inter Peak	214,434	287,518	44.74	\$ 68,889	\$ 120,067	\$ 1,058	\$ 2,234	\$ 3,292	\$ 192,248
			PM Peak	263,797	343,676	46.05	\$ 84,205	\$ 143,519	\$ 919	\$ 2,538	\$ 3,457	\$ 231,181
			Annual	912,358,716	1,213,414,691		\$ 292,671,892	\$ 506,720,273	\$ 4,041,922	\$ 9,213,611	\$ 13,255,533	\$ 812,647,698
Updated 2028	2028 Network + NZUP	QT28NU.000	AM Peak	197,897	259,737	45.71	\$ 63,712	\$ 108,466	\$ 154	\$ 1,985	\$ 2,139	\$ 174,317
			Inter Peak	206,346	276,298	44.80	\$ 66,554	\$ 115,382	\$ 127	\$ 2,389	\$ 2,516	\$ 184,452
			PM Peak	256,102	331,008	46.42	\$ 81,938	\$ 138,228	\$ 245	\$ 2,537	\$ 2,782	\$ 222,948
			Annual	880,118,627	1,168,082,326		\$ 283,390,825	\$ 487,790,365	\$ 614,357	\$ 9,748,632	\$ 10,362,989	\$ 781,544,179
Updated 2048	2048 Network Do Min	QT48NU.000	AM Peak	266,401	351,453	45.47	\$ 85,247	\$ 146,766	\$ 1,595	\$ 2,598	\$ 4,194	\$ 236,207
			Inter Peak	296,265	395,430	44.95	\$ 94,804	\$ 165,131	\$ 1,568	\$ 3,133	\$ 4,702	\$ 264,637
			PM Peak	363,413	489,730	44.52	\$ 116,137	\$ 204,511	\$ 3,666	\$ 4,200	\$ 7,866	\$ 328,514
			Annual	1,250,822,230	1,670,036,443		\$ 400,163,724	\$ 697,404,949	\$ 7,807,390	\$ 13,323,292	\$ 21,134,201	\$ 1,118,702,874
Updated 2048	2048 Network + NZUP	QT48NU.000	AM Peak	259,926	341,980	45.60	\$ 83,463	\$ 142,810	\$ 451	\$ 2,720	\$ 3,172	\$ 229,445
			Inter Peak	288,169	386,674	44.71	\$ 92,654	\$ 161,475	\$ 545	\$ 3,332	\$ 3,877	\$ 258,006
			PM Peak	355,106	468,571	45.47	\$ 113,426	\$ 195,675	\$ 1,194	\$ 4,059	\$ 5,254	\$ 314,355
			Annual	1,218,110,065	1,625,687,545		\$ 391,126,295	\$ 678,886,294	\$ 2,604,647	\$ 13,891,878	\$ 16,497,719	\$ 1,086,510,308

Summary of Annualised Benefits from Strategic Modelling Of NZUP Option

Scenario	Year	Total Vehicle Operating Costs	Emissions Benefits (4% of VOC)	Total In Vehicle Time Cost	Total Additional Congestion	Accident Costs	PT Travel Time Benefits	Travel Time Reliability Costs (5% of TTC)	Total Network Operating Costs
Benefits	NZUP vs Do Min	2018	\$ 3,218,249	\$ 128,730	\$ 5,354,218	\$ 671,739	\$ 497,376	\$ 267,711	\$ 8,794,545
	NZUP vs Do Min	2028	\$ 9,281,067	\$ 371,243	\$ 18,929,907	\$ 2,892,545	\$ 1,624,816	\$ 946,495	\$ 34,046,072
	NZUP vs Do Min	2048	\$ 9,037,429	\$ 361,497	\$ 18,518,655	\$ 4,636,482	\$ 1,612,727	\$ 925,933	\$ 35,092,723

Un-normalised using standard Crash Compendium equations

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 19,373,158	\$ 23,404,238	\$ 42,777,396	
2018 Option	\$ 19,456,594	\$ 23,067,304	\$ 42,523,898	\$ 253,498
2028 Do min	\$ 25,898,412	\$ 32,796,438	\$ 58,694,850	
2028 Option	\$ 25,198,816	\$ 31,999,552	\$ 57,198,368	\$ 1,496,482
2048 Do min	\$ 32,610,046	\$ 44,262,600	\$ 76,872,646	
2048 Option	\$ 32,049,654	\$ 43,429,768	\$ 75,479,422	\$ 1,393,224

Normalised based on total Queenstown crashes in base year

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 9,686,579	\$ 37,446,781	\$ 47,133,360	
2018 Option	\$ 9,728,297	\$ 36,907,686	\$ 46,635,983	\$ 497,376
2028 Do min	\$ 12,949,206	\$ 52,474,301	\$ 65,423,507	
2028 Option	\$ 12,599,408	\$ 51,199,283	\$ 63,798,691	\$ 1,624,816
2048 Do min	\$ 16,305,023	\$ 70,820,160	\$ 87,125,183	
2048 Option	\$ 16,024,827	\$ 69,487,629	\$ 85,512,456	\$ 1,612,727

Calibration based on Queenstown Injury accidents 2009-19

Link	1.6
Intersection	0.5

Summary of Travel Totals and Costs from Strategic Modelling Scenario 4 vs Scenario 2 NZUP+A1 against Do Minimum (Incl A1) both with Stanley St Closed

Year	Scenario	Network Name	Period	Total Vehicle Kms	Total Vehicle Minutes	Mean Network Speed	Total Vehicle Operating Costs	Total In Vehicle Time Cost	Total Link Congestion Cost	Total Intersection Congestion	Total Additional Congestion	Total Network Operating Costs
Base 2018	2018 Network Do Min Stanley St Closed	QT18NU.000	AM Peak	145,728	190,144	45.98	\$ 46,781	\$ 79,404	\$ 2	\$ 1,253	\$ 1,255	\$ 127,440
			Inter Peak	150,358	200,576	44.97	\$ 48,337	\$ 83,760	\$ 11	\$ 1,413	\$ 1,424	\$ 133,521
			PM Peak	188,980	246,016	46.08	\$ 60,514	\$ 102,736	\$ 185	\$ 1,758	\$ 1,943	\$ 165,193
			Annual	643,658,527	852,421,584		\$ 206,735,839	\$ 355,969,418	\$ 148,340	\$ 5,970,933	\$ 6,119,272	\$ 568,824,530
Base 2018	2018 Network + NZUP Stanley St Closed	QT18NU.000	AM Peak	142,498	187,677	45.55	\$ 46,007	\$ 78,373	\$ -	\$ 1,443	\$ 1,443	\$ 125,823
			Inter Peak	146,953	198,093	44.51	\$ 47,535	\$ 82,723	\$ 16	\$ 1,693	\$ 1,709	\$ 131,967
			PM Peak	186,580	244,729	45.74	\$ 60,055	\$ 102,199	\$ 45	\$ 2,023	\$ 2,068	\$ 164,322
			Annual	630,288,778	842,895,486		\$ 203,645,158	\$ 351,990,860	\$ 75,051	\$ 7,068,999	\$ 7,144,050	\$ 562,780,068
Updated 2028	2028 Network Do Min Stanley St Closed	QT28NU.000	AM Peak	204,248	267,478	45.81	\$ 65,452	\$ 111,698	\$ 621	\$ 1,844	\$ 2,466	\$ 179,616
			Inter Peak	214,445	287,844	44.70	\$ 68,897	\$ 120,203	\$ 1,082	\$ 2,261	\$ 3,343	\$ 192,443
			PM Peak	263,804	343,802	46.03	\$ 84,209	\$ 143,571	\$ 918	\$ 2,549	\$ 3,468	\$ 231,248
			Annual	912,393,168	1,214,466,303		\$ 292,698,511	\$ 507,158,291	\$ 4,112,568	\$ 9,298,247	\$ 13,412,009	\$ 813,268,811
Updated 2028	2028 Network + NZUP Stanley St Closed	QT28NU.000	AM Peak	197,893	259,938	45.67	\$ 63,713	\$ 108,549	\$ 157	\$ 2,014	\$ 2,172	\$ 174,434
			Inter Peak	206,383	276,040	44.85	\$ 66,556	\$ 115,274	\$ 123	\$ 2,366	\$ 2,490	\$ 184,320
			PM Peak	256,125	331,219	46.39	\$ 81,950	\$ 138,317	\$ 242	\$ 2,570	\$ 2,812	\$ 223,079
			Annual	880,239,592	1,167,568,482		\$ 283,404,735	\$ 487,575,034	\$ 602,433	\$ 9,717,979	\$ 10,323,930	\$ 781,303,699
Updated 2048	2048 Network Do Min Stanley St Closed	QT48NU.000	AM Peak	266,424	351,515	45.47	\$ 85,255	\$ 146,792	\$ 1,596	\$ 2,601	\$ 4,198	\$ 236,245
			Inter Peak	296,277	395,917	44.89	\$ 94,810	\$ 165,334	\$ 1,586	\$ 3,175	\$ 4,761	\$ 264,905
			PM Peak	363,431	489,892	44.51	\$ 116,147	\$ 204,578	\$ 3,665	\$ 4,216	\$ 7,881	\$ 328,606
			Annual	1,250,881,926	1,671,606,976		\$ 400,192,187	\$ 698,059,368	\$ 7,860,363	\$ 13,458,652	\$ 21,319,588	\$ 1,119,571,143
Updated 2048	2048 Network + NZUP Stanley St Closed	QT48NU.000	AM Peak	259,925	342,086	45.58	\$ 83,458	\$ 142,855	\$ 450	\$ 2,741	\$ 3,192	\$ 229,505
			Inter Peak	288,202	387,705	44.60	\$ 92,675	\$ 161,905	\$ 488	\$ 3,460	\$ 3,948	\$ 258,528
			PM Peak	355,128	469,044	45.42	\$ 113,441	\$ 195,872	\$ 1,186	\$ 4,109	\$ 5,296	\$ 314,609
			Annual	1,218,220,346	1,629,078,647		\$ 391,194,594	\$ 680,300,907	\$ 2,431,214	\$ 14,311,968	\$ 16,744,375	\$ 1,088,239,875

Summary of Annualised Benefits from Strategic Modelling Of NZUP Option with Stanley St Closed

Scenario	Year	Total Vehicle Operating Costs	Emissions Benefits (4% of VOC)	Total In Vehicle Time Cost	Total Additional Congestion	Accident Costs	PT Travel Time Benefits	Travel Time Reliability Costs (5% of TTC)	Total Network Operating Costs
Benefits	NZUP vs Do Min (Both Stanley Clsd)	2018	\$ 3,090,681	\$ 123,627	\$ 3,978,558	\$ 1,024,778	\$ 485,811	\$ 198,928	\$ 6,852,828
	NZUP vs Do Min (Both Stanley Clsd)	2028	\$ 9,293,776	\$ 371,751	\$ 19,583,257	\$ 3,088,079	\$ 1,618,376	\$ 979,163	\$ 34,934,402
	NZUP vs Do Min (Both Stanley Clsd)	2048	\$ 8,997,593	\$ 359,904	\$ 17,758,462	\$ 4,575,213	\$ 1,596,566	\$ 887,923	\$ 34,175,661

Un-normalised using standard Crash Compendium equations

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 19,155,882	\$ 23,401,062	\$ 42,556,944	
2018 Option	\$ 19,263,806	\$ 23,063,704	\$ 42,327,510	\$ 229,434
2028 Do min	\$ 25,639,070	\$ 32,786,100	\$ 58,425,170	
2028 Option	\$ 24,938,984	\$ 31,993,392	\$ 56,932,376	\$ 1,492,794
2048 Do min	\$ 32,360,578	\$ 44,251,336	\$ 76,611,914	
2048 Option	\$ 31,855,676	\$ 43,411,264	\$ 75,266,940	\$ 1,344,974

Normalised based on total Queenstown crashes in base year

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 9,577,941	\$ 37,441,699	\$ 47,019,640	
2018 Option	\$ 9,631,903	\$ 36,901,926	\$ 46,533,829	\$ 485,811
2028 Do min	\$ 12,819,535	\$ 52,457,760	\$ 65,277,295	
2028 Option	\$ 12,469,492	\$ 51,189,427	\$ 63,658,919	\$ 1,618,376
2048 Do min	\$ 16,180,289	\$ 70,802,138	\$ 86,982,427	
2048 Option	\$ 15,927,838	\$ 69,458,022	\$ 85,385,860	\$ 1,596,566

Calibration based on Queenstown Injury accidents 2009-19

Link	1.6
Intersection	0.5

Summary of Travel Totals and Costs from Strategic Modelling Scenario 5 vs Scenario 3 NZUP+A12 against NZUP+A1

Year	Scenario	Network Name	Period	Total Vehicle Kms	Total Vehicle Minutes	Mean Network Speed	Total Vehicle Operating Costs	Total In Vehicle Time Cost	Total Link Congestion Cost	Total Intersection Congestion Cost	Total Additional Congestion	Total Network Operating Costs
Base 2018	2018 Network + NZUP	QT18NU.000	AM Peak	142,472	187,378	45.62	\$ 45,983	\$ 78,249	\$ -	\$ 1,413	\$ 1,413	\$ 125,645
			Inter Peak	146,925	197,101	44.72	\$ 47,492	\$ 82,309	\$ 2	\$ 1,607	\$ 1,610	\$ 131,411
			PM Peak	186,569	243,950	45.88	\$ 60,020	\$ 101,873	\$ 55	\$ 1,935	\$ 1,991	\$ 163,884
			Annual	630,184,578	839,318,788		\$ 203,483,029	\$ 350,498,061	\$ 40,019	\$ 6,743,886	\$ 6,787,471	\$ 560,768,560
	2018 Network Stage 2 Arterials	QT18NU.000	AM Peak	142,480	187,621	45.56	\$ 46,017	\$ 78,350	\$ -	\$ 1,445	\$ 1,445	\$ 125,814
			Inter Peak	146,905	198,221	44.47	\$ 47,546	\$ 82,777	\$ 3	\$ 1,735	\$ 1,738	\$ 132,062
			PM Peak	186,553	243,876	45.90	\$ 60,040	\$ 101,842	\$ 54	\$ 1,925	\$ 2,013	\$ 163,896
			Annual	630,120,323	842,711,139		\$ 203,673,982	\$ 351,915,221	\$ 42,344	\$ 7,133,049	\$ 7,196,490	\$ 562,785,693
	2028 Network + NZUP	QT28NU.000	AM Peak	197,897	259,737	45.71	\$ 63,712	\$ 108,466	\$ 154	\$ 1,985	\$ 2,139	\$ 174,317
			Inter Peak	206,346	276,298	44.80	\$ 66,554	\$ 115,382	\$ 127	\$ 2,389	\$ 2,516	\$ 184,452
			PM Peak	256,102	331,008	46.42	\$ 81,938	\$ 138,228	\$ 245	\$ 2,537	\$ 2,782	\$ 222,948
			Annual	880,118,627	1,168,082,326		\$ 283,390,825	\$ 487,790,365	\$ 614,357	\$ 9,748,632	\$ 10,362,989	\$ 781,544,179
	2028 Network Stage 2 Arterials	QT28NU.000	AM Peak	197,876	259,544	45.74	\$ 63,704	\$ 108,385	\$ 156	\$ 2,003	\$ 2,159	\$ 174,249
			Inter Peak	206,339	275,690	44.91	\$ 66,583	\$ 115,127	\$ 128	\$ 2,351	\$ 2,480	\$ 184,192
			PM Peak	256,098	331,095	46.41	\$ 81,952	\$ 138,265	\$ 244	\$ 2,579	\$ 2,824	\$ 223,042
			Annual	880,083,492	1,166,234,816		\$ 283,480,349	\$ 487,015,792	\$ 617,828	\$ 9,673,077	\$ 10,294,471	\$ 780,790,611
Updated 2048	2048 Network + NZUP	QT48NU.000	AM Peak	259,926	341,980	45.60	\$ 83,463	\$ 142,810	\$ 451	\$ 2,720	\$ 3,172	\$ 229,445
			Inter Peak	288,169	386,674	44.71	\$ 92,654	\$ 161,475	\$ 545	\$ 3,332	\$ 3,877	\$ 258,006
			PM Peak	355,106	468,571	45.47	\$ 113,426	\$ 195,675	\$ 1,194	\$ 4,059	\$ 5,254	\$ 314,355
			Annual	1,218,110,065	1,625,687,545		\$ 391,126,295	\$ 678,886,294	\$ 2,604,647	\$ 13,891,878	\$ 16,497,719	\$ 1,086,510,308
	2048 Network Stage 2 Arterials	QT48NU.000	AM Peak	259,915	341,692	45.64	\$ 83,461	\$ 142,690	\$ 461	\$ 2,722	\$ 3,183	\$ 229,335
			Inter Peak	288,116	386,322	44.75	\$ 92,652	\$ 161,328	\$ 487	\$ 3,347	\$ 3,834	\$ 257,815
			PM Peak	355,112	468,731	45.45	\$ 113,459	\$ 195,741	\$ 1,195	\$ 4,098	\$ 5,294	\$ 314,495
			Annual	1,217,951,371	1,624,584,953		\$ 391,139,734	\$ 678,425,485	\$ 2,440,156	\$ 13,961,407	\$ 16,402,184	\$ 1,085,967,403

Summary of Annualised Benefits from Strategic Modelling Of NZUP Arterial Stage 2 Option

Scenario	Year	Total Vehicle Operating Costs	Emissions Benefits (4% of VOC)	Total In Vehicle Time Cost	Total Additional Congestion	Accident Costs	PT Travel Time Benefits	Travel Time Reliability Costs (5% of TTC)	Total Network Operating Costs
NZUP+A12 vs NZUP+A1	2018	-\$ 190,953	-\$ 7,638	-\$ 1,417,160	-\$ 409,019	-\$ 118,584		-\$ 70,858	-\$ 2,214,212
NZUP+A12 vs NZUP+A1	2028	-\$ 89,524	-\$ 3,581	\$ 774,574	\$ 68,518	-\$ 116,570		\$ 38,729	\$ 672,146
NZUP+A12 vs NZUP+A1	2048	-\$ 13,439	-\$ 538	\$ 460,809	\$ 95,535	-\$ 117,357		\$ 23,040	\$ 448,051

Un-normalised using standard Crash Compendium equations

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 19,456,594	\$ 23,067,304	\$ 42,523,898	
2018 Option	\$ 19,653,416	\$ 23,079,912	\$ 42,733,328	-\$ 209,430
2028 Do min	\$ 25,198,816	\$ 31,999,552	\$ 57,198,368	
2028 Option	\$ 25,402,452	\$ 32,008,772	\$ 57,411,224	-\$ 212,856
2048 Do min	\$ 32,049,654	\$ 43,429,768	\$ 75,479,422	
2048 Option	\$ 32,256,630	\$ 43,438,436	\$ 75,695,066	-\$ 215,644

Normalised based on total Queenstown crashes in base year

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 9,728,297	\$ 36,907,686	\$ 46,635,983	
2018 Option	\$ 9,826,708	\$ 36,927,859	\$ 46,754,567	-\$ 118,584
2028 Do min	\$ 12,599,408	\$ 51,199,283	\$ 63,798,691	
2028 Option	\$ 12,701,226	\$ 51,214,035	\$ 63,915,261	-\$ 116,570
2048 Do min	\$ 16,024,827	\$ 69,487,629	\$ 85,512,456	
2048 Option	\$ 16,128,315	\$ 69,501,498	\$ 85,629,813	-\$ 117,357

Calibration based on Queenstown Injury accidents 2009-19

Link	1.6
Intersection	0.5

Summary of Travel Totals and Costs from Strategic Modelling Scenario 6 vs Scenario 4 NZUP+A12 against NZUP+A1 (both Stanley Street Closed)

Year	Scenario	Network Name	Period	Total Vehicle Kms	Total Vehicle Minutes	Mean Network Speed	Total Vehicle Operating Costs	Total In Vehicle Time Cost	Total Link Congestion Cost	Total Intersection Congestion Cost	Total Additional Congestion	Total Network Operating Costs
Base 2018	2018 Network + NZUP Stanley St Closed	QT18NU.000	AM Peak	142,498	187,677	45.55	\$ 46,007	\$ 78,373	\$ -	\$ 1,443	\$ 1,443	\$ 125,823
			Inter Peak	146,953	198,093	44.51	\$ 47,535	\$ 82,723	\$ 16	\$ 1,693	\$ 1,709	\$ 131,967
			PM Peak	186,580	244,729	45.74	\$ 60,055	\$ 102,199	\$ 45	\$ 2,023	\$ 2,068	\$ 164,322
			Annual	630,288,778	842,895,486		\$ 203,645,158	\$ 351,990,860	\$ 75,051	\$ 7,068,999	\$ 7,144,050	\$ 562,780,068
Base 2028	2018 Network Stage 2 Arterials Stanley St Closed	QT18NU.000	AM Peak	142,487	187,695	45.55	\$ 46,025	\$ 78,381	\$ -	\$ 1,452	\$ 1,452	\$ 125,858
			Inter Peak	146,917	197,425	44.65	\$ 47,534	\$ 82,444	\$ 3	\$ 1,645	\$ 1,648	\$ 131,628
			PM Peak	186,577	243,963	45.89	\$ 60,051	\$ 101,879	\$ 57	\$ 1,964	\$ 2,021	\$ 163,952
			Annual	630,174,573	840,462,870		\$ 203,650,045	\$ 350,975,076	\$ 44,205	\$ 6,896,160	\$ 6,940,366	\$ 561,565,487
Updated 2028	2028 Network + NZUP Stanley St Closed	QT28NU.000	AM Peak	197,893	259,938	45.67	\$ 63,713	\$ 108,549	\$ 157	\$ 2,014	\$ 2,172	\$ 174,434
			Inter Peak	206,383	276,040	44.85	\$ 66,556	\$ 115,274	\$ 123	\$ 2,366	\$ 2,490	\$ 184,320
			PM Peak	256,125	331,219	46.39	\$ 81,950	\$ 138,317	\$ 242	\$ 2,570	\$ 2,812	\$ 223,079
			Annual	880,239,592	1,167,568,482		\$ 283,404,735	\$ 487,575,034	\$ 602,433	\$ 9,717,979	\$ 10,323,930	\$ 781,303,699
Updated 2048	2028 Network Stage 2 Arterials Stanley St Closed	QT28NU.000	AM Peak	197,885	259,550	45.74	\$ 63,706	\$ 108,388	\$ 157	\$ 2,001	\$ 2,158	\$ 174,253
			Inter Peak	206,340	275,686	44.91	\$ 66,586	\$ 115,126	\$ 128	\$ 2,347	\$ 2,475	\$ 184,188
			PM Peak	256,100	331,058	46.41	\$ 81,958	\$ 138,249	\$ 244	\$ 2,576	\$ 2,820	\$ 223,029
			Annual	880,092,836	1,166,203,514		\$ 283,494,055	\$ 487,004,637	\$ 618,401	\$ 9,658,287	\$ 10,276,688	\$ 780,775,380
Updated 2048	2048 Network + NZUP Stanley St Closed	QT48NU.000	AM Peak	259,925	342,086	45.58	\$ 83,458	\$ 142,855	\$ 450	\$ 2,741	\$ 3,192	\$ 229,505
			Inter Peak	288,202	387,705	44.60	\$ 92,675	\$ 161,905	\$ 488	\$ 3,460	\$ 3,948	\$ 258,528
			PM Peak	355,128	469,044	45.42	\$ 113,441	\$ 195,872	\$ 1,186	\$ 4,109	\$ 5,296	\$ 314,609
			Annual	1,218,220,346	1,629,078,647		\$ 391,194,594	\$ 680,300,907	\$ 2,431,214	\$ 14,311,968	\$ 16,744,375	\$ 1,088,239,875
Updated 2048	2048 Network Stage 2 Arterials Stanley St Closed	QT48NU.000	AM Peak	259,915	341,692	45.64	\$ 83,461	\$ 142,690	\$ 461	\$ 2,722	\$ 3,183	\$ 229,335
			Inter Peak	288,123	386,254	44.76	\$ 92,663	\$ 161,299	\$ 487	\$ 3,333	\$ 3,821	\$ 257,785
			PM Peak	355,121	468,770	45.45	\$ 113,463	\$ 195,758	\$ 1,194	\$ 4,093	\$ 5,288	\$ 314,509
			Annual	1,217,977,574	1,624,408,855		\$ 391,174,617	\$ 678,350,613	\$ 2,439,536	\$ 13,917,067	\$ 16,360,169	\$ 1,085,885,399

Summary of Annualised Benefits from Strategic Modelling Of NZUP Arterial Stage 2 Option with Stanley Street closed

Scenario	Year	Total Vehicle Operating Costs	Emissions Benefits (4% of VOC)	Total In Vehicle Time Cost	Total Additional Congestion	Accident Costs	PT Travel Time Benefits	Travel Time Reliability Costs (5% of TTC)	Total Network Operating Costs
Benefits	NZUP+A12 vs NZUP+A1 (clsd Stnly)	2018	-\$ 4,887	-\$ 195	\$ 1,015,784	\$ 203,685	-\$ 188,700	\$ 50,789	\$ 1,076,475
	NZUP+A12 vs NZUP+A1 (clsd Stnly)	2028	-\$ 89,319	-\$ 3,573	\$ 570,396	\$ 47,242	-\$ 204,225	\$ 28,520	\$ 349,041
	NZUP+A12 vs NZUP+A1 (clsd Stnly)	2048	\$ 19,976	\$ 799	\$ 1,950,294	\$ 384,206	-\$ 202,526	\$ 97,515	\$ 2,250,264

Un-normalised using standard Crash Compendium equations

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 19,263,806	\$ 23,063,704	\$ 42,327,510	
2018 Option	\$ 19,588,290	\$ 23,080,240	\$ 42,668,530	-\$ 341,020
2028 Do min	\$ 24,938,984	\$ 31,993,392	\$ 56,932,376	
2028 Option	\$ 25,306,654	\$ 32,006,136	\$ 57,312,790	-\$ 380,414
2048 Do min	\$ 31,855,676	\$ 43,411,264	\$ 75,266,940	
2048 Option	\$ 32,172,332	\$ 43,438,888	\$ 75,611,220	-\$ 344,280

Normalised based on total Queenstown crashes in base year

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 9,631,903	\$ 36,901,926	\$ 46,533,829	
2018 Option	\$ 9,794,145	\$ 36,928,384	\$ 46,722,529	-\$ 188,700
2028 Do min	\$ 12,469,492	\$ 51,189,427	\$ 63,658,919	
2028 Option	\$ 12,653,327	\$ 51,209,818	\$ 63,863,145	-\$ 204,225
2048 Do min	\$ 15,927,838	\$ 69,458,022	\$ 85,385,860	
2048 Option	\$ 16,086,166	\$ 69,502,221	\$ 85,588,387	-\$ 202,526

Calibration based on Queenstown Injury accidents 2009-19

Link	1.6
Intersection	0.5

Summary of Travel Totals and Costs from Strategic Modelling Scenario 7 vs Scenario 6 NZUP+A123 against NZUP+A12 (both Stanley Street Closed)

Year	Scenario	Network Name	Period	Total Vehicle Kms	Total Vehicle Minutes	Mean Network Speed	Total Vehicle Operating Costs	Total In Vehicle Time Cost	Total Link Congestion Cost	Total Intersection Congestion Cost	Total Additional Congestion	Total Network Operating Costs
Base 2018	2018 Network Stage 2 Arterials Stanley St Closed	QT18NU.000	AM Peak	142,487	187,695	45.55	\$ 46,025	\$ 78,381	\$ -	\$ 1,452	\$ 1,452	\$ 125,858
			Inter Peak	146,917	197,425	44.65	\$ 47,534	\$ 82,444	\$ 3	\$ 1,645	\$ 1,648	\$ 131,628
			PM Peak	186,577	243,963	45.89	\$ 60,051	\$ 101,879	\$ 57	\$ 1,964	\$ 2,021	\$ 163,952
			Annual	630,174,573	840,462,870		\$ 203,650,045	\$ 350,975,076	\$ 44,205	\$ 6,896,160	\$ 6,940,366	\$ 561,565,487
	2018 Network Stage 3 Arterials Stanley St Closed	QT18NU.000	AM Peak	142,453	187,394	45.61	\$ 46,004	\$ 78,255	\$ -	\$ 1,438	\$ 1,438	\$ 125,698
			Inter Peak	146,881	197,883	44.54	\$ 47,530	\$ 82,635	\$ 3	\$ 1,707	\$ 1,711	\$ 131,877
			PM Peak	186,515	243,654	45.93	\$ 60,019	\$ 101,749	\$ 56	\$ 1,954	\$ 2,011	\$ 163,780
			Annual	630,010,579	841,447,709		\$ 203,606,373	\$ 351,384,807	\$ 43,585	\$ 7,064,557	\$ 7,111,707	\$ 562,102,887
	2028 Network Stage 2 Arterials Stanley St Closed	QT28NU.000	AM Peak	197,885	259,550	45.74	\$ 63,706	\$ 108,388	\$ 157	\$ 2,001	\$ 2,158	\$ 174,253
			Inter Peak	206,340	275,686	44.91	\$ 66,586	\$ 115,126	\$ 128	\$ 2,347	\$ 2,475	\$ 184,188
			PM Peak	256,100	331,058	46.41	\$ 81,958	\$ 138,249	\$ 244	\$ 2,576	\$ 2,820	\$ 223,029
			Annual	880,092,836	1,166,203,514		\$ 283,494,055	\$ 487,004,637	\$ 618,401	\$ 9,658,287	\$ 10,276,688	\$ 780,775,380
	2028 Network Stage 3 Arterials Stanley St Closed	QT28NU.000	AM Peak	197,837	259,218	45.79	\$ 63,685	\$ 108,249	\$ 157	\$ 1,984	\$ 2,141	\$ 174,076
			Inter Peak	206,288	275,360	44.95	\$ 66,568	\$ 114,990	\$ 128	\$ 2,328	\$ 2,457	\$ 184,015
			PM Peak	256,029	330,950	46.42	\$ 81,927	\$ 138,204	\$ 244	\$ 2,589	\$ 2,833	\$ 222,965
			Annual	879,868,106	1,164,985,998		\$ 283,409,765	\$ 486,496,466	\$ 618,401	\$ 9,600,646	\$ 10,221,993	\$ 780,128,224
Updated 2048	2048 Network Stage 2 Arterials Stanley St Closed	QT48NU.000	AM Peak	259,915	341,692	45.64	\$ 83,461	\$ 142,690	\$ 461	\$ 2,722	\$ 3,183	\$ 229,335
			Inter Peak	288,123	386,254	44.76	\$ 92,663	\$ 161,299	\$ 487	\$ 3,333	\$ 3,821	\$ 257,785
			PM Peak	355,121	468,770	45.45	\$ 113,463	\$ 195,758	\$ 1,194	\$ 4,093	\$ 5,288	\$ 314,509
			Annual	1,217,977,574	1,624,408,855		\$ 391,174,617	\$ 678,350,613	\$ 2,439,536	\$ 13,917,067	\$ 16,360,169	\$ 1,085,885,399
	2048 Network Stage 3 Arterials Stanley St Closed	QT48NU.000	AM Peak	259,859	341,375	45.67	\$ 83,434	\$ 142,558	\$ 462	\$ 2,708	\$ 3,171	\$ 229,163
			Inter Peak	288,064	385,863	44.79	\$ 92,634	\$ 161,136	\$ 486	\$ 3,313	\$ 3,799	\$ 257,570
			PM Peak	355,044	467,840	45.53	\$ 113,413	\$ 195,370	\$ 1,195	\$ 4,021	\$ 5,217	\$ 314,001
			Annual	1,217,723,917	1,622,498,423		\$ 391,042,699	\$ 677,554,092	\$ 2,437,784	\$ 13,805,457	\$ 16,244,435	\$ 1,084,841,225

Summary of Annualised Benefits from Strategic Modelling Of NZUP Arterial Stage 3 Option with Stanley Street closed

Scenario	Year	Total Vehicle Operating Costs	Emissions Benefits (4% of VOC)	Total In Vehicle Time Cost	Total Additional Congestion	Accident Costs	PT Travel Time Benefits	Travel Time Reliability Costs (5% of TTC)	Total Network Operating Costs
Benefits	NZUP+A123 vs NZUP+A12 (clsd Stnly	2018	\$ 43,672	\$ 1,747	\$ 409,731	\$ 171,342	-\$ 121,853	-\$ 20,487	-\$ 677,993
	NZUP+A123 vs NZUP+A12 (clsd Stnly	2028	\$ 84,289	\$ 3,372	\$ 508,171	\$ 54,695	-\$ 131,639	\$ 25,409	\$ 544,297
	NZUP+A123 vs NZUP+A12 (clsd Stnly	2048	\$ 131,918	\$ 5,277	\$ 796,521	\$ 115,734	-\$ 156,488	\$ 39,826	\$ 932,789

Un-normalised using standard Crash Compendium equations

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 19,588,290	\$ 23,080,240	\$ 42,668,530	
2018 Option	\$ 19,637,896	\$ 23,140,896	\$ 42,778,792	-\$ 110,262
2028 Do min	\$ 25,306,654	\$ 32,006,136	\$ 57,312,790	
2028 Option	\$ 25,367,526	\$ 32,069,388	\$ 57,436,914	-\$ 124,124
2048 Do min	\$ 32,172,332	\$ 43,438,888	\$ 75,611,220	
2048 Option	\$ 32,236,834	\$ 43,516,536	\$ 75,753,370	-\$ 142,150

Normalised based on total Queenstown crashes in base year

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 9,794,145	\$ 36,928,384	\$ 46,722,529	
2018 Option	\$ 9,818,948	\$ 37,025,434	\$ 46,844,382	-\$ 121,853
2028 Do min	\$ 12,653,327	\$ 51,209,818	\$ 63,863,145	
2028 Option	\$ 12,683,763	\$ 51,311,021	\$ 63,994,784	-\$ 131,639
2048 Do min	\$ 16,086,166	\$ 69,502,221	\$ 85,588,387	
2048 Option	\$ 16,118,417	\$ 69,626,458	\$ 85,744,875	-\$ 156,488

Calibration based on Queenstown Injury accidents 2009-19

Link	1.6
Intersection	0.5

Summary of Travel Totals and Costs from Strategic Modelling Scenario 3 vs Scenario 1 NZUP+A1 against Do Minimum (Incl A1) Spatial Plan Landuse Test

Year	Scenario	Network Name	Period	Total Vehicle Kms	Total Vehicle Minutes	Mean Network Speed	Total Vehicle Operating Costs	Total In Vehicle Time Cost	Total Link Congestion Cost	Total Intersection Congestion	Total Additional Congestion	Total Network Operating Costs
Base 2018	2018 Network Do Min	QT18NU.000	AM Peak	145,736	190,117	45.99	\$ 46,784	\$ 79,392	\$ 2	\$ 1,249	\$ 1,251	\$ 127,427
			Inter Peak	150,340	200,534	44.98	\$ 48,327	\$ 83,743	\$ 11	\$ 1,416	\$ 1,428	\$ 133,498
			PM Peak	188,966	245,784	46.12	\$ 60,503	\$ 102,639	\$ 186	\$ 1,735	\$ 1,922	\$ 165,064
			Annual	643,601,405	852,138,443		\$ 206,701,278	\$ 355,852,279	\$ 148,960	\$ 5,963,206	\$ 6,115,732	\$ 568,669,288
	2018 Network + NZUP	QT18NU.000	AM Peak	142,472	187,378	45.62	\$ 45,983	\$ 78,249	\$ -	\$ 1,413	\$ 1,413	\$ 125,645
			Inter Peak	146,925	197,101	44.72	\$ 47,492	\$ 82,309	\$ 2	\$ 1,607	\$ 1,610	\$ 131,411
			PM Peak	186,569	243,950	45.88	\$ 60,020	\$ 101,873	\$ 55	\$ 1,935	\$ 1,991	\$ 163,884
			Annual	630,184,578	839,318,788		\$ 203,483,029	\$ 350,498,061	\$ 40,019	\$ 6,743,886	\$ 6,787,471	\$ 560,768,560
	2028 Network Do Min	QT28NU.000	AM Peak	193,342	248,601	46.66	\$ 61,845	\$ 103,815	\$ 526	\$ 1,668	\$ 2,194	\$ 167,854
			Inter Peak	201,987	266,149	45.54	\$ 64,782	\$ 111,143	\$ 766	\$ 1,957	\$ 2,723	\$ 178,648
			PM Peak	250,611	321,119	46.83	\$ 79,834	\$ 134,099	\$ 756	\$ 2,311	\$ 3,067	\$ 217,000
			Annual	861,261,566	1,125,670,330		\$ 275,795,894	\$ 470,076,879	\$ 3,026,814	\$ 8,154,264	\$ 11,181,078	\$ 757,053,851
	2028 Network + NZUP	QT28NU.000	AM Peak	186,527	240,145	46.60	\$ 59,909	\$ 100,284	\$ 25	\$ 1,792	\$ 1,818	\$ 162,011
			Inter Peak	192,316	252,145	45.76	\$ 61,902	\$ 105,295	\$ 9	\$ 2,080	\$ 2,089	\$ 169,286
			PM Peak	242,729	308,873	47.15	\$ 77,520	\$ 128,985	\$ 93	\$ 2,312	\$ 2,406	\$ 208,911
			Annual	823,979,036	1,071,976,494		\$ 264,767,449	\$ 447,654,626	\$ 98,543	\$ 8,588,246	\$ 8,687,982	\$ 721,110,056
Updated 2048	2048 Network Do Min	QT48NU.000	AM Peak	256,917	342,173	45.05	\$ 82,531	\$ 142,891	\$ 1,696	\$ 2,721	\$ 4,417	\$ 229,839
			Inter Peak	281,417	379,757	44.46	\$ 90,505	\$ 158,586	\$ 1,302	\$ 3,197	\$ 4,499	\$ 253,590
			PM Peak	350,078	475,641	44.16	\$ 112,186	\$ 198,627	\$ 3,891	\$ 4,106	\$ 7,998	\$ 318,811
			Annual	1,193,377,530	1,609,810,710		\$ 383,492,805	\$ 672,254,733	\$ 7,221,364	\$ 13,523,965	\$ 20,745,950	\$ 1,076,493,489
	2048 Network + NZUP	QT48NU.000	AM Peak	250,153	331,923	45.22	\$ 80,639	\$ 138,611	\$ 478	\$ 2,812	\$ 3,291	\$ 222,541
			Inter Peak	271,970	368,882	44.24	\$ 87,866	\$ 154,044	\$ 367	\$ 3,344	\$ 3,712	\$ 245,622
			PM Peak	343,853	457,992	45.05	\$ 110,134	\$ 191,257	\$ 1,404	\$ 4,109	\$ 5,513	\$ 306,904
			Annual	1,157,812,197	1,560,952,886		\$ 373,362,022	\$ 651,850,306	\$ 2,226,117	\$ 14,010,970	\$ 16,240,606	\$ 1,041,452,934

Summary of Annualised Benefits from Strategic Modelling Of NZUP Option with Spatial Plan Landuse

Scenario	Year	Total Vehicle Operating Costs	Emissions Benefits (4% of VOC)	Total In Vehicle Time Cost	Total Additional Congestion	Accident Costs	PT Travel Time Benefits	Travel Time Reliability Costs (5% of TTC)	Total Network Operating Costs
Benefits	NZUP vs Do Min	2018	\$ 3,218,249	\$ 128,730	\$ 5,354,218	\$ 671,739	\$ 497,376	\$ 267,711	\$ 8,794,545
	NZUP vs Do Min	2028	\$ 11,028,446	\$ 441,138	\$ 22,422,253	\$ 2,493,096	\$ 2,021,440	\$ 1,121,113	\$ 39,527,486
	NZUP vs Do Min	2048	\$ 10,130,783	\$ 405,231	\$ 20,404,427	\$ 4,505,345	\$ 1,811,735	\$ 1,020,221	\$ 38,277,743

Un-normalised using standard Crash Compendium equations

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 19,373,158	\$ 23,404,238	\$ 42,777,396	
2018 Option	\$ 19,456,594	\$ 23,067,304	\$ 42,523,898	\$ 253,498
2028 Do min	\$ 23,418,842	\$ 31,169,488	\$ 54,588,330	
2028 Option	\$ 22,556,614	\$ 30,175,534	\$ 52,732,148	\$ 1,856,182
2048 Do min	\$ 30,903,586	\$ 42,097,604	\$ 73,001,190	
2048 Option	\$ 30,217,216	\$ 41,179,760	\$ 71,396,976	\$ 1,604,214

Normalised based on total Queenstown crashes in base year

Accident Costs	Intersection	Link	Total	Benefits
2018 Do min	\$ 9,686,579	\$ 37,446,781	\$ 47,133,360	
2018 Option	\$ 9,728,297	\$ 36,907,686	\$ 46,635,983	\$ 497,376
2028 Do min	\$ 11,709,421	\$ 49,871,181	\$ 61,580,602	
2028 Option	\$ 11,278,307	\$ 48,280,854	\$ 59,559,161	\$ 2,021,440
2048 Do min	\$ 15,451,793	\$ 67,356,166	\$ 82,807,959	
2048 Option	\$ 15,108,608	\$ 65,887,616	\$ 80,996,224	\$ 1,811,735

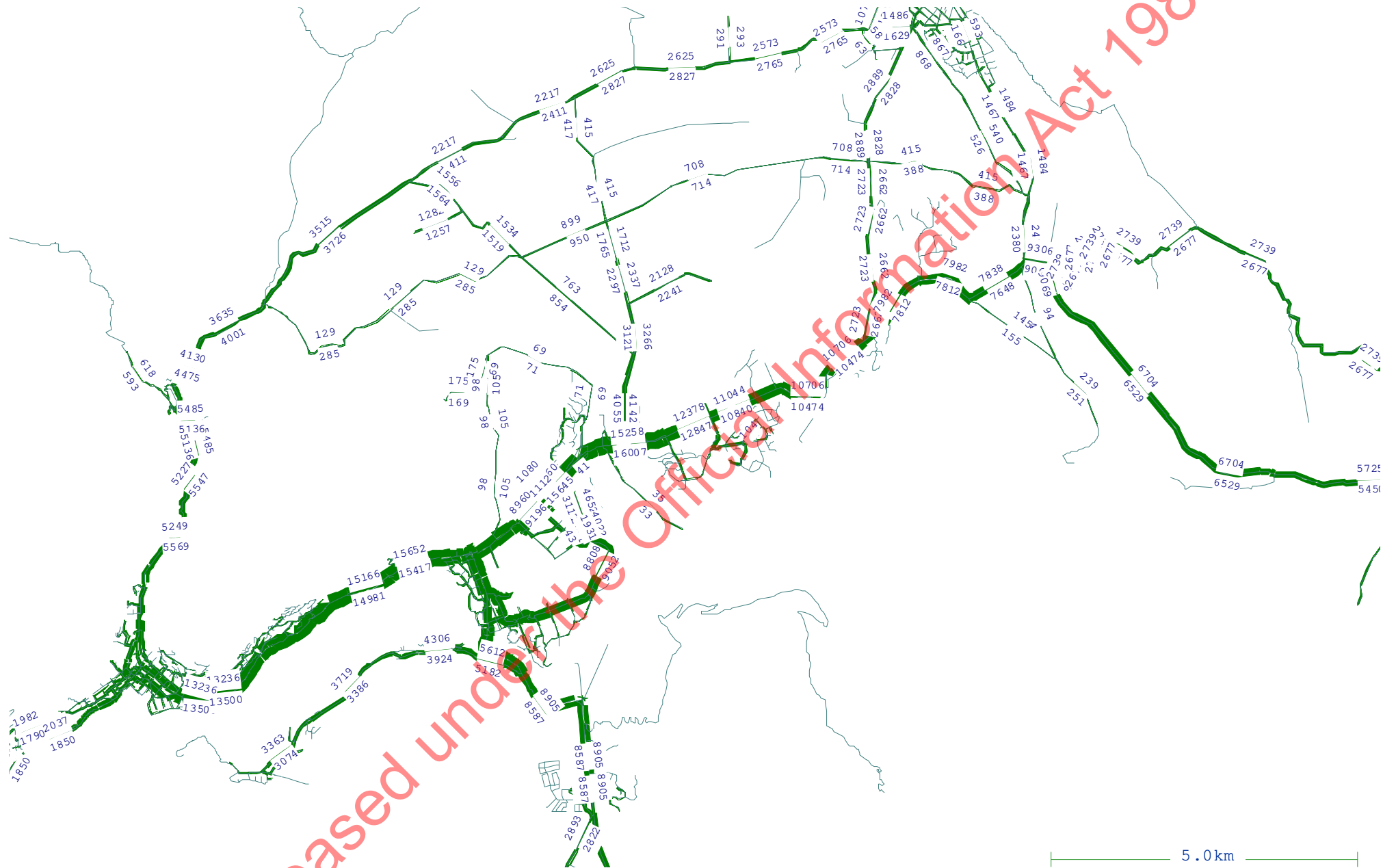
Calibration based on Queenstown Injury accidents 2009-19

Link	1.6
Intersection	0.5

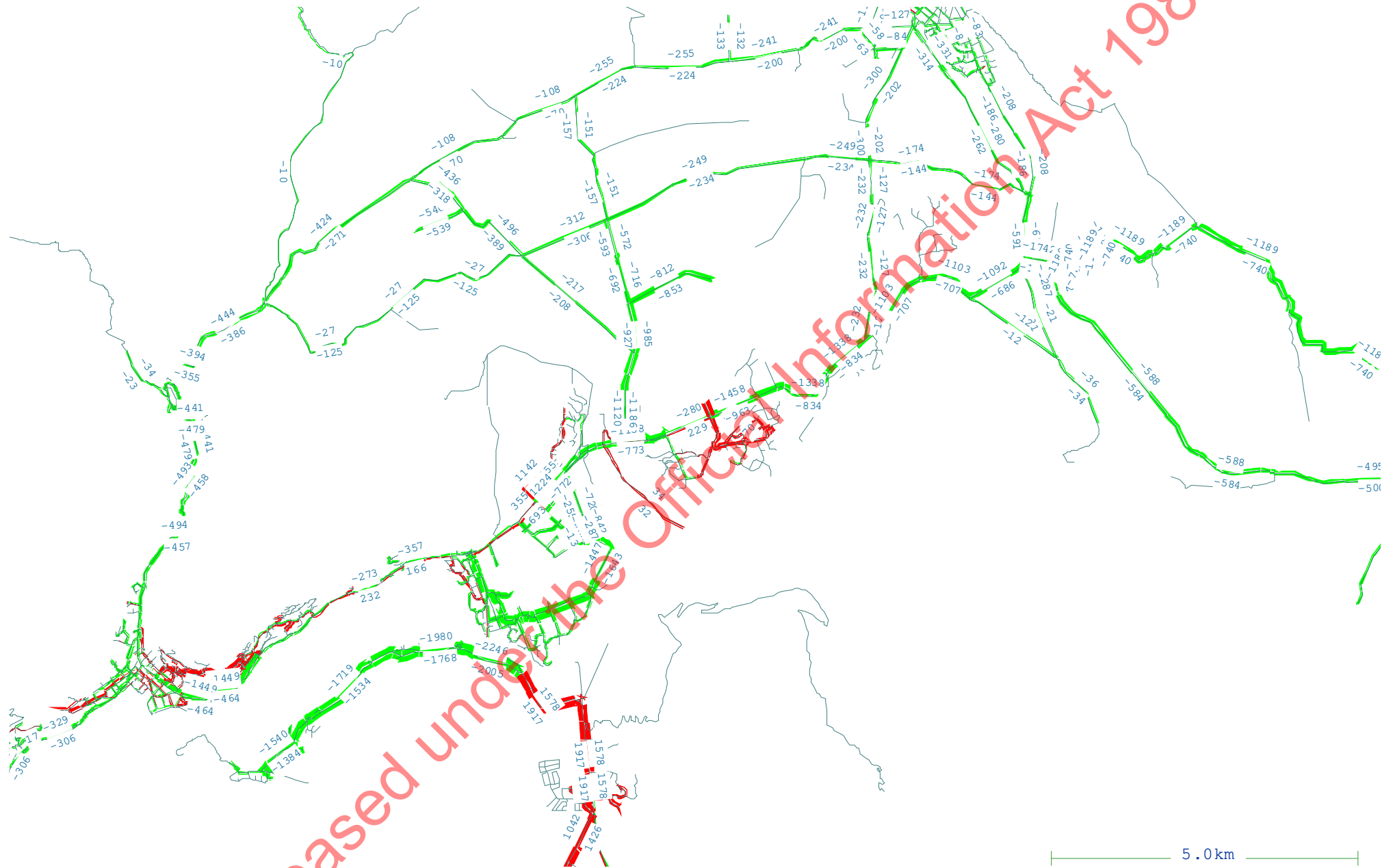
Appendix C

Spatial Plan Sensitivity Test Outputs

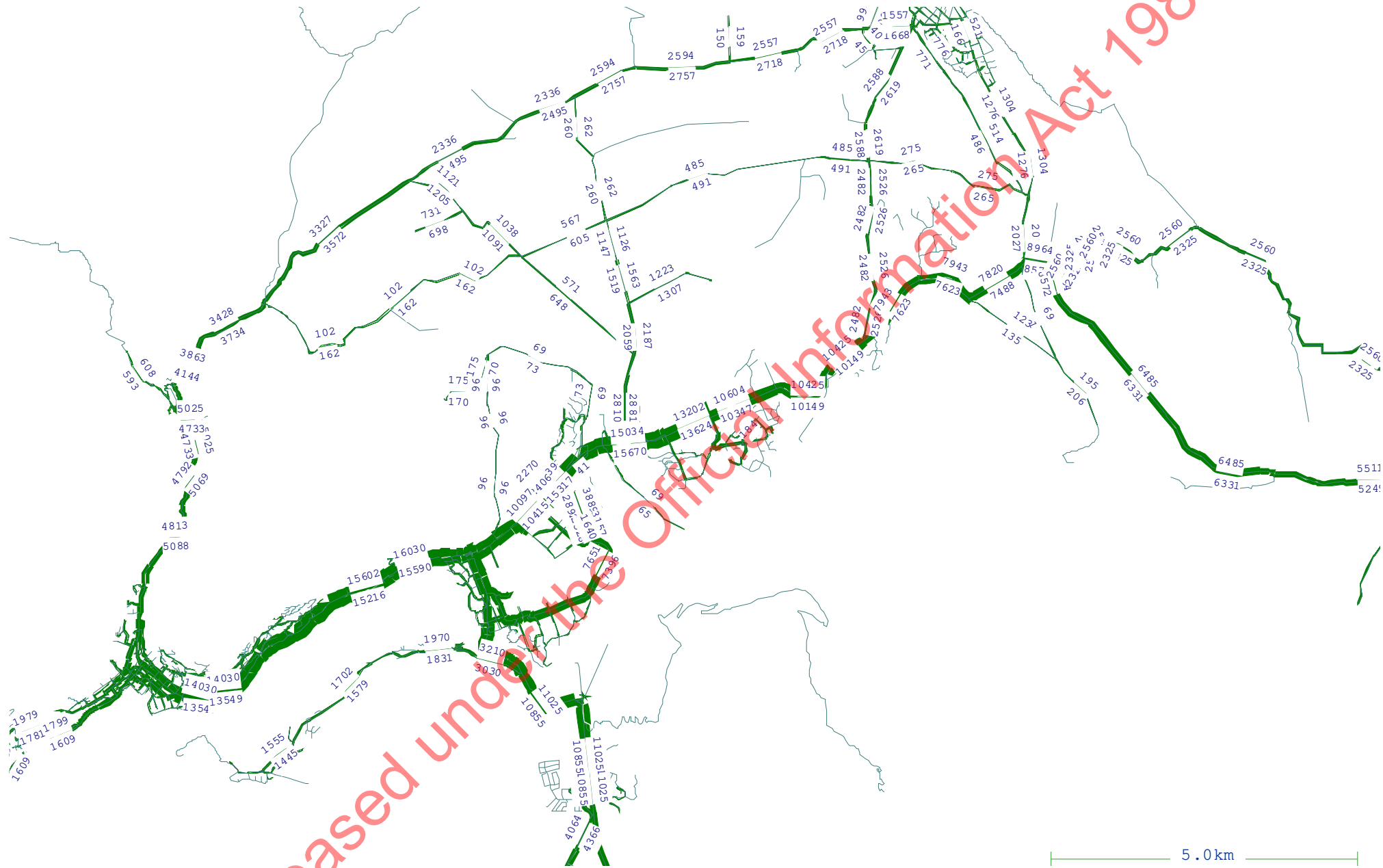




2048 All Day Traffic Volume – Business Case Future Baseline Scenario



2048 All Day Traffic Volume Change — Post COVID19 Growth Scenario compared to Business Case Baseline



2048 All Day Traffic Volume – Spatial Plan Preferred Scenario

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Wakatipu Basin Future Public Transport Demand Analysis

Technical Note 3b – Future Scenarios Update (Sept 2020)

Document History and Status

Revision	Date	Author	Reviewed by	Approved by	Status
1	13 Oct 2020	s 9(2)(a)	s 9(2)(a)	s 9(2)(a)	Draft
2	17 Nov 2020	s 9(2)(a)	s 9(2)(a)	s 9(2)(a)	Final

1 Introduction

This technical note sets out the methodology and results of the future scenario model assessments that were carried out for the Queenstown Town Centre, Frankton to Queenstown, and Frankton - Transport Business Case (the Business Case). Model outputs reported here include those used in the economic evaluation of the Business Case, and sensitivity tests carried out using demand sets updated to include the anticipated effects of COVID-19 and the Spatial Plan.

This tech note is preceded by **Technical Note 3 – Land Use, Demand and Capacity** (which covers the initial build and testing of the Future PT Model) and follow-up **Technical Note 3a** (which covers initial testing of shortlist options for the Business Case). This assessment follows the same general process in using a bespoke modelling tool to estimate the future PT requirements (both supply and demand) within the Wakatipu Basin, Queenstown.

This note concentrates on the variation in assumptions regarding generalised cost parameters, PT network provision and sensitivity demand sets; more detail on the original development and validation of this model is provided in the original technical note.

1.1 Overview

This technical note is split into 4 sections:

- Future demand sets
- Future scenarios
- Future model parameters
- Future scenario test results

2 Future Demand Sets

This tech note presents modelling from the Future PT Demand Model used for the Queenstown Transport Business Case economics. Additional modelling was subsequently undertaken for COVID-19 and Spatial Plan sensitivity tests, which is also presented here.

All future demand sets within the PT model are derived from the Tracks model as developed and maintained by Abley Transportation Consultants (ATC) on behalf of QLDC and Waka Kotahi NZ

Transport Agency. All base future demands have been fed directly from the 2028 and 2048 scenarios developed by ATC.

The ATC report 'Queenstown Lakes District Model: Business Case Modelling Report'. September 2020" update sets out the assumptions that underlie these future demand sets – this report also sets out some high-level results in terms of vehicle volumes on the network.

2.1 Sensitivity Tests

Updated land use forecasts from the Spatial Plan were not available for use in final forecasts for the Queenstown Transport Business Case, but sensitivity tests have since been undertaken using the preferred Spatial Plan growth forecasts. The forecasts include two 2048 scenarios:

- Preferred spatial plan forecast – includes the same quantum of residential, commercial and tourist activity growth as the base forecasts but with a different spatial distribution of growth. Most notably this includes more development in the vicinity of Jacks Point
- Post COVID-19 forecast – identical to the preferred spatial plan in terms of the spatial distribution of growth but includes a reduced level of tourist activity in line with post-COVID-19 forecasts issued by Utility consultants.

Changes in the preferred spatial plan scenario from the future base models presented in 'Queenstown Lakes District Model 2018 Update: Future Forecasting Report' include:

- Increases in households in southern corridor offset in part by lower growth at Kelvin Heights (net increase of +360HH) and small increases along eastern corridor (+140HH) and Arrowtown/Arthurs Point (+275HH).
- Decreases in residential development in Frankton urban area (-590HH).
- Increased growth in Wanaka township (+235HH) with a shift to less growth in the north and more in the west, and a reduction in households in the outlying Wanaka area (-360HH).

The changes in employment growth from the baseline are more pronounced and are as follows:

- Increases in jobs in southern corridor (net increase of +1760 jobs) and Frankton urban area (+1060 jobs).
- Decreases in employment in Queenstown urban area (-2580 jobs) and east of Shotover River (-200 jobs).
- Increased job growth in Wanaka township (+1000 jobs) with 1000 fewer jobs in outlying areas of the Wanaka ward.

Table 1 shows total car trips in the demand sets used for the Business Case and the COVID-19 and Spatial Plan sensitivity tests. The 2048SP figures refer to the Spatial Plan sensitivity test, which was only carried out for 2048.

Table 1: Total Matrix (car trips)

Year		2018	2028		2048		
Scenario		Business Case	Business Case	COVID-19	Business Case	COVID-19	Spatial Plan
AM Peak	Total trips	14851	22821	20834	30857	29680	29434
	Growth p.a.	-	5.4%	4.0%	1.8%	2.1%	1.5%
Interpeak	Total trips	14687	24639	22300	35559	34145	34017
	Growth p.a.	-	6.8%	5.2%	2.2%	2.7%	1.9%
PM peak	Total trips	17861	27142	25010	38382	38728	38329
	Growth p.a.	-	5.2%	4.0%	2.0%	2.7%	2.0%

3 Future Scenarios

3.1 General Method

The purpose of the model is to estimate the capture rate (or mode share) of public transport modes, given the future trip levels in 2028 and 2048 (and allow interpolation for intermediate years).

The process of running a future year model is summarised in the following steps:

- 1 Create a “PT interventions scenario” for a future year
- 2 PT intervention assumptions added into spreadsheet model (for example, reduced wait times for frequency improvements, additional MRT mode, reduced travel time due to bus lanes etc)
- 3 Spreadsheet model calculates the mode share between modes for each O-D journey pair, and outputs statistics on PT usage (per route) and vehicle assignment (per link)
- 4 Assign resultant vehicle matrix into spreadsheet to recalculate link travel times
- 5 Re-assign full trip matrix into spreadsheet model, and re-calculate the mode share between modes for each O-D journey pair, and outputs statistics on PT usage (per route) and vehicle assignment (per link)
- 6 Iterate between tasks 4 and 5 until convergence met (<1% change in overall PT mode share)

3.2 Future Scenarios Tested

All scenarios were tested at 2018 (for the purpose of economic evaluation), 2028 and 2048 future years, and for AM peak (0800-0900), Interpeak (1200-1300) and PM peak (1700-1800) hours.

Under the latest demand sets, the only infrastructure scenarios tested were Do Minimum and New Zealand Upgrade Programme (NZUP). The NZUP scenario most closely represents the Bus Max scenario reported previously. The PT network for NZUP is shown in Appendix A1.

An additional scenario, Gondola MRT, was tested under the previous round of demand sets but was omitted for implementability reasons before this update.

NZUP

The network is based on a ‘one-seat-ride’ philosophy, whereby main residential areas have a direct service (no transfers) to the Town Centre. Bus trips between the Town Centre and Quail Rise/Kelvin Heights require transfers at Frankton Flats or Remarkables Park. An improved multi-modal link utilising the Kelvin Heights-Town Centre ferry is intended to provide a secondary route to SH6A.

Key modelling assumptions:

- A reduced access time parameter has been used for Kelvin Heights to Town Centre ferry trips to account for the improved bus-ferry service
- At 2028, bus services to/from Ladies Mile have a headway of 15 minutes and alternate between the northern side and southern side of the highway, resulting in a bus every 30 minutes to/from the residential areas. At 2048, services to/from Ladies Mile have a headway of 10 minutes and alternate between the northern side and southern side of the highway, resulting in a bus every 20 minutes to/from the residential areas
- The 'Virtual Priority' option for bus priority along SH6A (refer to Queenstown Transport Business Case Tech Note 42 - SH6A (Frankton Road) Bus Signal and Virtual Priority) provides the equivalent travel time savings of full priority. Physical and signal priority is provided throughout Frankton Flats between the Shotover Bridge and south of Lucas Place on Kawarau Road. A westbound bus lane is provided on Ladies Mile in conjunction with a 'bus gate' for access onto the Shotover Bridge

The "virtual priority" option forms part of the preferred option for the Queenstown Town Centre, Frankton to Queenstown, and Frankton - Transport Business Case. The mechanics of the option include providing a 'green wave' through signal control for buses down SH6A and holding excess traffic demand prior to SH6A (i.e. in Frankton), where protected bus lanes are more cost effective to provide and less constrained by topography, geology and development. This would result in downstream intersections operating below capacity, thus reducing the chance of queues forming and buses getting held up.

It is likely that PT delay on SH6A will be greater than if full priority lanes were provided, due to buses accessing/egressing stops and re-joining traffic lanes. However, this level of increased delay is likely to be minimal, and therefore not have a significant impact on mode shift rates.

Previously Tested Scenarios

Option assessment for the business case included several High Capacity Public Transport scenarios:

- Bus Min
- Bus Max
- Trackless Tram (or similar Road-Based Higher Capacity Rapid Transit)
- Gondola MRT
- Ferry MRT

Testing under the previous round of modelling helped to identify Bus Max as the preferred option. The Trackless Tram option achieved the highest mode shift because of a lower 'mode penalty' but is largely interchangeable with the Bus Max option in terms of infrastructure. Feasibility issues with the Trackless Tram option led to Bus Max being preferred.

Therefore, only the Bus Max option (now the PT assumptions within the NZUP package) was tested with the updated demand sets.

3.3 Summary of Modelling Assumptions

A complete list of assumptions is set out in Table 2, with some additional detail in respect of the Park and Ride mode provided in the following section.

Table 2: Future Scenario Assumptions

Parameter	Sub-Parameter	2028 and 2048 Assumptions																											
Public Transport	Fares	bus \$2, ferry \$4.90 (free transfers)																											
	Services	Service levels (frequencies) have been optimised to a reasonable level (and within practical limits). The model does not include PT capacity values, but service frequencies have been set to be in line with the demand requirements (subject to minimum service levels of 30 minute frequencies at the low demand end, and maximum practical frequencies at the upper end)																											
	Transfer Penalty	Set at 5 minutes as a general "inconvenience" factor for any transfer between modes and/or services																											
	Wait Times	Set at 50% of the service headway, with a maximum cap of 15 minutes																											
	Mode Penalty	\$5 for bus (local and P&R); \$7 for water - factor to represent the perceived attractiveness of the mode (compared to a \$0 amount for private car)																											
	Water	Zone attraction is all walk-based (i.e. none operate as a drive-up and park service). No transfers are possible between water-based trips and other PT modes, principally due to the lack of convenient transfer points and the relatively low demand for such movements as a proportion of the whole matrix. All craft are assumed to be 40 seater.																											
	Local Bus	Allows walk up from each zone to the nearest allocated bus stop All standard services assumed to be conventional bus vehicles (40 seater) Bus Max services are assumed to be double decker or articulated bus with capacity of 100 As above, however, capacity of services is not an input into the model - the frequency/capacity of services are generally set to accommodate the demand (but this is not fully iterated to a convergent solution) Fare is as per bus service level (\$2), no parking charge applied at the sites. Bus-based service is express, stops at QTC and Frankton hub only. All services assumed to be conventional bus vehicles (40 seater).																											
Parking Cost	Park and Ride Sites	Attraction depends on the site: - QTC, Frankton Hub - allows walk-up and transfer from other PT - Ladies Mile - allows drive up from any zones east of the Shotover Bridge - Boyd Road - allows drive up from any zones south of the Kawarau Falls Bridge																											
	Parking Cost	Parking cost calculated as a weighted cost of pricing charge against parking availability at that price level, based on the Draft Parking Strategy (Nov 2018). No account taken of overall parking capacity, which could be done through further increasing of parking cost (as a proxy for parking supply/availability). Parking costs only apply to QTC, no charges applied elsewhere in the model																											
	Parking Cost	<table><thead><tr><th></th><th>Time Period/Year</th><th>2018</th><th>Previous 2028 Model</th><th>Previous 2048 Model</th><th>Updated 2028 Model</th><th>Updated 2048 Model</th></tr></thead><tbody><tr><td>1</td><td>AM Peak (inbound)</td><td>\$3.66</td><td>\$8.75</td><td>\$13.13</td><td>\$13.78</td><td>\$20.66</td></tr><tr><td>2</td><td>Interpeak (both directions)</td><td>\$2.21</td><td>\$3.58</td><td>\$5.37</td><td>\$7.52</td><td>\$11.28</td></tr><tr><td>3</td><td>PM Peak (outbound)</td><td>\$3.66</td><td>\$8.75</td><td>\$13.13</td><td>\$13.78</td><td>\$20.66</td></tr></tbody></table>		Time Period/Year	2018	Previous 2028 Model	Previous 2048 Model	Updated 2028 Model	Updated 2048 Model	1	AM Peak (inbound)	\$3.66	\$8.75	\$13.13	\$13.78	\$20.66	2	Interpeak (both directions)	\$2.21	\$3.58	\$5.37	\$7.52	\$11.28	3	PM Peak (outbound)	\$3.66	\$8.75	\$13.13	\$13.78
	Time Period/Year	2018	Previous 2028 Model	Previous 2048 Model	Updated 2028 Model	Updated 2048 Model																							
1	AM Peak (inbound)	\$3.66	\$8.75	\$13.13	\$13.78	\$20.66																							
2	Interpeak (both directions)	\$2.21	\$3.58	\$5.37	\$7.52	\$11.28																							
3	PM Peak (outbound)	\$3.66	\$8.75	\$13.13	\$13.78	\$20.66																							
Demand	QTC car access Times	2028 and 2048 access times doubled to represent provision of car parking to be further away from historic core																											
	General	Obtained from Tracks model for 2028 and 2048 scenarios																											
Limitations/Possible Sensitivities	Airport	Assumes terminal is on existing site, with 3.2m passenger movements at 2028 and 5.1m at 2048 in line with airport masterplan aspirations. One of the 2048 scenarios assumes continued impact from Covid-19 and reduced tourist numbers																											
	Demand segmentation	No segmentation of the demand, either by trip-purpose, or by willingness to pay																											
	Modes	As the original demand is 100% car based (from Tracks model), no active mode demands are included																											
	Peak spreading, trip suppression	None applied in PT model, is applied in strategic model																											
	Vehicle Occupancy	Set at a value of 1.3 throughout the model based on 2018 surveys																											
	TDM	Not currently applied. Would need to be applied as a proxy additional cost; by link, zone, or combination																											
	Do Minimum Assumptions	Currently 2028 and 2048 models have the following included: - Shotover Street and Stanley Street optimisation (Pedestrian crossing improvements/signalisation) - SH6A/Marina (signalised intersection, reduction in capacity) - Parking charges applied as per Option scenarios																											

3.3.1 Park and Ride

Park and Ride sites have been assumed at locations both South of Kawarau Falls Bridge and East of Shotover Bridge.

Bus-based Park and Ride sites have been assumed to be located (approximately) at:

- SH6/Howards Drive
- SH6/Boyd Road

In both cases, a transfer penalty of 5 minutes and an additional access time of 5 minutes (for road access, circulation, parking and walk to the interchange) has been applied for all trips using the facility. All bus-based services are assumed to be express, calling at Frankton hub (allowing transfers to other bus services) and Queenstown hub only.

It is important to note that all scenarios include a significant increase in parking cost in Queenstown Town Centre – as a reflection of both an increase in parking fee (ticket) and the limited availability of parking spaces (the growth in total trips to and from the town centre continues to grow through 2028 and 2048, whereas the total of public parking spaces is generally held constant at 2018 levels. Consequently, this is a major driver in the increased PT model share, particularly for trips that have an origin or destination in Queenstown Town Centre.

4 Model Results and Output

4.1 Scope of Output

The model is able to provide a rich level of output, similar to that provided by a more conventional (and more complicated) 4-stage transport model. This includes:

- Total trips per mode, by section, by service, by zone, by zone-to-zone movement
- Resultant mode share (and mode shift), by mode, by zone, by zone-to-zone movement
- Travel times, by section, by service, by zone-to-zone movement
- Traffic volumes, by section
- Passenger volumes and patronage (boarding, alighting, transfer and through) at each stop or hub, by mode, by service
- Above information provided by time period, by year, by scenario

As a result, this note does not provide an exhaustive supply of output data – instead a summary of the key outputs is provided.

A number of key points should be noted in relation to interpretation of the results:

- In terms of the v/c (volume/capacity) on certain parts of the network – it is not the case that it should be expected that all v/c values will tend towards 1.00 in all scenarios, and that PT modes will take extra trips above general traffic capacity. The generalised cost (logit) model calculates the relative worth of each O-D trip by each mode, and some congestion is required to encourage mode shift, but the actual shift will also be dependent on a number of other non-travel time related monetarised costs. As the PT modes become more attractive, the shift to PT increases
- In all scenarios, the base demand is retained without factoring. That is, no assumptions have been applied in respect of peak spreading, trip suppression due to congestion, increased vehicle occupancy, or greater share of active mode trips. In reality, some of these effects

would be encountered. However, this study, and the results presented below, assume that the full demand is applied

A more comprehensive set of results, including is presented in Appendix B.

4.2 Point Summaries

A point summary provides key output on the operation of the network in each period, year and scenario, and therefore is useful as a high-level summary of the mode share and operational performance at key locations in the network, namely:

- SH6A at Suburb Street
- Shotover Bridge
- Kawarau Falls Bridge

4.2.1 SH6A

Table 3 shows the 2028 SH6A point summary for the Business Case and Spatial Plan Sensitivity demand sets with Do Min and NZUP intervention scenarios (refer to Section 3.2); Table 4 shows the same for 2048. The 2048 point summary includes additional results for the COVID-19 sensitivity test demand set.

Values shown are person-trips, which are converted to vehicle trips for the v/c (volume/capacity) calculation, which is based on the approximate general traffic capacity at that point of the network. Differences in total trips between scenarios for the same demand set are a result of the model's limited route assignment function (Arrowtown – Town Centre car trips are assigned to Malaghans Road, whereas public transport trips for the same journey are assigned to SH6A).

Overall there are minor differences in results for SH6A between the Business Case and Spatial Plan demand sets, with a slight increase in peak direction demand and decrease in 'non-peak' direction demand in the Spatial Plan set. Despite a decrease in overall network trips in the Spatial Plan set, demand increases on SH6A in the peak direction as a result of intensification of jobs and homes in main centres. This is reflected by an increase in both car and public transport trips.

The v/c for the proposed NZUP option (82%-86%) shows that the proposed infrastructure and service improvements are adequate to keep SH6A operating below practical capacity (in combination with the parking control and management proposed for the Town Centre – refer to Table 2 for parking assumptions). In comparison, the Do Min scenario results in demand exceeding capacity. The relative increase in v/c in the Do Min scenario (7% in the PM peak) compared to the NZUP scenario (1% in the PM peak) for the Spatial Plan demand set also highlights the ability of the proposed NZUP package to sustainably manage growth and adapt to fluctuations in demand.

Results for 2048 show a similar trend to 2028, with the importance of improving the public transport network highlighted by demand exceeding capacity by up to 18% (interpeak eastbound) in the Do Min scenario. At 2048, the Spatial Plan demand sets have similar total network trips to the Business Case demand sets, but result in a slight increase in demand in the peak direction due to intensification of jobs and homes in the main centres. The impact of parking controls proposed in Queenstown Town Centre are more evident at 2048, with the AM inbound and PM outbound commuter trips to/from the Town Centre seeing a significantly larger shift to PT compared with other periods – this is caused by to lower parking costs in the Interpeak period (largely due to shorter stay periods) driven by the increased share of tourist-related trips outside of the commuter peaks. Notably, demand is expected to reach close to, or exceed, capacity in 2048 under all scenarios, even with more stringent parking controls and improvements to public transport.

Table 3: 2028 SH6A Point Summary

SH6A			Business Case Do Min		Spatial Plan Do Min		Business Case NZUP		Spatial Plan NZUP		
AM Peak	Eastbound	2028	Car	1294	90%	1160	91%	1277	88%	1153	89%
			Bus	129	9%	115	9%	159	11%	132	10%
			P&R	0	0%	0	0%	3	0%	3	0%
			MRT	0	0%	0	0%	0	0%	0	0%
			Water	7	1%	6	0%	5	0%	5	0%
			Total	1430	100%	1281	100%	1444	100%	1294	100%
			DoS	66%		59%		65%		59%	
	Westbound		Car	2049	84%	2130	83%	1605	62%	1628	60%
			Bus	366	15%	406	16%	599	23%	658	24%
			P&R	0	0%	0	0%	326	13%	376	14%
			MRT	0	0%	0	0%	0	0%	0	0%
			Water	25	1%	26	1%	41	2%	46	2%
			Total	2440	100%	2562	100%	2571	100%	2708	100%
			DoS	105%		109%		82%		83%	
PM Peak	Eastbound	Car	1976	72%	2112	73%	1617	56%	1641	54%	
		Bus	741	27%	734	25%	859	30%	899	30%	
		P&R	0	0%	0	0%	363	13%	433	14%	
		MRT	0	0%	0	0%	0	0%	0	0%	
		Water	45	2%	40	1%	47	2%	51	2%	
		Total	2762	100%	2886	100%	2886	100%	3024	100%	
		DoS	101%		108%		83%		84%		
	Westbound	Car	1708	95%	1623	94%	1546	84%	1484	85%	
		Bus	86	5%	93	5%	172	9%	157	9%	
		P&R	0	0%	0	0%	106	6%	105	6%	
		MRT	0	0%	0	0%	0	0%	0	0%	
		Water	3	0%	3	0%	8	0%	9	0%	
		Total	1797	100%	1720	100%	1832	100%	1754	100%	
		DoS	88%		83%		79%		76%		
Interpeak	Eastbound	Car	2155	91%	2113	91%	1702	70%	1683	71%	
		Bus	199	8%	198	9%	510	21%	486	20%	
		P&R	0	0%	0	0%	199	8%	190	8%	
		MRT	0	0%	0	0%	0	0%	0	0%	
		Water	10	0%	9	0%	24	1%	26	1%	
		Total	2364	100%	2320	100%	2435	100%	2384	100%	
		DoS	110%		108%		87%		86%		
	Westbound	Car	2100	94%	2072	93%	1630	71%	1652	72%	
		Bus	132	6%	142	6%	500	22%	460	20%	
		P&R	0	0%	0	0%	155	7%	147	6%	
		MRT	0	0%	0	0%	0	0%	0	0%	
		Water	10	0%	10	0%	23	1%	26	1%	
		Total	2243	100%	2224	100%	2308	100%	2285	100%	
		DoS	108%		106%		84%		85%		

Table 4: 2048 SH6A Point Summary

SH6A			Business Case Do Min		Spatial Plan Do Min		Business Case NZUP		Spatial Plan NZUP		Covid NZUP Spatial Plan	
AM Peak	Eastbound	Car	1317	90%	1346	90%	1338	91%	1355	90%	1399	90%
		Bus	129	9%	127	9%	131	9%	140	9%	143	9%
		P&R	0	0%	0	0%	3	0%	4	0%	4	0%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	18	1%	19	1%	4	0%	5	0%	5	0%
		Total	1464	100%	1492	100%	1476	100%	1504	100%	1551	100%
		DoS	68%		69%		69%		69%		72%	
	Westbound	Car	2143	70%	2150	69%	1666	51%	1658	49%	1672	49%
		Bus	851	28%	901	29%	1010	31%	1024	31%	1025	30%
		P&R	0	0%	0	0%	562	17%	614	18%	630	19%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	85	3%	71	2%	61	2%	58	2%	56	2%
		Total	3079	100%	3122	100%	3299	100%	3353	100%	3383	100%
		DoS	110%		110%		85%		85%		86%	
PM Peak	Eastbound	Car	2153	60%	2157	58%	1681	44%	1756	45%	1749	45%
		Bus	1276	36%	1419	38%	1425	38%	1401	36%	1391	36%
		P&R	0	0%	0	0%	613	16%	689	18%	687	18%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	148	4%	114	3%	72	2%	69	2%	68	2%
		Total	3577	100%	3690	100%	3791	100%	3915	100%	3895	100%
		DoS	110%		111%		86%		90%		90%	
	Westbound	Car	1960	97%	2033	96%	1700	82%	1774	82%	1805	82%
		Bus	63	3%	82	4%	209	10%	226	10%	229	10%
		P&R	0	0%	0	0%	150	7%	150	7%	168	8%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	5	0%	7	0%	9	0%	10	0%	10	0%
		Total	2028	100%	2121	100%	2069	100%	2161	100%	2212	100%
		DoS	100%		104%		87%		91%		93%	
Interpeak	Eastbound	Car	2169	76%	2307	77%	1875	63%	1978	64%	2001	63%
		Bus	665	23%	652	22%	715	24%	721	23%	737	23%
		P&R	0	0%	0	0%	339	11%	348	11%	392	12%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	29	1%	25	1%	46	2%	45	1%	45	1%
		Total	2863	100%	2984	100%	2974	100%	3093	100%	3175	100%
		DoS	111%		118%		96%		101%		103%	
	Westbound	Car	2222	84%	2180	80%	1837	67%	1897	67%	1897	67%
		Bus	388	15%	519	19%	658	24%	650	23%	661	23%
		P&R	0	0%	0	0%	207	8%	235	8%	236	8%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	47	2%	37	1%	40	1%	42	1%	42	1%
		Total	2657	100%	2736	100%	2743	100%	2824	100%	2836	100%
		DoS	114%		112%		94%		97%		97%	

4.2.2 SH6 Shotover Bridge

Table 5 shows the 2028 Shotover Bridge point summary for the Business Case and Spatial Plan Sensitivity demand sets with Do Min and NZUP intervention scenarios (refer to Section 3.2); Table 6 shows the same for 2048. The 2048 point summary includes additional results for the COVID-19 sensitivity test demand set.

Values shown are person-trips, which are converted to vehicle trips for the v/c (volume/capacity) calculation, which is based on the approximate general traffic capacity at that point of the network. Differences in total trips between scenarios for the same demand set are a result of the model's limited route assignment function (Arrowtown – Town Centre car trips are assigned to Malaghans Road, whereas public transport trips for the same journey are assigned to SH6A).

As might be expected, demand at Shotover Bridge is more tidal in nature (compared to SH6A, where there are high volumes in both directions across all periods), with a high westbound commuter volume in the AM peak, and corresponding eastbound volume in the PM peak.

Results from the Spatial Plan demand sets suggest that, despite an increase in trips to/from residential areas at Lake Hayes Estate and Shotover Country, overall peak demand across the Shotover Bridge is up to 10% lower than in the Business Case demand sets for 2028 due to lower growth and demand from the more rural areas to the east (Gibbston, Cromwell, Wanaka etc). This results in fewer car trips, even bringing the v/c in the Do Min scenario below 100%. Increased congestion on SH6A (refer to the SH6A Section) results in marginally higher public transport mode share from east of the Shotover Bridge (due to higher overall generalised cost for car journeys), further reducing v/c over the bridge. Total trips in the 2048 scenarios are consistent between the Business Case and Spatial Plan demand sets.

The public transport mode share at this point in the network is significantly lower than on the SH6A corridor, at a maximum of around 20% (compared to around 45% for SH6A at 2028). This is largely due to the impact of the Frankton area, which makes up a large proportion of trips to/from the East; the Frankton area is generally more difficult to serve by all PT modes (compared to Queenstown Town Centre), due to the spread out nature of the land use, and the need to transfer between PT services at least once for most journeys. In addition, the lack of parking control means that, in generalised cost terms, it is still more attractive for most journeys to and from Frankton to be carried out by private car in spite of congestion (and delay) on the road network. In reality, this will have a secondary impact on the chosen mode for trips to and from Queenstown Town Centre, as multi-journey trips to both Frankton and Queenstown will have a disparity in the favoured mode.

Results for 2048 show a similar trend to 2028, with v/c for the NZUP scenario up to 13% lower than the Do Min. It can be seen that the v/c results at 2048 are marginally higher than at 2028 for the option scenarios, which demonstrates the increase in congestion at 2048, but also the relative increase in attractiveness of PT. Notably, car demand is forecast to exceed capacity by 2048, at least in the PM peak, even with NZUP infrastructure and public transport interventions. This is primarily due to the lack of parking restrictions in Frankton as described earlier in this section.

Table 5: 2028 SH6 Shotover Bridge Point Summary

Shotover Bridge			Business Case Do Min		Spatial Plan Do Min		Business Case NZUP		Spatial Plan NZUP	
AM Peak	Eastbound	Car	921	97%	859	97%	1044	97%	978	97%
		Bus	31	3%	30	3%	26	2%	25	2%
		P&R	0	0%	0	0%	4	0%	5	0%
		LM MRT	0	0%	0	0%	0	0%	0	0%
		LH MRT	0	0%	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%	0	0%
		Total	952	100%	890	100%	1074	100%	1008	100%
		DoS	42%		39%		47%		44%	
	Westbound	Car	2155	96%	1932	95%	1958	83%	1713	79%
		Bus	100	4%	108	5%	147	6%	165	8%
		P&R	0	0%	0	0%	267	11%	283	13%
		LM MRT	0	0%	0	0%	0	0%	0	0%
		LH MRT	0	0%	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%	0	0%
		Total	2256	100%	2040	100%	2372	100%	2161	100%
		DoS	98%		87%		89%		78%	
PM Peak	Eastbound	Car	2355	93%	2135	93%	2079	81%	1850	78%
		Bus	168	7%	172	7%	190	7%	212	9%
		P&R	0	0%	0	0%	298	12%	317	13%
		LM MRT	0	0%	0	0%	0	0%	0	0%
		LH MRT	0	0%	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%	0	0%
		Total	2522	100%	2307	100%	2567	100%	2379	100%
		DoS	107%		97%		94%		84%	
	Westbound	Car	1557	99%	1435	98%	1423	88%	1312	88%
		Bus	17	1%	24	2%	57	4%	56	4%
		P&R	0	0%	0	0%	135	8%	126	8%
		LM MRT	0	0%	0	0%	0	0%	0	0%
		LH MRT	0	0%	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%	0	0%
		Total	1574	100%	1460	100%	1615	100%	1493	100%
		DoS	70%		65%		64%		59%	
Interpeak	Eastbound	Car	1434	98%	1292	97%	1386	88%	1260	88%
		Bus	33	2%	37	3%	43	3%	45	3%
		P&R	0	0%	0	0%	149	9%	132	9%
		LM MRT	0	0%	0	0%	0	0%	0	0%
		LH MRT	0	0%	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%	0	0%
		Total	1468	100%	1329	100%	1578	100%	1437	100%
		DoS	65%		58%		63%		57%	
	Westbound	Car	1358	98%	1229	98%	1244	85%	1128	85%
		Bus	24	2%	29	2%	69	5%	73	6%
		P&R	0	0%	0	0%	146	10%	126	9%
		LM MRT	0	0%	0	0%	0	0%	0	0%
		LH MRT	0	0%	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%	0	0%
		Total	1383	100%	1258	100%	1459	100%	1327	100%
		DoS	61%		56%		56%		51%	

Table 6: 2048 SH6 Shotover Bridge Point Summary

Shotover Bridge			Business Case Do Min		Spatial Plan Do Min		Business Case NZUP		Spatial Plan NZUP		Covid NZUP Spatial Plan	
AM Peak	Eastbound	Car	1308	97%	1150	97%	1202	96%	1044	95%	1108	95%
		Bus	40	3%	40	3%	45	4%	45	4%	45	4%
		P&R	0	0%	0	0%	7	1%	9	1%	9	1%
		LM MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		LH MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%	0	0%	0	0%
		Total	1349	100%	1189	100%	1254	100%	1097	100%	1162	100%
	Westbound	DoS	59%		52%		54%		47%		50%	
		Car	2284	88%	2276	87%	2103	78%	2094	77%	2106	76%
		Bus	305	12%	353	13%	196	7%	226	8%	228	8%
		P&R	0	0%	0	0%	412	15%	414	15%	437	16%
		LM MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		LH MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%	0	0%	0	0%
PM Peak	Eastbound	Total	2589	100%	2629	100%	2712	100%	2735	100%	2771	100%
		DoS	103%		103%		95%		95%		95%	
		Car	2599	87%	2588	84%	2300	75%	2290	73%	2280	73%
		Bus	389	13%	511	16%	272	9%	344	11%	335	11%
		P&R	0	0%	0	0%	487	16%	499	16%	500	16%
		LM MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		LH MRT	0	0%	0	0%	0	0%	0	0%	0	0%
	Westbound	Water	0	0%	0	0%	0	0%	0	0%	0	0%
		Total	2988	100%	3099	100%	3059	100%	3134	100%	3115	100%
		DoS	118%		117%		104%		104%		103%	
		Car	2075	98%	1952	98%	1917	89%	1792	88%	1868	88%
		Bus	41	2%	43	2%	66	3%	75	4%	76	4%
		P&R	0	0%	0	0%	181	8%	169	8%	188	9%
		LM MRT	0	0%	0	0%	0	0%	0	0%	0	0%
Interpeak	Eastbound	LH MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%	0	0%	0	0%
		Total	2116	100%	1995	100%	2164	100%	2036	100%	2132	100%
		DoS	94%		88%		87%		81%		85%	
		Car	1907	95%	1736	94%	1664	80%	1466	76%	1555	75%
		Bus	103	5%	108	6%	154	7%	175	9%	177	9%
		P&R	0	0%	0	0%	264	13%	290	15%	336	16%
	Westbound	LM MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		LH MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%	0	0%	0	0%
		Total	2010	100%	1844	100%	2082	100%	1932	100%	2068	100%
		DoS	86%		79%		75%		66%		70%	
		Car	1807	97%	1655	93%	1697	87%	1587	84%	1614	85%
		Bus	55	3%	130	7%	92	5%	110	6%	106	6%
		P&R	0	0%	0	0%	165	8%	186	10%	189	10%
		LM MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		LH MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%	0	0%	0	0%
		Total	1863	100%	1785	100%	1953	100%	1882	100%	1909	100%
		DoS	82%		75%		77%		72%		73%	

4.2.3 SH6 Kawarau Falls Bridge

Table 7 shows the 2028 Kawarau Falls Bridge point summary for the Business Case and Spatial Plan Sensitivity demand sets with Do Min and NZUP intervention scenarios (refer to Section 3.2); Table 8 shows the same for 2048. The 2048 point summary includes additional results for the COVID-19 sensitivity test demand set.

Values shown are person-trips, which are converted to vehicle trips for the v/c (volume/capacity) calculation, which is based on the approximate general traffic capacity at that point of the network.

As at the Shotover Bridge, demand at Kawarau Falls Bridge is tidal in nature, with a high northbound commuter volume in the AM peak, and corresponding southbound volume in the PM peak. Changes in demand in the Spatial Plan set reflect the reduction in development forecast for Kelvin Heights, partially offset by increased development in the vicinity of Jacks Point.

With the planned intensification of development around Jacks Point, by 2028 forecast travel demand and public transport mode shares are similar to those on the Shotover Bridge. The forecast public transport mode share at these peripheral points of the network are low relative to SH6A, at a maximum of around 25%. This is largely due to the impact of unrestricted and free parking in the Frankton area, which make up a proportion of trips to/from the south and east.

Results for 2048 show a similar trend to 2028, with v/c in the NZUP scenario up to 11% lower than the Do Min. It can be seen that the v/c results at 2048 are marginally higher than at 2028 for the NZUP scenarios, which demonstrates the increase in congestion at 2048, and the relative increase in attractiveness of PT.

At 2048, the v/c results show that private car demand is around 80% capacity for the commuter peak direction. Under the Do Min scenario, delays and queueing would be highly likely as a result of v/c being above 90%, and indicates that the bridge has lower residual capacity than previously expected before intense development was planned for the southern corridor.

Table 7: 2028 SH6 Kawarau Bridge Point Summary

KFB			Business Case Do Min		Spatial Plan Do Min		Business Case NZUP		Spatial Plan NZUP		
AM Peak	Northbound	2028	Car	1571	95%	1388	95%	1256	80%	1118	77%
			Bus	67	4%	63	4%	175	11%	178	12%
			P&R	0	0%	0	0%	133	8%	153	11%
			MRT	0	0%	0	0%	0	0%	0	0%
			Water	11	1%	9	1%	12	1%	11	1%
			Total	1648	100%	1460	100%	1575	100%	1460	100%
			DoS	64%		56%		51%		45%	
	Southbound		Car	800	97%	627	97%	698	93%	597	92%
			Bus	21	3%	21	3%	27	4%	26	4%
			P&R	0	0%	0	0%	27	4%	25	4%
			MRT	0	0%	0	0%	0	0%	0	0%
			Water	1	0%	1	0%	2	0%	2	0%
			Total	822	100%	649	100%	754	100%	649	100%
			DoS	32%		25%		28%		24%	
PM Peak	Northbound	Car	1002	99%	857	98%	836	88%	765	88%	
		Bus	10	1%	14	1%	57	6%	53	6%	
		P&R	0	0%	0	0%	53	6%	52	6%	
		MRT	0	0%	0	0%	0	0%	0	0%	
		Water	1	0%	1	0%	3	0%	2	0%	
		Total	1013	100%	872	100%	949	100%	872	100%	
		DoS	41%		35%		34%		31%		
	Southbound	Car	1519	92%	1386	91%	1304	78%	1159	76%	
		Bus	109	7%	128	8%	149	9%	153	10%	
		P&R	0	0%	0	0%	197	12%	201	13%	
		MRT	0	0%	0	0%	0	0%	0	0%	
		Water	24	1%	11	1%	14	1%	13	1%	
		Total	1652	100%	1525	100%	1665	100%	1525	100%	
		DoS	61%		56%		53%		47%		
Interpeak	Northbound	Car	945	99%	875	99%	813	86%	752	86%	
		Bus	4	0%	4	0%	67	7%	64	7%	
		P&R	0	0%	0	0%	64	7%	58	7%	
		MRT	0	0%	0	0%	0	0%	0	0%	
		Water	2	0%	2	0%	5	1%	5	1%	
		Total	951	100%	881	100%	949	100%	879	100%	
		DoS	38%		35%		33%		30%		
	Southbound	Car	964	99%	884	99%	791	81%	716	80%	
		Bus	9	1%	10	1%	76	8%	78	9%	
		P&R	0	0%	0	0%	103	11%	96	11%	
		MRT	0	0%	0	0%	0	0%	0	0%	
		Water	2	0%	1	0%	6	1%	6	1%	
		Total	975	100%	895	100%	976	100%	896	100%	
		DoS	39%		36%		32%		29%		

Table 8: 2048 SH6 Kawarau Bridge Point Summary

KFB			Business Case Do Min		Spatial Plan Do Min		Business Case NZUP		Spatial Plan NZUP		Covid NZUP Spatial Plan	
AM Peak	Northbound	Car	2367	91%	2180	93%	1856	74%	1714	73%	1698	73%
		Bus	184	7%	133	6%	400	16%	329	14%	325	14%
		P&R	0	0%	0	0%	224	9%	282	12%	275	12%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	48	2%	26	1%	27	1%	16	1%	15	1%
		Total	2599	100%	2340	100%	2507	100%	2340	100%	2313	100%
		DoS	96%		88%		75%		69%		69%	
	Southbound	Car	1093	97%	958	96%	900	95%	938	94%	945	94%
		Bus	32	3%	32	3%	23	2%	28	3%	28	3%
		P&R	0	0%	0	0%	27	3%	28	3%	28	3%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	6	1%	5	1%	2	0%	1	0%	1	0%
		Total	1130	100%	995	100%	951	100%	995	100%	1002	100%
		DoS	44%		39%		36%		38%		38%	
PM Peak	Northbound	Car	1384	98%	1261	97%	1148	86%	1108	85%	1107	85%
		Bus	32	1%	34	1%	92	7%	91	7%	93	7%
		P&R	0	0%	0	0%	86	6%	96	7%	98	8%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	3	0%	2	0%	4	0%	3	0%	3	0%
		Total	1419	100%	1297	100%	1331	100%	1297	100%	1301	100%
		DoS	56%		51%		46%		45%		45%	
	Southbound	Car	2255	83%	2142	83%	2042	74%	1898	74%	1885	73%
		Bus	384	14%	399	15%	348	13%	255	10%	254	10%
		P&R	0	0%	0	0%	320	12%	412	16%	412	16%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	84	3%	40	2%	31	1%	16	1%	16	1%
		Total	2723	100%	2581	100%	2741	100%	2582	100%	2567	100%
		DoS	91%		87%		83%		77%		76%	
Interpeak	Northbound	Car	1518	97%	1552	98%	1314	84%	1318	84%	1322	84%
		Bus	26	1%	18	1%	141	9%	127	8%	126	8%
		P&R	0	0%	0	0%	89	6%	124	8%	123	8%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	18	1%	11	1%	15	1%	9	1%	9	1%
		Total	1562	100%	1580	100%	1559	100%	1578	100%	1580	100%
		DoS	61%		63%		53%		53%		54%	
	Southbound	Car	1513	95%	1529	96%	1305	82%	1286	80%	1283	80%
		Bus	62	4%	66	4%	149	9%	126	8%	127	8%
		P&R	0	0%	0	0%	116	7%	179	11%	179	11%
		MRT	0	0%	0	0%	0	0%	0	0%	0	0%
		Water	10	1%	5	0%	15	1%	9	1%	9	1%
		Total	1585	100%	1600	100%	1586	100%	1601	100%	1598	100%
		DoS	61%		62%		53%		52%		52%	

5 Key Results

Key results from the latest round of modelling are given below:

- At the Shotover Bridge, all options are forecast to have a lower share of trips (compared to SH6A), predominantly due to the limitations of PT connectivity and lack of parking control within Frankton
- Despite v/c for the Do Min scenarios being above 100%, there is potential for demand to further exceed capacity if parking charges in Queenstown Town Centre are not adopted as assumed in the models
- The combination of the increased parking charge in Queenstown Town Centre and improved public transport means that the degree of saturation on SH6A is below 100% in both 2028 and 2048 for the NZUP option, except in the Interpeak. Sensitivity tests show that at 75% of the assumed parking cost (which represents both a parking charge and a parking availability cost), the degree of saturation on Frankton Road approaches 100%, demonstrating that the parking strategy is a key tool in the ability to increase model shift to PT for Town Centre trips
- On Kawarau Falls Bridge, PT share is modest at 2028 due to lower levels of congestion on the trip to and from Frankton (and therefore less incentive to shift to a PT mode). At 2048, the operation of the road network begins to approach capacity, with higher resultant PT share
- The lack of parking controls (either supply of demand levers) in Frankton results in a greater deterioration in performance in this part of the network, compared to Queenstown Town Centre – which presents a significant issue, particularly at 2048 when traffic demand is high, but PT alternatives are still (relatively) unattractive in cost terms
- Overall the Spatial Plan and COVID-19 sensitivity demand sets have limited impact on projected public transport patronage. While total trips are expected to reduce, key parts of the network, such as SH6A, retain relatively high volumes, which drives a large proportional demand for PT

6 Conclusions and Next Steps

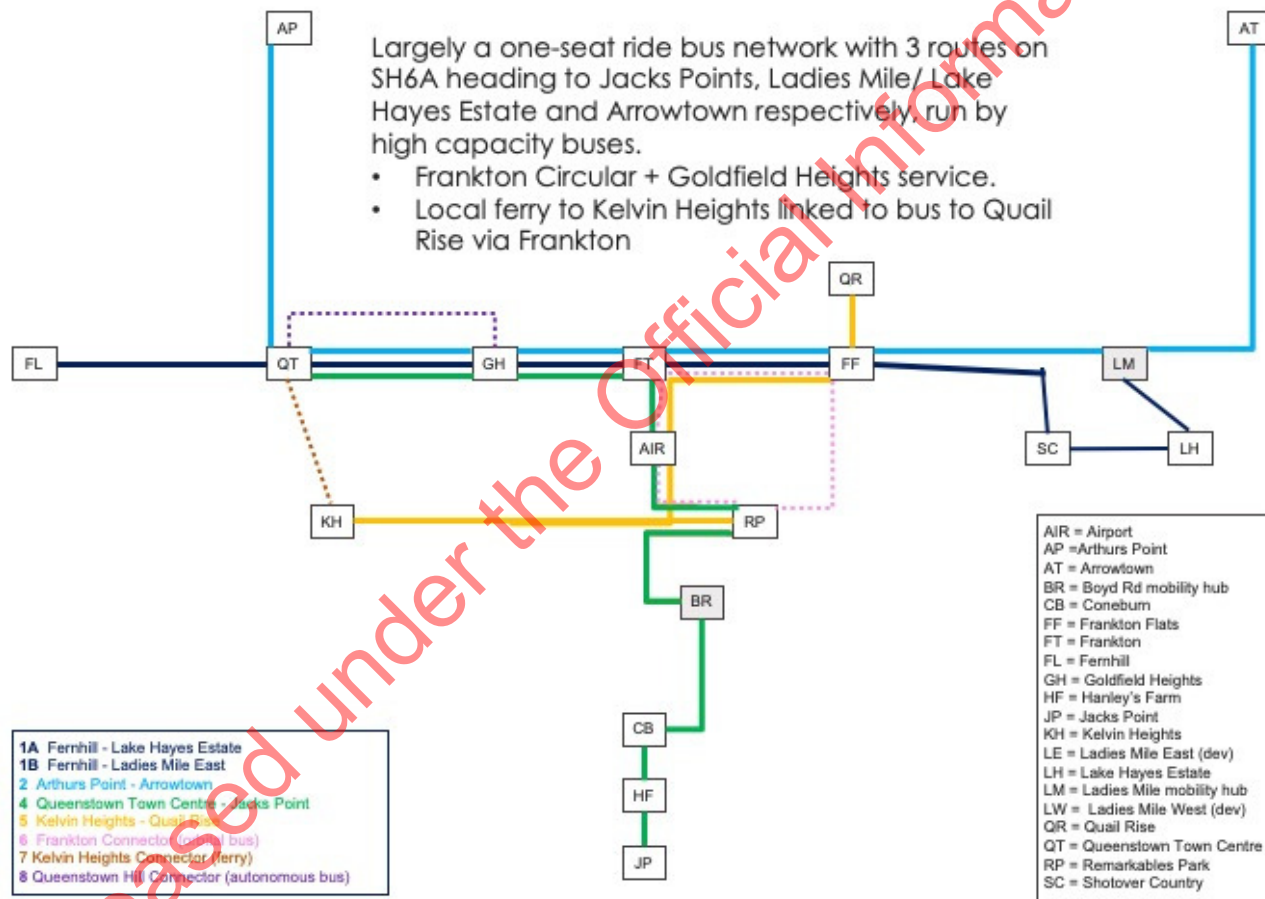
With the updated demand sets, the NZUP option retains a high degree of mode shift above the Do Min scenarios, particularly as congestion worsens (i.e. at 2048).

As much as “carrots” (improved public transport infrastructure and services) are needed to manage car volumes, “sticks” such as parking control appear to be critical. Generally speaking, the convenience offered by the private car outweighs the benefits offered by public transport, even with travel time savings, when considering wait times, transfers and mode penalties. This is particularly evident in the model at the Shotover Bridge and Kawarau Falls Bridge, where, despite fairly significant travel time savings through PT modes, demand for car travel remains high because of the unrestricted free parking in Frankton.

Results for the Shotover Bridge also show the importance of land use, density and accessibility to public transport. It is clear that even with an optimised high-frequency option, the land use and first mile/last mile access assumed on Ladies Mile does not sufficiently support public transport. This also emphasises the need to ensure housing areas to the south are designed with public transport as a priority so as to provide future-proofing of the transport system serving this area.

Appendix A1 - NZUP PT Network

Bus Max



Appendix B1 – Model Outputs – Business Case Demand Sets Hub Passenger Movement Summary

	Hub Passenger Movements		Queenstown Hub				Frankton Hub				Airport	
			Boarding/ Alighting Bus	Transfers	Transfer to/from Bus	Total People Movements	Boarding/ Alighting Bus	Transfers	Bus only Transfer	Total People Movements	Alighting	Boarding
2018	Base	AM	171	9	9	180	52	13	13	65	10	5
		IP	90	2	2	92	16	7	7	23	4	3
		PM	178	7	7	185	44	12	12	57	4	6
	Bus Max	AM	365	21	21	386	69	27	27	96	15	11
		IP	336	13	13	349	59	29	29	88	16	16
		PM	357	21	21	378	72	28	28	100	9	12
2028	Base	AM	562	12	12	573	148	42	42	190	22	23
		IP	287	2	2	289	52	23	23	75	10	11
		PM	776	9	9	786	169	71	71	240	28	17
	Bus Max	AM	1085	29	29	1114	171	81	81	252	40	37
		IP	1022	23	23	1045	219	106	106	326	53	53
		PM	1427	35	35	1461	246	120	120	365	45	47
2048	Base	AM	1086	13	13	1099	232	93	93	324	37	58
		IP	787	5	5	792	183	86	86	269	61	60
		PM	1473	12	12	1486	241	134	134	374	63	43
	Bus Max	AM	1654	23	23	1677	214	126	126	339	47	61
		IP	1486	28	28	1513	268	148	148	416	81	116
		PM	2299	41	41	2339	336	198	198	533	70	93

Appendix B2 – Model Outputs – Spatial Plan Sensitivity Hub Passenger Movement Summary

	Hub Passenger Movements		Queenstown Hub				Frankton Hub				Airport	
			Boarding/ Alighting Bus	Transfers	Transfer to/from Bus	Total People Movements	Boarding/ Alighting Bus	Transfers	Bus only Transfer	Total People Movements	Alighting	Boarding
2018	Base	AM	171	9	9	180	52	13	13	65	10	5
		IP	90	2	2	92	16	7	7	23	4	3
		PM	178	7	7	185	44	12	12	57	4	6
2028	Base	AM	604	12	12	616	123	42	42	165	16	18
		IP	306	2	2	308	40	21	21	61	7	8
		PM	840	10	10	850	139	73	73	212	19	12
	Bus Max	AM	1160	26	26	1186	147	79	79	225	29	29
		IP	1008	20	20	1028	171	91	91	262	38	42
		PM	1535	34	34	1569	209	117	117	325	35	36
2048	Base	AM	1152	13	13	1165	195	91	91	286	32	47
		IP	877	6	6	883	176	88	88	264	42	67
		PM	1661	14	14	1675	213	150	150	363	48	49
	Bus Max	AM	1700	22	22	1722	189	115	115	305	46	47
		IP	1535	29	29	1564	256	139	139	395	70	106
		PM	2359	39	39	2399	299	176	176	475	53	93

Appendix B2 – Model Outputs – O-D Summary

Released under the Official Information Act 1982

2018 Base AM

BUS PASSENGERS (SHARE)**FERRY PASSENGERS (SHARE**

P&R PASSENGERS (SHARE)

[illegible]

[illegible]

2018 Base IP

BUS PASSENGERS (SHARE)

FERRY PASSENGERS (SHARE)

P&R PASSENGERS (SHARE)

[illegible]

[illegible][illegible]

2018 Base PM

BUS PASSENGERS (SHARE)**FERRY PASSENGERS (SHARE**

P&R PASSENGERS (SHARE)

[illegible]

[illegible]

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	14	5	5	7	63	9	9	4	7	6	1	77	9	41	15	273
Arrowtown	39	0	77	19	60	254	30	103	44	15	95	14	357	21	105	27	1260
Arthurs Point	5	49	0	18	6	32	14	8	38	4	6	1	324	3	17	4	529
Fernhill	9	14	23	0	8	61	21	10	47	3	4	1	629	5	11	11	857
Five Mile	16	31	4	4	0	139	14	47	7	6	19	6	76	12	10	9	400
Frankton	150	126	23	26	136	0	90	198	40	59	74	22	496	113	45	64	1661
Frankton Rd	28	29	17	22	23	167	0	32	40	9	14	5	460	17	14	11	888
Glenda Dr	8	25	3	3	25	99	9	0	4	5	16	4	44	10	15	12	282
Gorge Road	4	11	16	18	5	30	13	6	0	2	3	1	266	3	6	5	390
Kelvin Heights	44	27	7	6	21	217	20	36	11	0	10	4	139	43	13	8	607
LHE/Shotover Country	54	221	27	10	79	330	35	148	20	12	0	22	223	19	16	15	1232
Quail Rise	9	19	3	2	14	56	6	21	3	2	12	0	37	5	3	2	193
Town Centre	64	140	177	207	56	406	148	69	217	34	32	10	0	45	132	109	1847
Jacks Point	66	34	8	9	34	334	30	54	16	34	15	6	193	0	0	17	852
East External	30	139	22	13	42	232	22	34	13	15	20	5	200	0	0	0	786
South External	12	17	2	6	6	53	7	9	9	6	5	1	88	15	76	0	313
Total	540	896	413	371	521	2475	470	784	512	212	330	102	3610	321	506	308	12370

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	5	1	0	0	0	0	0	24	1	0	0	32
Arrowtown	1	0	2	0	1	3	1	1	1	0	1	0	28	0	0	0	41
Arthurs Point	0	2	0	0	0	1	0	0	2	0	0	0	67	0	0	0	72
Fernhill	1	0	1	0	0	5	2	0	2	0	0	0	248	0	0	0	260
Five Mile	0	0	0	0	0	1	0	0	0	0	0	0	4	0	0	0	7
Frankton	6	2	0	1	2	0	5	3	1	3	3	0	98	4	0	0	128
Frankton Rd	3	2	1	2	1	17	0	1	4	0	1	0	163	1	0	0	196
Glenda Dr	0	0	0	0	0	1	0	0	0	0	0	0	3	0	0	0	4
Gorge Road	0	0	1	1	0	1	1	0	0	0	0	0	71	0	0	0	75
Kelvin Heights	3	0	0	0	1	13	1	2	0	0	0	0	19	2	0	0	40
LHE/Shotover Country	3	5	0	0	2	18	1	5	0	0	0	0	31	1	0	0	68
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3
Town Centre	9	13	27	35	3	63	24	8	38	2	2	1	0	4	0	0	230
Jacks Point	2	0	0	0	1	11	0	1	0	0	0	0	12	0	0	0	29
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	28	26	33	40	11	139	35	23	49	6	8	3	768	15	0	0	1185

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	4
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	13
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	1	0	0	0	0	0	0	9	0	0	0	11
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	1	3	2	0	0	1	0	0	3	0	0	0	10
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	4	3	1	0	1	0	0	28	0	0	0	39

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	14	5	5	7	63	9	9	4	7	6	1	77	9	41	15	273
Arrowtown	39	0	77	19	60	254	30	103	44	15	95	14	357	21	105	27	1260
Arthurs Point	5	49	0	18	6	32	14	8	38	4	6	1	324	3	17	4	529
Fernhill	9	14	23	0	8	61	21	10	47	3	4	1	629	5	11	11	857
Five Mile	16	31	4	4	0	139	14	47	7	6	19	6	76	12	10	9	400
Frankton	150	126	23	26	136	0	90	198	40	59	74	22	496	113	45	64	1661
Frankton Rd	28	29	17	22	23	167	0	32	40	9	14	5	460	17	14	11	888
Glenda Dr	8	25	3	3	25	99	9	0	4	5	16	4	44	10	15	12	282
Gorge Road	4	11	16	18	5	30	13	6	0	2	3	1	266	3	6	5	390
Kelvin Heights	44	27	7	6	21	217	20	36	11	0	10	4	139	43	13	8	607
LHE/Shotover Country	54	221	27	10	79	330	35	148	20	12	0	22	223	19	16	15	1232
Quail Rise	9	19	3	2	14	56	6	21	3	2	12	0	37	5	3	2	193
Town Centre	64	140	177	207	56	406	148	69	217	34	32	10	0	45	132	109	1847
Jacks Point	66	34	8	9	34	334	30	54	16	34	15	6	193	0	0	17	852
East External	30	139	22	13	42	232	22	34	13	15	20	5	200	0	0	0	786
South External	12	17	2	6	6	53	7	9	9	6	5	1	88	15	76	0	313
Total	540	896	413	371	521	2475	470	784	512	212	330	102	3610	321	506	308	12370

BUS PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
port	-	2%	2%	6%	2%	8%	8%	2%	3%	3%	7%	3%	31%	12%	-	-	12%
owtown	1%	-	3%	2%	1%	1%	2%	1%	2%	1%	1%	1%	8%	2%	-	-	3%
hurs Point	1%	3%	-	3%	1%	2%	3%	2%	5%	1%	1%	2%	21%	1%	-	-	14%
nhill	7%	3%	4%	-	3%	8%	9%	2%	5%	3%	3%	2%	39%	5%	-	-	30%
Five Mile	1%	1%	0%	1%	-	1%	1%	1%	2%	2%	1%	1%	5%	1%	-	-	2%
Frankton	4%	1%	1%	4%	1%	-	5%	1%	2%	4%	4%	2%	20%	4%	-	-	8%
Frankton Rd	10%	6%	7%	8%	4%	10%	-	3%	9%	4%	4%	9%	35%	7%	-	-	22%
Glenda Dr	1%	1%	1%	1%	1%	1%	1%	-	1%	1%	1%	1%	6%	1%	-	-	1%
Gorge Road	2%	3%	6%	3%	5%	3%	5%	4%	-	2%	2%	3%	27%	3%	-	-	19%
Kelvin Heights	6%	1%	1%	2%	5%	6%	3%	5%	2%	-	2%	2%	13%	4%	-	-	7%
LHE/Shotover Country	5%	2%	1%	2%	3%	5%	3%	4%	2%	2%	-	2%	14%	4%	-	-	6%
Quail Rise	1%	1%	1%	0%	1%	1%	1%	1%	1%	1%	0%	-	6%	1%	-	-	2%
Town Centre	15%	10%	15%	17%	6%	16%	16%	12%	18%	6%	6%	11%	-	10%	-	-	12%
Jacks Point	4%	1%	1%	1%	2%	3%	2%	2%	1%	1%	2%	1%	6%	-	-	-	3%
East External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
South External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
Total	5%	3%	8%	11%	2%	6%	8%	3%	10%	3%	3%	3%	21%	5%	0%	0%	10%

0	0	0	0	0	0	0	0	0	0	Airport	0%	0%	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	Arrowtown	0%	-	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	Arthurs Point	0%	0%	-	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	Fernhill	0%	0%	0%	-	0%	0%	
0	0	0	0	0	0	0	0	0	0	Five Mile	0%	0%	0%	0%	-	0%	
0	0	0	0	0	0	0	0	0	0	Frankton	0%	0%	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	Frankton Rd	0%	0%	0%	0%	0%	-	
0	0	0	0	0	0	0	0	0	0	Glenda Dr	0%	0%	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	Gorge Road	0%	0%	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	Kelvin Heights	0%	0%	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	LHE/Shotover Country	0%	0%	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	Quail Rise	0%	0%	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	Town Centre	0%	0%	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	Jacks Point	0%	0%	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	East External	0%	0%	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	South External	0%	0%	0%	0%	0%	0%	
0	0	0	0	0	0	0	0	0	0	Total	0%	0%	0%	0%	0%	0%	
P&R-MRT PASSENGERS (SHARE)											Airport	0%	0%	0%	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	Arrowtown	0%	-	0%	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	Arthurs Point	0%	0%	-	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	Fernhill	0%	0%	0%	-	0%	0%
0	0	0	0	0	0	0	0	0	0	0	Five Mile	0%	0%	0%	0%	-	0%
0	0	0	0	0	0	0	0	0	0	0	Frankton	0%	0%	0%	0%	-	0%
0	0	0	0	0	0	0	0	0	0	0	Frankton Rd	0%	0%	0%	0%	0%	-
0	0	0	0	0	0	0	0	0	0	0	Glenda Dr	0%	0%	0%	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	Gorge Road	0%	0%	0%	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	Kelvin Heights	0%	0%	0%	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	LHE/Shotover Country	0%	0%	0%	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	Quail Rise	0%	0%	0%	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	Town Centre	0%	0%	0%	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	Jacks Point	0%	0%	0%	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	East External	0%	0%	0%	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	South External	0%	0%	0%	0%	0%	0%
0	0	0	0	0	0	0	0	0	0	0	Total	0%	0%	0%	0%	0%	0%
CAR PASSENGERS (SHARE)											Airport	98%	98%	94%	98%	92%	92%
9	3	6	5	1	53	8	41	15	241	9	99%	-	97%	98%	99%	98%	
102	43	15	93	14	328	21	105	27	1219	102	99%	97%	-	97%	99%	98%	
8	36	4	6	1	257	3	17	4	457	8	99%	97%	96%	97%	98%	97%	
10	45	3	4	1	381	5	11	11	597	10	93%	97%	96%	-	97%	92%	
47	6	6	18	6	72	12	10	9	393	47	99%	99%	100%	99%	-	99%	
195	39	56	70	21	395	109	45	64	1530	195	96%	99%	99%	96%	99%	-	
31	37	8	13	4	285	16	14	11	680	31	90%	94%	93%	91%	96%	89%	
0	4	5	16	4	41	10	15	12	277	0	99%	99%	99%	99%	99%	99%	
6	0	2	3	1	196	3	6	5	315	6	98%	97%	94%	97%	94%	97%	
34	10	0	10	4	112	41	13	8	556	34	94%	99%	99%	97%	95%	94%	
142	19	12	0	21	192	19	16	14	1164	142	95%	98%	99%	98%	97%	95%	
21	3	2	12	0	35	5	3	2	190	21	99%	99%	99%	100%	99%	99%	
60	179	31	30	9	0	41	132	109	1610	60	85%	90%	85%	83%	93%	84%	
53	16	34	15	6	181	0	0	17	823	53	96%	99%	99%	99%	98%	97%	
34	13	15	20	5	200	0	0	0	786	34	100%	100%	100%	100%	100%	100%	
9	9	6	5	1	88	15	76		313	9	100%	100%	100%	100%	100%	100%	
761	463	204	322	99	2816	306	506	308	11150	761	95%	97%	92%	89%	98%	94%	

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	28	7	10	17	156	22	19	6	23	19	4	116	32	59	9	529
Arrowtown	28	0	50	16	57	225	23	79	32	10	81	12	245	15	116	17	1006
Arthurs Point	8	45	0	16	6	33	13	7	29	2	9	1	218	3	20	3	413
Fernhill	8	14	14	0	7	43	19	6	31	3	5	1	437	5	16	12	622
Five Mile	17	57	6	7	0	252	22	66	8	12	42	9	105	19	25	7	656
Frankton	159	225	32	51	245	0	152	254	51	127	172	35	718	185	109	70	2584
Frankton Rd	20	27	15	25	21	130	0	22	28	10	15	4	316	16	24	13	685
Glenda Dr	20	71	6	6	66	262	23	0	7	17	61	12	89	27	28	9	705
Gorge Road	6	20	18	30	7	43	24	6	0	4	7	1	336	7	11	5	524
Kelvin Heights	24	12	3	4	13	118	11	17	6	0	4	2	75	18	13	14	332
LHE/Shotover Country	20	84	10	5	44	161	15	70	9	4	0	9	107	7	34	6	584
Quail Rise	4	12	1	1	10	36	4	13	2	1	8	0	21	3	6	2	123
Town Centre	123	265	229	484	115	748	333	101	353	71	116	24	0	108	180	88	3337
Jacks Point	34	16	3	6	20	186	17	28	9	18	7	3	107	0	0	25	478
East External	58	109	18	13	25	108	22	30	10	9	30	5	130	0	0	14	582
South External	8	17	2	10	6	57	12	8	8	11	6	1	68	20	13	0	248
Total	535	1003	415	684	659	2557	712	727	585	324	583	123	3089	464	654	294	13407

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	3	0	0	0	0	0	0	11	0	0	0	16
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	4
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	21
Fernhill	0	0	0	0	0	1	0	0	0	0	0	0	75	0	0	0	76
Five Mile	0	1	0	0	0	6	0	1	0	0	1	0	7	0	0	0	17
Frankton	1	1	0	0	3	0	1	3	0	1	2	0	37	1	0	0	51
Frankton Rd	0	0	0	0	0	2	0	0	1	0	0	0	51	0	0	0	56
Glenda Dr	0	1	0	0	1	5	0	0	0	0	1	0	9	0	0	0	17
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	45	0	0	0	47
Kelvin Heights	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	3
LHE/Shotover Country	0	0	0	0	1	3	0	2	0	0	0	0	13	0	0	0	20
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	14	8	31	87	6	85	55	14	65	3	16	1	0	3	0	0	387
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	17	12	32	89	12	106	59	20	67	5	21	1	272	5	0	0	717

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	5
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	4
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	4	4	0	0	1	0	0	2	0	0	0	11
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	4	4	0	0	2	0	0	12	0	0	0	23

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	28	7	10	17	156	22	19	6	23	19	4	116	32	59	9	529
Arrowtown	28	0	50	16	57	225	23	79	32	10	81	12	245	15	116	17	1006
Arthurs Point	8	45	0	16	6	33	13	7	29	2	9	1	218	3	20	3	413
Fernhill	8	14	14	0	7	43	19	6	31	3	5	1	437	5	16	12	622
Five Mile	17	57	6	7	0	252	22	66	8	12	42	9	105	19	25	7	656
Frankton	159	225	32	51	245	0	152	254	51	127	172	35	718	185	109	70	2584
Frankton Rd	20	27	15	25	21	130	0	22	28	10	15	4	316	16	24	13	685
Glenda Dr	20	71	6	6	66	262	23	0	7	17	61	12	89	27	28	9	705
Gorge Road	6	20	18	30	7	43	24	6	0	4	7	1	336	7	11	5	524
Kelvin Heights	24	12	3	4	13	118	11	17	6	0	4	2	75	18	13	14	332
LHE/Shotover Country	20	84	10	5	44	161	15	70	9	4	0	9	107	7	34	6	584
Quail Rise	4	12	1	1	10	36	4	13	2	1	8	0	21	3	6	2	123
Town Centre	123	265	229	484	115	748	333	101	353	71	116	24	0	108	180	88	3337
Jacks Point	34	16	3	6	20	186	17	28	9	18	7	3	107	0	0	25	478
East External	58	109	18	13	25	108	22	30	10	9	30	5	130	0	0	14	582
South External	8	17	2	10	6	57	12	8	8	11	6	1	68	20	13	0	248
Total	535	1003	415	684	659	2557	712	727	585	324	583	123	3089	464	654	294	13407

BUS PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	-	0%	0%	1%	0%	2%	2%	0%	0%	1%	2%	0%	9%	1%	-	-	3%
Arrowtown	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	-	-	0%
Arthurs Point	0%	1%	-	1%	0%	1%	1%	1%	2%	0%	0%	0%	9%	0%	-	-	5%
Fernhill	1%	0%	0%	-	1%	1%	2%	0%	1%	0%	2%	0%	17%	0%	-	-	12%
Five Mile	1%	1%	0%	1%	-	2%	1%	2%	1%	2%	1%	2%	7%	1%	-	-	3%
Frankton	1%	0%	0%	1%	1%	-	1%	1%	1%	1%	1%	0%	5%	1%	-	-	2%
Frankton Rd	2%	1%	1%	2%	1%	2%	-	1%	2%	1%	3%	1%	16%	1%	-	-	8%
Glenda Dr	1%	1%	1%	1%	1%	2%	2%	1%	-	2%	2%	0%	10%	1%	-	-	2%
Gorge Road	0%	0%	2%	1%	1%	1%	2%	1%	-	0%	1%	0%	14%	0%	-	-	9%
Kelvin Heights	1%	0%	0%	0%	0%	1%	1%	0%	1%	0%	-	0%	2%	0%	-	-	1%
LHE/Shotover Country	2%	1%	0%	1%	3%	2%	3%	2%	2%	1%	-	0%	12%	1%	-	-	3%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	1%	0%	-	-	0

[illegible]

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	34	3	4	17	167	24	9	3	44	50	8	32	67	16	16	493
Arrowtown	17	0	47	19	50	212	31	43	19	22	202	17	180	28	142	22	1052
Arthurs Point	4	65	0	23	6	31	21	4	21	5	24	2	186	6	19	3	422
Fernhill	7	22	20	0	7	56	30	3	31	6	11	2	371	10	16	12	603
Five Mile	12	73	6	7	0	288	28	42	6	23	90	15	68	35	61	10	764
Frankton	111	294	31	63	280	0	197	167	44	222	357	57	543	339	341	86	3130
Frankton Rd	14	31	15	25	22	150	0	15	23	20	34	6	249	32	21	16	672
Glenda Dr	12	96	6	6	59	246	29	0	4	31	134	20	50	49	43	13	797
Gorge Road	4	54	38	52	8	59	47	4	0	12	23	3	295	19	16	11	644
Kelvin Heights	13	12	2	4	11	109	13	10	4	0	11	2	49	34	8	14	295
LHE/Shotover Country	13	109	10	5	38	159	18	40	6	9	0	11	68	13	38	8	545
Quail Rise	3	16	1	1	9	36	5	7	1	4	19	0	14	6	7	2	132
Town Centre	73	360	270	689	92	687	498	39	340	136	234	37	0	196	165	103	3918
Jacks Point	19	21	3	6	19	187	23	17	6	42	17	5	70	0	0	28	462
East External	46	111	20	18	50	316	30	23	11	18	37	6	172	0	0	0	859
South External	15	22	3	14	8	72	16	8	12	14	11	2	105	29	85	0	415
Total	363	1321	475	937	677	2775	1009	430	531	608	1253	193	2451	862	977	342	15204

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	10	1	0	0	1	4	0	2	7	0	0	26
Arrowtown	0	0	1	0	0	3	1	0	0	0	3	0	5	0	0	0	15
Arthurs Point	0	1	0	0	0	1	1	0	1	0	0	0	8	0	0	0	13
Fernhill	0	0	0	0	0	5	2	0	1	0	0	0	35	0	0	0	46
Five Mile	0	0	0	0	0	2	0	0	0	0	1	0	1	0	0	0	7
Frankton	3	2	0	2	1	0	9	1	1	9	16	0	31	9	0	0	85
Frankton Rd	1	1	1	2	0	15	0	0	2	1	2	0	34	2	0	0	62
Glenda Dr	0	1	0	0	0	2	0	0	0	0	2	0	1	0	0	0	7
Gorge Road	0	1	1	1	0	2	2	0	0	0	0	0	16	0	0	0	24
Kelvin Heights	0	0	0	0	0	3	0	0	0	0	0	0	2	1	0	0	7
LHE/Shotover Country	0	1	0	0	0	7	0	0	0	0	0	0	3	0	0	0	12
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Town Centre	31	52	98	282	10	330	178	8	143	33	70	9	0	56	0	0	1300
Jacks Point	1	0	0	0	0	4	1	0	0	0	0	0	3	0	0	0	9
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	37	61	102	288	14	384	195	10	149	46	99	10	141	78	0	0	1614

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
Frankton Rd	0	0	0	0	0	1	0	0	0	1	0	0	2	0	0	0	4
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	1	0	0	0	2	10	17	0	0	15	0	0	3	0	0	0	48
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	2	12	18	0	0	16	0	0	6	0	0	0	55

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	34	3	4	17	167	24	9	3	44	50	8	32	67	16	16	493
Arrowtown	17	0	47	19	50	212	31	43	19	22	202	17	180	28	142	22	1052
Arthurs Point	4	65	0	23	6	31	21	4	21	5	24	2	186	6	19	3	422
Fernhill	7	22	20	0	7	56	30	3	31	6	11	2	371	10	16	12	603
Five Mile	12	73	6	7	0	288	28	42	6	23	90	15	68	35	61	10	764
Frankton	111	294	31	63	280	0	197	167	44	222	357	57	543	339	341	86	3130
Frankton Rd	14	31	15	25	22	150	0	15	23	20	34	6	249	32	21	16	672
Glenda Dr	12	96	6	6	59	246	29	0	4	31	134	20	50	49	43	13	797
Gorge Road	4	54	38	52	8	59	47	4	0	12	23	3	295	19	16	11	644
Kelvin Heights	13	12	2	4	11	109	13	10	4	0	11	2	49	34	8	14	295
LHE/Shotover Country	13	109	10	5	38	159	18	40	6	9	0	11	68	13	38	8	545
Quail Rise	3	16	1	1	9	36	5	7	1	4	19	0	14	6	7	2	132
Town Centre	73	360	270	689	92	687	498	39	340	136	234	37	0	196	165	103	3918
Jacks Point	19	21	3	6	19	187	23	17	6	42	17	5	70	0	0	28	462
East External	46	111	20	18	50	316	30	23	11	18	37	6	172	0	0	0	859
South External	15	22	3	14	8	72	16	8	12	14	11	2	105	29	85	0	415
Total	363	1321	475	937	677	2775	1009	430	531	608	1253	193	2451	862	977	342	15204

BUS PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	-	1%	1%	4%	1%	6%	5%	1%	3%	2%	7%	1%	8%	10%	-	-	5%
Arrowtown	1%	-	2%	1%	0%	1%	2%	1%	2%	1%	1%	1%	3%	1%	-	-	1%
Arthurs Point	1%	2%	-	2%	1%	2%	3%	1%	4%	1%	2%	1%	4%	2%	-	-	3%
Fernhill	6%	1%	2%	-	1%	9%	7%	1%	3%	3%	4%	1%	10%	5%	-	-	8%
Five Mile	0%	1%	0%	1%	-	1%	1%	0%	2%	2%	1%	0%	2%	1%	-	-	1%
Frankton	2%	1%	1%	3%	0%	-	5%	0%	2%	4%	5%	0%	6%	3%	-	-	3%
Frankton Rd	8%	5%	5%	8%	1%	10%	-	1%	10%	5%	6%	5%	13%	7%	-	-	9%
Glenda Dr	1%	1%	1%	1%	0%	1%	1%	-	2%	2%	2%	0%	2%	1%	-	-	1%
Gorge Road	2%	1%	4%	2%	4%	3%	3%	1%	-	2%	2%	2%	5%	2%	-	-	4%
Kelvin Heights	2%	1%	1%	2%	1%	3%	2%	1%	2%	-	2%	0%	3%	2%	-	-	2%
LHE/Shotover Country	3%	1%	1%	2%	1%	4%	2%	1%	2%	1%	-	0%	4%	2%	-	-	2%
Quail Rise	1%	1%	1%	1%	0%	1%	2%	0%	2%	1%	1%	-	3%	1%	-	-	1%
Town Centre	42%	14%	36%	41%	11%	48%	36%	21%	42%	24%	30%	24%	-	29%	-	-	33%
Jacks Point	3%	0%	1%	2%	1%	2%	2%	0%	1%	1%	3%	0%	4%	-	-	-	2%
East External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
South External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
Total	10%	5%	21%	31%	2%	14%	19%	2%	28%	8%	8%	5%	6%	9%	0%	0%	11%

[illegible]

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	14	5	5	14	20	9	9	4	7	5	1	77	9	41	15	29	8	236
Arrowtown	39	0	77	19	97	99	30	104	44	15	85	14	357	21	105	27	77	40	1133
Arthurs Point	5	49	0	18	11	11	14	8	38	4	6	1	324	3	17	4	12	3	513
Fernhill	9	14	23	0	16	23	21	10	47	3	3	1	629	5	11	11	24	6	826
Five Mile	22	44	7	6	0	64	20	62	9	9	23	7	107	17	18	13	65	29	427
Frankton	39	38	7	9	56	0	33	45	14	18	23	7	171	34	16	27	92	37	539
Frankton Rd	28	29	17	22	40	78	0	33	40	9	13	5	460	17	14	11	51	20	816
Glenda Dr	10	28	3	3	45	32	10	0	4	5	16	5	50	11	15	12	42	17	249
Gorge Road	4	11	16	18	9	12	13	6	0	2	2	1	266	3	6	5	11	3	376
Kelvin Heights	44	27	7	6	34	95	20	36	11	0	9	4	139	43	13	8	71	38	497
LHE/Shotover Country	52	209	25	10	113	139	34	143	19	11	0	21	214	18	15	14	82	57	1035
Quail Rise	9	19	3	2	20	24	6	21	3	2	11	0	37	5	3	2	15	11	167
Town Centre	64	140	177	207	118	137	148	70	217	34	29	10	0	45	132	109	170	36	1638
Jacks Point	66	34	8	9	53	146	30	55	16	34	14	6	193	0	0	17	110	59	681
East External	30	139	22	13	105	35	22	34	12	15	18	5	200	0	0	15	122	12	665
South External	12	17	2	6	9	23	7	9	9	6	4	1	88	15	6	0	19	8	216
Remarkables Park	73	48	9	11	97	151	36	87	17	27	24	8	211	52	17	24	0	96	891
Frankton South East	31	24	4		42	65	14	49		7	10		77	21	4		0	0	377
Total	434	811	399	356	739	937	419	645	488	174	262	89	3312	247	413	290	991	385	10015

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	1	1	1	0	0	0	0	0	36	0	0	0	1	0	41
Arrowtown	1	0	2	1	4	4	2	4	1	1	5	0	47	1	0	0	4	1	73
Arthurs Point	0	1	0	2	1	1	1	1	3	0	0	0	154	0	0	0	1	0	166
Fernhill	1	1	2	0	2	3	2	1	6	0	0	0	306	0	0	0	3	1	323
Five Mile	1	1	0	0	0	3	1	2	1	1	1	0	36	1	0	0	5	1	47
Frankton	3	2	1	1	4	0	3	3	1	2	2	0	77	3	0	0	6	2	101
Frankton Rd	3	2	1	2	3	7	0	3	3	1	1	0	171	2	0	0	5	2	198
Glenda Dr	0	1	0	0	1	1	0	0	0	0	0	0	16	0	0	0	2	1	21
Gorge Road	0	1	1	1	1	1	1	1	0	0	0	0	122	0	0	0	1	0	130
Kelvin Heights	3	1	0	1	4	7	2	4	1	0	0	0	58	2	0	0	11	5	85
LHE/Shotover Country	1	5	1	1	6	2	4	1	1	0	0	0	48	0	0	0	3	1	72
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	5
Town Centre	11	11	24	32	15	19	19	9	31	5	3	0	0	5	0	0	27	5	184
Jacks Point	4	1	0	1	3	11	3	3	1	2	0	0	41	0	0	0	6	3	69
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	1	0	0	0	1	2	0	1	0	1	0	0	20	0	0	0	0	2	28
Frankton South East	1	0	0	0	2	2	0	2	0	1	0	0	21	0	0	0	4	0	30
Total	30	27	34	41	42	64	37	35	49	14	14	1	1113	14	0	0	77	22	1516

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	7
Frankton Rd	0	0	0	0	0	1	0	0	0	0	0	0	24	0	0	0	0	0	25
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	1	0	0	0	0	0	0	10	0	0	0	0	0	12
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	1	2	0	0	1	0	0	4	0	0	0	0	0	9
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	3	3	0	0	2	0	0	46	0	0	0	0	0	55

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
Arrowtown	1	0	0	0	0	0	0	0	1	0	0	0	78	0	0	0	0	0	90
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	1	0	0	0	2	2	0	2	1	0	0	0	55	0	0	0	3	1	61
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	3
Jacks Point	3	0	0	0	3	2	0	3	1	0	0	0	70	0	0	0	7	3	81
East External	1	0	0	0	5	1	0	1	1	0	0	0	71	0	0	0	11	1	80
South External	0	0	0	0	0	1	0	0	1	0	0	0	38	0	0	2	0	0	42
Remarkables Park	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
Total	6	0	0	0	13	8	0	9	4	0	3	0	312	2	0	5	27	6	363

MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2028 NZUP AM

Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

P&R-MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CAR PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	14	5	5	14	19	8	9	3	6	5	1	41	8	41	14	27	8	194
Arrowtown	36	0	75	19	90	92	28	97	41	14	79	14	231	21	105	27	68	37	970
Arthurs Point	5	48	0	17	10	10	13	7	34	3	5	1	169	3	17	4	11	3	347
Fernhill	8	14	21	0	15	20	19	9	41	3	3	1	323	5	11	11	21	5	503
Five Mile	21	43	6	6	0	61	19	60	8	8	22	7	71	16	18	12	60	28	378
Frankton	36	36	7	8	51	0	30	42	13	16	21	6	88	32	16	27	86	35	430
Frankton Rd	25	27	16	20	37	71	0	30	37	8	12	5	266	15	14	11	46	19	593
Glenda Dr	9	27	3	3	43	30	10	0	4	5	16	5	35	10	15	12	40	16	227
Gorge Road	4	11	15	17	8	11	12	5	0	2	2	1	145	3	6	5	10	3	246
Kelvin Heights	41	26	6	6	30	87	18	31	10	0	9	3	71	41	13	8	60	33	401
LHE/Shotover Country	50	203	24	9	107	132	32	137	18	11	0	21	112	18	15	14	75	55	902
Quail Rise	9	19	3	2	20	23	6	21	3	2	11	0	33	5	3	2	14	10	162
Town Centre	53	129	153	176	103	117	127	61	187	28	24	10	0	40	132	108	142	32	1447
Jacks Point	59	34	7	9	47	133	28	49	14	32	13	6	82	0	17	97	53	53	530
East External	29	139	22	13	101	34	22	33	12	15	18	5	129	0	0	15	110	11	585
South External	12	17	2	6	9	22	7	9	9	6	4	1	50	15	6	0	18	8	176
Remarkables Park	73	48	9	10	95	149	36	85	16	26	23	8	190	51	17	24	0	94	861
Frankton South East	30	24	4	4	41	63	13	47	6	9	13	5	56	19	4	8	79	0	345
Total	398	785	365	315	684	862	379	601	434	158	245	87	1846	231	413	287	886	356	8089

Frankton	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

P&R-MRT PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arrowtown	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fernhill	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Five Mile	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

CAR PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	
Airport	-	97%	95%	92%	96%	94%	92%	96%	94%	94%	96%	99%	54%	89%	100%	93%	95%	96%	82%
Arrowtown	94%	-	97%	97%	92%	93%	94%	93%	94%	93%	94%	99%	65%	98%	100%	100%	88%	93%	86%
Arthurs Point	93%	97%	-	92%	92%	92%	91%	92%	91%	92%	91%	98%	52%	96%	100%	100%	90%	92%	68%
Fernhill	86%	96%	91%	-	90%	88%	89%	90%	88%	86%	91%	98%	51%	94%	100%	100%	87%	89%	61%
Five Mile	97%	97%	91%	92%	-	95%	94%	98%	94%	90%	95%	99%	65%	94%	100%	99%	93%	95%	88%
Frankton	92%	95%	91%	88%	92%	-	91%	93%	90%	90%	92%	98%	52%	91%	100%	99%	93%	94%	80%
Frankton Rd	90%	94%	92%	90%	92%	90%	-	92%	92%	87%	93%	98%	58%	91%	100%	100%	91%	92%	73%
Glenda Dr	98%	98%	96%	94%	97%	96%	95%	-	95%	92%	96%	99%	69%	93%	100%	96%	95%	97%	91%
Gorge Road	91%	95%	91%	92%	91%	91%	91%	91%	-	87%	89%	98%	54%	94%	100%	99%	89%	90%	65%
Kelvin Heights	93%	95%	94%	91%	87%	92%	88%	87%	92%	-	96%	95%	51%	95%	100%	100%	85%	87%	81%
LHE/Shotover Country	96%	97%	96%	94%	95%	95%	95%	96%	93%	95%	-	100%	52%	97%	100%	99%	92%	96%	87%
Quail Rise	99%	100%	99%	99%	98%	99%	98%	99%	99%	96%	100%	-	89%	99%	100%	95%	97%	98%	97%
Town Centre	83%	92%	87%	85%	87%	85%	86%	87%	86%	81%	82%	97%	-	89%	100%	99%	84%	87%	88%
Jacks Point	89%	98%	93%	90%	91%	91%	90%	87%	95%	98%	98%	42%	42%	-	0%	100%	88%	90%	78%
East External	96%	100%	100%	100%	96%	97%	100%	96%	94%	100%	100%	99%	65%	0%	-	100%	91%	95%	88%
South External	96%	100%	100%	100%	97%	97%	100%	97%	93%	100%	100%	100%	57%	100%	100%	-	95%	96%	81%
Remarkables Park	99%	99%	99%	98%	99%	99%	99%	98%	98%	97%	96%	99%	90%	99%	100%	99%	-	98%	97%
Frankton South East	98%	98%	96%	95%	96%	97%	96%	97%	96%	93%	96%	99%	72%	92%	100%	94%	95%	-	91%
Total	92%	97%	92%	88%	93%	92%	90%	93%	89%	91%	93%	99%	56%	93%	100%	99%	89%	92%	81%

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	28	7	10	32	45	22	20	6	23	18	4	116	32	59	9	73	22	432
Arrowtown	28	0	50	16	107	66	23	80	32	10	72	12	245	15	116	17	85	24	887
Arthurs Point	8	45	0	16	13	9	13	7	29	2	9	1	218	3	20	3	14	3	396
Fernhill	8	14	14	0	13	14	19	7	31	3	5	1	437	5	16	12	18	4	600
Five Mile	32	106	13	15	0	109	44	113	15	24	65	16	217	34	47	12	216	47	860
Frankton	46	67	9	17	107	0	57	65	17	46	61	12	217	68	32	26	168	48	847
Frankton Rd	20	27	15	25	40	48	0	23	28	10	14	4	316	16	24	13	50	13	622
Glenda Dr	20	71	7	8	114	67	24	0	7	17	57	13	96	27	29	9	111	39	566
Gorge Road	6	20	18	30	14	14	24	7	0	4	7	1	336	7	11	5	18	4	502
Kelvin Heights	24	12	3	4	24	43	11	17	6	0	3	2	75	18	13	14	50	14	267
LHE/Shotover Country	19	74	9	5	68	55	14	65	8	3	0	8	99	6	31	5	46	19	469
Quail Rise	4	12	1	1	17	12	4	13	2	1	8	0	21	3	6	2	12	5	106
Town Centre	123	265	229	484	240	231	333	107	353	71	107	24	0	108	180	88	317	69	2942
Jacks Point	34	16	3	6	35	70	17	28	9	18	6	3	107	0	0	25	76	24	378
East External	58	109	18	13	48	31	22	31	10	27	27	5	130	0	0	14	43	12	524
South External	8	17	2	10	11	21	12	8	8	11	11	1	68	13	0	0	23	9	216
Remarkables Park	75	84	13	21	203	172	58	107	21	55	48	12	314	77	42	27	0	95	1330
Frankton South East	22	25	3	4	47	49	15	39	5	14	22	5	70	24	0	0	0	0	366
Total	436	885	398	658	883	834	637	589	558	253	464	106	2698	363	597	254	1318	354	10613

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	1	0	1	1	4	2	0	0	2	0	0	44	1	0	0	3	0	57
Arrowtown	1	0	1	0	2	3	1	1	1	1	2	0	22	0	0	0	5	0	35
Arthurs Point	1	1	0	1	0	1	1	0	2	0	0	0	70	0	0	0	1	0	79
Fernhill	1	0	1	0	1	2	0	3	0	0	0	0	140	0	0	0	2	0	150
Five Mile	2	2	1	1	0	6	2	4	1	3	2	0	47	2	0	0	18	3	73
Frankton	4	3	1	2	5	0	5	3	2	4	3	0	74	5	0	0	14	2	112
Frankton Rd	2	1	1	2	2	4	0	1	2	1	1	0	84	1	0	0	5	1	102
Glenda Dr	0	1	0	0	4	4	1	0	0	2	2	0	22	1	0	0	5	1	38
Gorge Road	1	1	2	3	1	1	2	0	0	1	0	0	109	0	0	0	3	0	119
Kelvin Heights	1	1	0	0	2	3	1	1	0	0	0	0	21	1	0	0	7	1	31
LHE/Shotover Country	0	2	0	0	2	3	1	2	0	0	0	0	17	0	0	0	7	0	28
Quail Rise	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	1	0	2
Town Centre	51	25	72	160	38	71	90	17	112	23	14	1	0	15	0	0	124	16	689
Jacks Point	2	0	0	0	1	4	1	1	0	1	0	0	15	0	0	0	3	1	25
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	4	4	1	3	12	13	5	5	2	8	1	0	109	4	0	0	0	6	171
Frankton South East	1	0	0	0	2	2	1	1	0	1	0	0	16	1	0	0	6	0	27
Total	66	39	79	171	57	106	109	30	125	37	25	2	666	27	0	0	195	26	1539

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	7
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	13
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	5
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	2	6	11	0	0	5	0	0	5	0	0	0	0	0	29
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	2	7	12	0	0	6	0	0	28	0	0	0	0	0	56

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4
Arrowtown	1	0	0	0	0	2	0	1	1	0	0	0	40	0	0	0	13	0	49
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	4	0	0	0	0	0	0	0	0	1	0	0	2	1	0	0	0	12
Frankton	0	2	0	0	0	0	0	0	0	0	1	0	0	3	1	1	0	0	8
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	3	0	0	0	0	0	0	0	0	1	0	0	2	1	0	0	0	7
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	1	1	0	1	0	0	0	0	19	0	0	0	3	0	22
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	43	0	0	0	0	0	0	0	25	0	0	0	42	44	37	0	0	191
Jacks Point	1	0	0	0	2	2	1	1	1	0	0	0	29	0	0	0	4	1	36
East External	2	0	0	0	2	1	1	1	1	0	0	0	38	0	0	0	5	0	46
South External	0	0	0	0	0	0	0	0	1	0	0	0	20	0	0	2	0	0	24
Remarkables Park	0	6	0	0	0	0	0	0	0	0	2	0	0	7	3	2	0	0	19
Frankton South East	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	3
Total	4	53	0	1	8	6	1	5	4	0	29	0	145	53	50	42	25	3	401

MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

P&R-MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CAR PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	27	7	9	32	41	20	19	5	22	17	4	72	30	58	9	70	21	372
Arrowtown	27	0	48	15	101	61	22	76	29	10	69	12	183	15	116	17	67	23	803
Arthurs Point	7	44	0	15	13	9	12	7	26	2	8	1	147	3	20	3	12	2	317
Fernhill	7	14	13	0	13	13	18	7	28	3	5	1	297	5	16	12	15	4	449
Five Mile	31	99	12	14	0	102	41	109	14	21	62	16	169	28	45	11	198	44	773
Frankton	41	62	8	15	102	0	51	62	15	41	58	12	137	60	31	25	154	46	720
Frankton Rd	17	26	14	23	39	44	0	22	26	8	13	4	220	15	24	13	45	12	508
Glenda Dr	20	68	6	7	111	63	23	0	7	15	55	13	74	24	28	9	106	38	521
Gorge Road	5	18	17	27	13	12	22	6	0	4	6	1	227	6	10	5	16	4	380
Kelvin Heights	23	12	3	3	22	40	10	16	5	0	3	1	50	17	13	14	43	12	231
LHE/Shotover Country	18	72	9	4	65	51	13	63	8	3	0	8	63	6	31	5	41	18	419
Quail Rise	4	12	1	1	16	12	4	13	2	1	8	0	19	3	6	2	11	5	103
Town Centre	71	157	324	200	154	232	90	241	43	68	22	0	51	136	51	193	54	2038	316
Jacks Point	31	16	3	5	33	64	16	26	8	18	6	3	63	0	0	25	69	22	316
East External	56	109	18	12	46	29	21	30	9	9	27	5	93	0	0	14	38	11	478
South External	8	17	2	10	10	21	12	8	7	11	5	1	49	20	13	0	21	9	195
Remarkables Park	71	74	12	18	191	159	53	102	19	48	45	11	205	67	39	25	0	88	1141
Frankton South East	22	23	3	4	45	47	14	38	5	13	21	5	53	22	11	12	91	0	336
Total	365	793	319	486	817	716	515	554	428	211	410	104	1863	283	547	214	1097	325	8624

Frankton	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

P&R-MRT PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arrowtown	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fernhill	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Five Mile	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

CAR PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	
Airport	-	95%	95%	91%	98%	91%	90%	98%	94%	93%	97%	99%	62%	92%	97%	97%	95%	98%	86%
Arrowtown	95%	-	98%	97%	95%	93%	95%	96%	93%	94%	97%	100%	75%	98%	100%	100%	79%	95%	90%
Arthurs Point	93%	98%	-	92%	96%	93%	93%	96%	92%	91%	95%	99%	68%	96%	100%	100%	89%	94%	80%
Fernhill	87%	97%	93%	-	96%	90%	91%	96%	89%	88%	95%	99%	68%	95%	100%	100%	87%	94%	75%
Five Mile	95%	94%	95%	93%	-	94%	94%	97%	94%	87%	95%	99%	78%	84%	96%	94%	91%	94%	90%
Frankton	90%	92%	90%	87%	96%	-	90%	96%	88%	95%	98%	63%	88%	97%	97%	92%	96%	85%	
Frankton Rd	89%	95%	94%	93%	96%	91%	-	96%	92%	87%	96%	99%	70%	91%	100%	100%	90%	94%	82%
Glenda Dr	98%	95%	95%	94%	97%	95%	94%	-	94%	90%	95%	99%	77%	90%	97%	95%	96%	97%	92%
Gorge Road	89%	94%	92%	91%	96%	92%	92%	96%	-	87%	91%	98%	68%	85%	95%	92%	86%	93%	76%
Kelvin Heights	94%	95%	95%	93%	93%	92%	89%	94%	93%	-	97%	96%	66%	97%	100%	100%	87%	92%	86%
LHE/Shotover Country	97%	98%	96%	94%	96%	93%	94%	96%	91%	93%	-	100%	64%	97%	100%	100%	88%	97%	89%
Quail Rise	99%	100%	99%	99%	99%	98%	98%	99%	99%	94%	100%	94%	93%	98%	100%	100%	95%	99%	98%
Town Centre	58%	74%	69%	67%	83%	67%	70%	84%	68%	61%	64%	94%	47%	76%	58%	61%	77%	69%	
Jacks Point	92%	98%	96%	90%	94%	91%	91%	94%	86%	96%	92%	99%	59%	-	0%	100%	90%	94%	84%
East External	97%	100%	100%	96%	96%	96%	96%	97%	91%	100%	100%	100%	71%	0%	-	100%	89%	96%	91%
South External	97%	100%	100%	100%	98%	98%	100%	98%	92%	100%	100%	100%	71%	100%	100%	-	96%	96%	90%
Remarkables Park	94%	88%	91%	87%	94%	93%	91%	95%	89%	86%	94%	96%	65%	87%	94%	93%	-	93%	86%
Frankton South East	98%	95%	96%	93%	96%	95%	95%	97%	95%	90%	96%	98%	77%	93%	97%	96%	94%	-	92%
Total	84%	90%	80%	74%	93%	86%	81%	94%	77%	83%	88%	98%	69%	78%	92%	84%	83%	92%	81%

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	34	3	4	25	41	24	10	3	44	48	8	32	67	16	16	86	30	374
Arrowtown	17	0	47	19	93	51	31	45	19	22	187	17	180	28	142	22	92	24	920
Arthurs Point	4	65	0	23	12	7	21	4	21	5	23	2	186	6	19	3	15	3	402
Fernhill	7	22	20	0	15	12	30	4	31	6	11	2	371	10	16	12	30	5	568
Five Mile	24	133	12	16	0	98	53	79	12	40	141	25	148	62	159	15	304	54	1018
Frankton	30	95	9	17	100	0	76	42	12	86	130	21	147	129	41	33	204	61	968
Frankton Rd	14	31	15	25	42	47	0	16	23	20	32	6	249	32	21	16	67	15	589
Glenda Dr	12	97	6	7	95	53	30	0	5	32	129	20	55	50	43	13	113	46	647
Gorge Road	4	54	38	52	15	16	47	4	0	12	22	3	295	19	16	11	29	7	607
Kelvin Heights	13	12	2	4	20	32	13	10	4	0	10	2	49	34	8	14	55	12	227
LHE/Shotover Country	12	96	9	5	63	41	17	38	6	8	0	10	63	11	34	7	59	17	420
Quail Rise	3	16	1	1	15	10	5	8	1	4	18	0	14	6	7	2	14	5	112
Town Centre	73	360	270	689	171	186	498	49	340	136	223	37	0	196	165	103	330	81	3495
Jacks Point	19	21	3	6	33	55	23	17	6	42	16	5	70	0	0	28	94	23	344
East External	46	111	20	18	140	28	30	24	11	18	34	6	172	0	0	11	189	9	668
South External	15	22	3	14	12	28	16	9	12	10	105	2	10	24	0	0	39	10	314
Remarkables Park	56	109	14	31	281	167	77	77	21	95	112	19	266	145	188	33	0	112	1691
Frankton South East	13	30	2	4	39	39	17	22	4	24	38	7	44	37	13	14	101	0	346
Total	294	1169	458	901	851	705	913	360	505	489	1033	166	2136	678	711	305	1711	404	11673

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	1	0	1	1	7	5	0	0	5	2	0	11	3	0	0	4	1	37
Arrowtown	0	0	1	1	3	3	2	1	1	2	12	0	13	1	0	0	6	1	40
Arthurs Point	0	1	0	2	1	1	2	0	2	1	4	0	31	0	0	0	2	0	45
Fernhill	1	1	2	0	1	2	3	0	3	1	1	0	60	0	0	0	4	0	75
Five Mile	2	7	1	1	0	7	4	3	1	5	15	0	16	0	0	0	23	4	65
Frankton	2	10	1	3	8	0	9	3	1	9	30	1	29	9	0	0	15	4	116
Frankton Rd	2	2	1	2	3	4	0	2	2	2	4	0	31	3	0	0	7	1	58
Glenda Dr	0	4	0	1	3	4	2	0	0	4	12	0	7	2	0	0	5	1	40
Gorge Road	0	2	3	5	2	2	4	1	0	2	4	0	49	1	0	0	4	1	74
Kelvin Heights	1	1	0	0	3	3	2	1	0	0	1	0	9	1	0	0	8	1	22
LHE/Shotover Country	0	2	0	0	2	3	1	1	0	1	0	0	7	0	0	0	4	0	19
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
Town Centre	38	40	125	323	71	81	186	21	149	56	79	5	0	30	0	0	164	35	1203
Jacks Point	1	1	0	0	2	5	2	1	0	2	1	0	8	0	0	0	5	1	23
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	1	0	1	2	2	2	1	0	4	2	0	9	1	0	0	0	1	25
Frankton South East	0	1	0	1	2	4	2	1	0	4	1	0	9	1	0	0	6	0	26
Total	48	71	135	340	101	122	221	35	160	90	165	7	271	53	0	0	252	51	1818

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Frankton	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	4
Frankton Rd	0	0	0	0	0	0	0	0	0	1	0	0	4	0	0	0	0	0	5
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	2	8	25	0	0	12	0	0	6	0	0	0	0	0	53
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	2	9	27	0	0	14	0	0	14	0	0	0	0	0	67

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4
Arrowtown	0	0	0	0	0	0	0	1	1	0	0	0	19	0	0	0	15	0	26
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	8	0	0	0	0	0	0	0	0	4	0	0	0	8	1	0	0	29
Frankton	0	4	0	0	0	0	0	0	0	0	3	0	7	2	1	0	0	0	17
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	5	0	0	0	0	0	0	0	0	3	0	0	5	2	1	0	0	16
Gorge Road	0	2	0	0	0	0	0	0	0	0	1	0	0	2	1	1	0	0	7
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	1	1	0	0	0	0	0	0	7	0	0	0	4	0	10
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	77	0	0	0	0	0	0	0	0	66	0	0	89	62	51	0	0	344
Jacks Point	1	0	0	0	2	2	1	1	1	0	0	0	14	0	0	0	5	1	20
East External	2	0	0	0	1	5	1	2	1	1	0	0	36	0	0	0	24	0	49
South External	0	0	0	0	0	1	0	0	1	0	0	0	22	0	0	4	0	0	30
Remarkables Park	0	12	0	0	0	0	0	0	0	0	6	0	0	21	20	4	0	0	62
Frankton South East	0	1	0	0	0	0	0	0	0	0	1	0	0	2	0	1	0	0	4
Total	3	96	0	1	11	7	2	3	4	0	78	0	98	114	75	60	48	2	553

MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

P&R-MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CAR PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	32	2	4	24	34	19	10	3	38	46	8	21	62	16	15	82	29	333
Arrowtown	17	0	46	18	86	46	29	42	18	21	174	17	148	27	142	22	71	23	854
Arthurs Point	4	64	0	21	11	7	19	4	20	5	19	2	155	6	19	3	13	3	357
Fernhill	6	22	18	0	14	11	27	4	28	6	9	2	311	9	16	12	26	4	493
Five Mile	22	118	11	15	0	91	49	77	11	34	123	25	131	51	151	14	281	50	923
Frankton	28	81	8	15	92	0	66	38	10	76	97	20	116	114	40	32	189	58	831
Frankton Rd	13	29	13	23	38	42	0	14	21	17	28	6	215	29	21	16	60	14	526
Glenda Dr	12	88	6	6	92	49	27	0	4	28	114	20	48	42	42	12	108	45	590
Gorge Road	3	50	35	47	13	14	43	4	0	10	17	3	245	16	15	10	24	6	525
Kelvin Heights	13	12	2	3	17	29	11	9	3	0	9	2	38	33	8	14	47	11	203
LHE/Shotover Country	11	94	8	4	60	37	16	36	5	8	0	10	49	11	34	7	51	16	390
Quail Rise	2	16	1	1	15	10	5	8	1	3	18	0	13	6	7	2	13	5	110
Town Centre	35	243	145	366	99	97	287	29	191	68	78	32	0	77	103	52	166	47	1900
Jacks Point	17	21	3	5	30	48	20	16	5	40	15	5	49	0	0	28	84	21	301
East External	45	111	20	18	134	26	28	23	10	18	34	6	137	0	0	11	165	9	620
South External	14	22	3	14	12	26	16	8	11	14	10	2	83	29	24	0	28	9	288
Remarkables Park	56	96	14	31	279	165	75	76	21	91	104	19	257	123	168	29	0	111	1604
Frankton South East	12	28	2	4	36	35	15	21	3	20	36	6	35	35	13	14	95	0	316
Total	242	1002	323	560	737	567	662	321	341	385	791	159	1759	511	637	249	1409	350	9246

Frankton	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

P&R-MRT PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arrowtown	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fernhill	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Five Mile	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

CAR PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	
Airport	-	96%	93%	82%	95%	82%	79%	97%	92%	88%	95%	99%	66%	92%	98%	97%	95%	96%	89%
Arrowtown	95%	-	98%	97%	93%	90%	93%	94%	93%	93%	93%	99%	82%	98%	100%	100%	77%	95%	93%
Arthurs Point	91%	98%	-	90%	90%	91%	92%	89%	92%	89%	83%	97%	83%	96%	100%	100%	87%	90%	89%
Fernhill	86%	97%	92%	-	90%	87%	91%	90%	89%	88%	86%	98%	84%	95%	100%	100%	86%	90%	87%
Five Mile	92%	89%	92%	93%	-	90%	93%	90%	93%	87%	89%	83%	96%	93%	92%	93%	93%	91%	91%
Frankton	92%	85%	88%	85%	92%	-	87%	92%	88%	89%	75%	98%	79%	88%	96%	96%	93%	94%	86%
Frankton Rd	89%	94%	92%	91%	92%	90%	-	90%	92%	86%	87%	98%	86%	92%	100%	100%	90%	92%	89%
Glenda Dr	98%	91%	93%	92%	97%	92%	92%	-	92%	87%	89%	99%	87%	85%	96%	94%	95%	97%	91%
Gorge Road	89%	94%	91%	90%	89%	90%	91%	88%	-	84%	77%	97%	83%	85%	93%	91%	85%	87%	87%
Kelvin Heights	94%	94%	93%	91%	85%	89%	86%	87%	91%	-	90%	93%	79%	98%	100%	100%	86%	89%	89%
LHE/Shotover Country	97%	98%	95%	92%	96%	90%	93%	96%	89%	92%	-	100%	77%	97%	100%	100%	86%	97%	93%
Quail Rise	99%	100%	99%	99%	99%	97%	98%	99%	99%	94%	99%	-	96%	98%	100%	100%	94%	99%	98%
Town Centre	48%	67%	54%	53%	58%	52%	58%	58%	56%	50%	35%	86%	-	39%	63%	50%	50%	57%	54%
Jacks Point	91%	97%	94%	88%	89%	88%	88%	91%	84%	95%	95%	86%	70%	-	0%	100%	87%	92%	88%
East External	97%	100%	100%	95%	96%	95%	94%	97%	89%	100%	100%	100%	79%	0%	-	100%	87%	96%	93%
South External	97%	100%	100%	100%	96%	96%	100%	97%	89%	100%	100%	100%	79%	100%	100%	-	95%	96%	92%
Remarkables Park	99%	89%	99%	98%	99%	99%	98%	99%	99%	96%	93%	99%	97%	85%	89%	89%	-	99%	95%
Frankton South East	98%	95%	94%	86%	94%	90%	88%	96%	94%	83%	95%	98%	80%	92%	98%	96%	94%	-	91%
Total	82%	86%	71%	62%	87%	80%	73%	89%	67%	79%	77%	96%	82%	75%	90%	82%	82%	87%	79%

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	21	7	7	12	107	10	16	4	13	8	2	97	17	59	28	407
Arrowtown	30	0	95	28	51	204	34	80	62	13	107	12	534	17	132	29	1426
Arthurs Point	5	51	0	24	5	29	24	6	50	3	7	1	448	3	22	5	683
Fernhill	7	12	20	0	5	43	28	6	48	2	3	1	695	3	12	13	898
Five Mile	23	50	8	4	0	188	16	66	6	8	28	8	78	16	15	12	526
Frankton	259	222	36	27	218	0	111	323	44	84	117	32	572	166	66	95	2370
Frankton Rd	22	28	17	25	19	131	0	26	42	7	12	4	528	13	17	12	903
Glenda Dr	13	36	5	2	33	132	8	0	3	8	22	5	32	13	20	16	348
Gorge Road	4	12	18	22	4	24	19	4	0	2	3	1	327	3	8	7	457
Kelvin Heights	102	53	10	11	44	438	42	82	19	0	21	7	256	117	18	17	1235
LHE/Shotover Country	52	345	51	15	89	329	36	157	32	9	0	25	311	15	26	23	1516
Quail Rise	8	24	4	1	15	53	6	21	2	2	15	0	29	4	4	3	189
Town Centre	67	150	194	243	50	358	182	56	249	34	33	8	0	41	176	147	1987
Jacks Point	107	52	9	11	48	479	45	87	17	60	19	7	254	0	0	30	1226
East External	41	206	34	20	54	294	23	43	25	18	33	6	291	0	0	0	1088
South External	22	19	2	6	8	78	10	12	8	13	5	1	94	27	96	0	401
Total	762	1282	507	445	654	2884	592	985	612	276	433	118	4546	456	672	436	15662

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	1	0	1	0	8	1	0	0	0	1	0	62	4	0	0	80
Arrowtown	0	0	3	0	0	6	1	1	1	0	1	0	81	0	0	0	96
Arthurs Point	0	2	0	1	0	1	1	0	3	0	0	0	176	0	0	0	183
Fernhill	0	0	1	0	0	3	2	0	2	0	0	0	423	0	0	0	432
Five Mile	0	0	0	0	0	3	0	0	0	0	0	0	14	0	0	0	18
Frankton	10	3	0	1	3	0	7	3	1	4	4	0	204	8	0	0	249
Frankton Rd	2	2	1	2	0	11	0	1	4	0	1	0	285	1	0	0	310
Glenda Dr	0	0	0	0	0	1	0	0	0	0	0	0	7	0	0	0	9
Gorge Road	0	0	1	1	0	1	1	0	0	0	0	0	153	0	0	0	157
Kelvin Heights	6	1	0	0	2	27	2	4	1	0	0	0	78	5	0	0	126
LHE/Shotover Country	4	8	2	1	1	42	3	7	2	0	0	0	152	1	0	0	222
Quail Rise	0	0	0	0	0	1	0	0	0	0	0	0	6	0	0	0	8
Town Centre	13	16	36	49	1	56	34	5	54	2	2	1	0	4	0	0	274
Jacks Point	10	0	0	0	1	23	1	2	0	1	0	0	25	0	0	0	64
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	46	34	44	56	10	181	53	24	67	8	10	3	1667	24	0	0	2228

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Frankton	0	0	0	0	0	1	0	0	0	0	0	0	14	0	0	0	16
Frankton Rd	0	0	0	0	0	1	0	0	0	0	0	0	26	0	0	0	27
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Kelvin Heights	0	0	0	0	0	2	1	0	0	1	0	0	42	0	0	0	48
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	1	0	0	0	1	7	4	1	0	4	0	0	6	0	0	0	24
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	0	1	11	6	1	1	6	0	0	92	0	0	0	120

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	21	7	7	12	107	10	16	4	13	8	2	97	17	59	28	407
Arrowtown	30	0	95	28	51	204	34	80	62	13	107	12	534	17	132	29	1426
Arthurs Point	5	51	0	24	5	29	24	6	50	3	7	1	448	3	22	5	683
Fernhill	7	12	20	0	5	43	28	6	48	2	3	1	695	3	12	13	898
Five Mile	23	50	8	4	0	188	16	66	6	8	28	8	78	16	15	12	526
Frankton	259	222	36	27	218	0	111	323	44	84	117	32	572	166	66	95	2370
Frankton Rd	22	28	17	25	19	131	0	26	42	7	12	4	528	13	17	12	903
Glenda Dr	13	36	5	2	33	132	8	0	3	8	22	5	32	13	20	16	348
Gorge Road	4	12	18	22	4	24	19	4	0	2	3	1	327	3	8	7	457
Kelvin Heights	102	53	10	11	44	438	42	82	19	0	21	7	256	117	18	17	1235
LHE/Shotover Country	52	345	51	15	89	329	36	157	32	9	0	25	311	15	26	23	1516
Quail Rise	8	24	4	1	15	53	6	21	2	2	15	0	29	4	4	3	189
Town Centre	67	150	194	243	50	358	182	56	249	34	33	8	0	41	176	147	1987
Jacks Point	107	52	9	11	48	479	45	87	17	60	19	7	254	0	0	30	1226
East External	41	206	34	20	54	294	23	43	25	18	33	6	291	0	0	0	1088
South External	22	19	2	6	8	78	10	12	8	13	5	1	94	27	96	0	401
Total	762	1282	507	445	654	2884	592	985	612	276	433	118	4546	456	672	436	15662

BUS PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
port	-	3%	3%	9%	2%	8%	11%	2%	5%	3%	7%	3%	64%	27%	-	-	20%
owtown	1%	-	3%	2%	0%	3%	3%	2%	2%	1%	1%	1%	15%	1%	-	-	7%
hurs Point	1%	3%	-	3%	2%	2%	3%	2%	5%	1%	2%	3%	39%	1%	-	-	27%
nhill	7%	3%	4%	-	1%	6%	8%	1%	5%	2%	3%	2%	61%	4%	-	-	48%
Five Mile	1%	1%	0%	0%	-	2%	2%	0%	1%	2%	0%	0%	17%	2%	-	-	3%
Frankton	4%	1%	1%	4%	2%	-	6%	1%	2%	4%	3%	1%	36%	5%	-	-	10%
Frankton Rd	11%	7%	7%	8%	1%	8%	-	2%	9%	4%	4%	9%	54%	6%	-	-	34%
Glenda Dr	1%	1%	1%	1%	0%	1%	1%	-	2%	1%	1%	1%	22%	1%	-	-	3%
Gorge Road	3%	3%	6%	3%	7%	3%	5%	3%	-	1%	3%	4%	47%	3%	-	-	34%
Kelvin Heights	6%	1%	2%	4%	5%	6%	5%	5%	3%	-	2%	2%	30%	4%	-	-	10%
LHE/Shotover Country	7%	2%	3%	5%	1%	13%	8%	4%	5%	4%	-	2%	49%	5%	-	-	15%
Quail Rise	1%	1%	1%	1%	0%	2%	2%	1%	2%	1%	0%	-	23%	0%	-	-	4%
Town Centre	19%	11%	18%	20%	2%	16%	19%	9%	22%	6%	7%	14%	-	10%	-	-	14%
Jacks Point	9%	1%	0%	1%	3%	5%	1%	2%	1%	1%	2%	0%	10%	-	-	-	5%
East External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
South External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
Total	6%	3%	9%	13%	2%	6%	9%	2%	11%	3%	2%	2%	37%	5%	0%	0%	14%

[illegible]

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	35	11	13	27	289	26	35	7	58	23	4	167	67	88	18	867
Arrowtown	34	0	66	22	83	310	23	103	45	15	162	17	344	20	184	22	1450
Arthurs Point	11	60	0	20	9	36	18	9	40	3	18	2	291	4	36	3	559
Fernhill	7	14	13	0	4	29	22	4	37	4	3	1	555	5	16	14	729
Five Mile	32	84	9	5	0	371	18	98	6	21	66	13	87	28	39	10	887
Frankton	300	310	36	50	354	0	160	362	52	223	233	43	786	289	159	112	3469
Frankton Rd	19	27	15	27	18	120	0	18	33	18	15	3	392	22	26	14	768
Glenda Dr	38	94	9	4	98	382	17	0	4	33	91	16	64	44	43	12	950
Gorge Road	10	32	29	42	8	55	35	7	0	10	9	1	461	12	19	9	741
Kelvin Heights	59	18	3	7	20	219	23	32	11	0	6	2	156	43	19	35	654
LHE/Shotover Country	23	170	19	4	69	227	15	104	12	5	0	14	100	7	58	8	835
Quail Rise	4	18	2	1	13	45	3	17	1	2	13	0	15	3	8	1	145
Town Centre	168	372	307	605	114	798	423	91	487	147	120	19	0	168	255	119	4194
Jacks Point	68	22	4	8	26	291	29	43	13	44	7	3	172	0	0	46	776
East External	87	176	33	14	41	169	23	47	18	12	53	8	154	0	0	21	856
South External	14	21	2	15	7	80	15	9	9	28	7	1	99	37	21	0	364
Total	876	1454	557	838	891	3419	849	979	775	623	825	146	3845	748	971	445	18243

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	1	0	12	2	0	0	0	1	0	66	1	0	0	85
Arrowtown	0	0	0	0	0	1	0	0	0	0	1	0	7	0	0	0	10
Arthurs Point	0	1	0	0	0	1	0	0	1	0	0	0	44	0	0	0	48
Fernhill	0	0	0	0	0	1	1	0	0	0	0	0	145	0	0	0	149
Five Mile	2	2	0	0	0	21	1	3	0	1	4	0	16	1	0	0	50
Frankton	6	3	0	1	8	0	6	7	1	5	7	0	137	4	0	0	186
Frankton Rd	2	1	0	1	0	9	0	0	1	1	2	0	98	1	0	0	115
Glenda Dr	0	2	0	0	2	11	0	0	0	1	4	0	16	1	0	0	38
Gorge Road	0	0	1	1	0	3	1	0	0	0	0	0	95	0	0	0	102
Kelvin Heights	1	0	0	0	1	3	1	1	0	0	0	0	16	0	0	0	22
LHE/Shotover Country	1	1	0	0	3	9	1	4	0	0	0	0	26	0	0	0	46
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Town Centre	78	23	66	167	18	312	108	38	133	26	51	2	0	20	0	0	1042
Jacks Point	0	0	0	0	0	1	0	0	0	0	0	0	3	0	0	0	5
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	90	33	69	171	34	384	121	53	138	35	70	3	671	27	0	0	1898

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	1	0	0	0	0	0	21	0	0	0	23
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	6
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	1	1	0	0	0	0	0	16	0	0	0	17
LHE/Shotover Country	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	2
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	2	0	0	0	0	11	6	0	0	9	1	0	2	1	0	0	32
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	0	0	13	8	0	0	9	1	0	50	1	0	0	84

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	35	11	13	27	289	26	35	7	58	23	4	167	67	88	18	867
Arrowtown	34	0	66	22	83	310	23	103	45	15	162	17	344	20	184	22	1450
Arthurs Point	11	60	0	20	9	36	18	9	40	3	18	2	291	4	36	3	559
Fernhill	7	14	13	0	4	29	22	4	37	4	3	1	555	5	16	14	729
Five Mile	32	84	9	5	0	371	18	98	6	21	66	13	87	28	39	10	887
Frankton	300	310	36	50	354	0	160	362	52	223	233	43	786	289	159	112	3469
Frankton Rd	19	27	15	27	18	120	0	18	33	18	15	3	392	22	26	14	768
Glenda Dr	38	94	9	4	98	382	17	0	4	33	91	16	64	44	43	12	950
Gorge Road	10	32	29	42	8	55	35	7	0	10	9	1	461	12	19	9	741
Kelvin Heights	59	18	3	7	20	219	23	32	11	0	6	2	156	43	19	35	654
LHE/Shotover Country	23	170	19	4	69	227	15	104	12	5	0	14	100	7	58	8	835
Quail Rise	4	18	2	1	13	45	3	17	1	2	13	0	15	3	8	1	145
Town Centre	168	372	307	605	114	798	423	91	487	147	120	19	0	168	255	119	4194
Jacks Point	68	22	4	8	26	291	29	43	13	44	7	3	172	0	0	46	776
East External	87	176	33	14	41	169	23	47	18	12	53	8	154	0	0	21	856
South External	14	21	2	15	7	80	15	9	9	28	7	1	99	37	21	0	364
Total	876	1454	557	838	891	3419	849	979	775	623	825	146	3845	748	971	445	18243

BUS PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
port	-	1%	1%	6%	1%	4%	9%	1%	2%	1%	5%	0%	39%	1%	-	-	10%
owtown	0%	-	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	-	-	1%
hurs Point	1%	1%	-	1%	1%	2%	2%	2%	3%	1%	2%	0%	15%	1%	-	-	9%
nhill	5%	0%	1%	-	1%	4%	3%	1%	1%	1%	4%	0%	26%	1%	-	-	20%
Five Mile	5%	2%	0%	2%	-	6%	3%	3%	4%	6%	5%	1%	18%	2%	-	-	6%
Frankton	2%	1%	1%	2%	2%	-	4%	2%	3%	2%	3%	1%	17%	1%	-	-	5%
Frankton Rd	9%	3%	2%	3%	2%	7%	-	2%	3%	3%	10%	2%	25%	4%	-	-	15%
Glenda Dr	1%	2%	1%	1%	2%	3%	3%	-	3%	4%	4%	0%	25%	1%	-	-	4%
Gorge Road	3%	1%	3%	2%	5%	5%	2%	5%	-	2%	5%	1%	21%	1%	-	-	14%
Kelvin Heights	1%	0%	0%	1%	3%	1%	2%	2%	1%	-	2%	0%	10%	0%	-	-	3%
LHE/Shotover Country	3%	1%	1%	3%	4%	4%	7%	4%	3%	2%	-	0%	26%	2%	-	-	5%
Quail Rise	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	-	3%	0%	-	-	1%
Town Centre	46%	6%	22%	28%	16%	39%	26%	41%	27%	18%	42%	12%	-	12%	-	-	25%
Jacks Point	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	1%	0%	2%	-	-	-	1%
East External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
South External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
Total	10%	2%	12%	20%	4%	11%	14%	5%	18%	6%	8%	2%	17%	4%	0%	0%	10%

South External																		South External																		0%0%0%0%0%0%0%0%0%0%0%0%0%0%0%0%0%																	
Total																		Total																		0%0%0%0%0%0%0%0%0%0%0%0%0%0%0%0%0%																	
MRT PASSENGERS (TOTAL)																		MRT PASSENGERS (SHARE)																		MRT PASSENGERS (TOTAL)																	
Airport																		Airport																		Airport																	
Arrowtown																		Arrowtown																		Arrowtown																	
Arthurs Point																		Arthurs Point																		Arthurs Point																	
Fernhill																		Fernhill																		Fernhill																	
Five Mile																		Five Mile																		Five Mile																	
Frankton																		Frankton																		Frankton																	
Frankton Rd																		Frankton Rd																		Frankton Rd																	
Glenda Dr																		Glenda Dr																		Glenda Dr																	
Gorge Road																		Gorge Road																		Gorge Road																	
Kelvin Heights																		Kelvin Heights																		Kelvin Heights																	
LHE/Shotover Country																		LHE/Shotover Country																		LHE/Shotover Country																	
Quail Rise																		Quail Rise																		Quail Rise																	
Town Centre																		Town Centre																		Town Centre																	
Jacks Point																		Jacks Point																		Jacks Point																	
East External																		East External																		East External																	
South External																		South External																		South External																	
Total																		Total																		Total																	
P&R-MRT PASSENGERS (TOTAL)																		P&R-MRT PASSENGERS (SHARE)																		P&R-MRT PASSENGERS (TOTAL)																	
Airport																		Airport																		Airport																	
Arrowtown																		Arrowtown																		Arrowtown																	
Arthurs Point																		Arthurs Point																		Arthurs Point																	
Fernhill																		Fernhill																		Fernhill																	
Five Mile																		Five Mile																		Five Mile																	
Frankton																		Frankton																		Frankton																	
Frankton Rd																		Frankton Rd																		Frankton Rd																	
Glenda Dr																		Glenda Dr																		Glenda Dr																	
Gorge Road																		Gorge Road																		Gorge Road																	
Kelvin Heights																		Kelvin Heights																		Kelvin Heights																	
LHE/Shotover Country																		LHE/Shotover Country																		LHE/Shotover Country																	
Quail Rise																		Quail Rise																		Quail Rise																	
Town Centre																		Town Centre																		Town Centre																	
Jacks Point																		Jacks Point																		Jacks Point																	
East External																		East External																		East External																	
South External																		South External																		South External																	
Total																		Total																		Total																	
CAR PASSENGERS (TOTAL)																		CAR PASSENGERS (SHARE)																		CAR PASSENGERS (TOTAL)																	
Airport																		Airport																		Airport																	
Arrowtown																		Arrowtown																		Arrowtown																	
Arthurs Point																		Arthurs Point																		Arthurs Point																	
Fernhill																		Fernhill																		Fernhill																	
Five Mile																		Five Mile																		Five Mile																	
Frankton																		Frankton																		Frankton																	
Frankton Rd																		Frankton Rd																		Frankton Rd																	
Glenda Dr																		Glenda Dr																		Glenda Dr																	
Gorge Road																		Gorge Road																		Gorge Road																	
Kelvin Heights																		Kelvin Heights																		Kelvin Heights																	
LHE/Shotover Country																		LHE/Shotover Country																		LHE/Shotover Country																	
Quail Rise																		Quail Rise																		Quail Rise																	
Town Centre																		Town Centre																		Town Centre																	
Jacks Point																		Jacks Point																		Jacks Point																	
East External																		East External																		East External																	
South External																		South External																		South External																	
Total																		Total																		Total																	

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	26	2	2	30	335	17	16	2	108	64	9	29	118	20	33	811
Arrowtown	25	0	62	21	67	277	22	54	23	30	369	20	215	30	241	31	1489
Arthurs Point	6	88	0	27	8	42	24	5	28	9	40	2	237	8	32	3	559
Fernhill	8	32	28	0	6	59	36	2	41	15	12	1	477	16	27	9	768
Five Mile	24	70	5	4	0	446	18	67	4	42	126	19	47	49	88	19	1028
Frankton	216	262	32	58	414	0	169	246	44	420	445	65	565	485	449	156	4026
Frankton Rd	14	23	19	29	19	148	0	11	30	39	27	4	329	43	18	23	775
Glenda Dr	23	82	5	2	96	397	16	0	2	59	189	24	30	67	59	25	1076
Gorge Road	4	72	58	62	8	74	59	2	0	31	30	2	389	32	35	7	866
Kelvin Heights	30	11	3	5	16	185	18	15	6	0	10	3	82	80	6	38	509
LHE/Shotover Country	20	169	14	4	59	234	13	60	6	12	0	14	55	12	66	13	750
Quail Rise	3	15	1	1	13	49	3	10	1	6	26	0	9	7	9	3	157
Town Centre	94	472	385	826	86	827	614	22	454	320	230	28	0	329	275	87	5049
Jacks Point	35	15	3	6	23	263	24	20	7	123	13	4	91	0	0	52	679
East External	75	160	34	20	72	476	33	38	18	27	62	8	217	0	0	0	1241
South External	25	24	3	20	8	97	20	8	15	38	16	2	161	52	123	0	614
Total	603	1523	655	1088	925	3909	1087	575	683	1279	1657	205	2932	1327	1449	499	20396

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	21	1	0	0	2	5	0	1	29	0	0	60
Arrowtown	0	0	1	0	0	7	0	0	0	0	5	0	3	1	0	0	20
Arthurs Point	0	2	0	1	0	1	1	0	1	0	1	0	10	0	0	0	17
Fernhill	1	1	1	0	0	7	2	0	1	1	1	0	40	1	0	0	56
Five Mile	0	0	0	0	0	6	0	0	0	2	2	0	0	1	0	0	13
Frankton	8	2	0	1	2	0	6	1	1	33	38	1	17	31	0	0	142
Frankton Rd	3	2	1	2	1	36	0	0	2	6	4	0	27	8	0	0	91
Glenda Dr	0	0	0	0	0	3	0	0	0	2	4	0	0	1	0	0	11
Gorge Road	0	1	2	1	0	3	2	0	0	1	1	0	19	2	0	0	32
Kelvin Heights	1	0	0	0	0	6	0	0	0	0	0	0	2	2	0	0	11
LHE/Shotover Country	1	2	0	0	0	18	0	1	0	0	0	0	1	0	0	0	24
Quail Rise	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Town Centre	69	145	237	540	16	355	351	9	303	91	179	8	0	170	0	0	2474
Jacks Point	3	0	0	0	1	10	2	0	0	1	1	0	6	0	0	0	24
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	87	155	242	546	22	473	365	12	309	141	242	10	127	246	0	0	2976

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	1	0	0	0	2	0	0	1	0	0	0	4
Frankton Rd	0	0	0	0	0	1	0	0	0	3	0	0	3	0	0	0	8
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	1	0	0	0	5	20	42	1	0	78	1	0	7	0	0	0	155
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	5	23	44	1	0	84	1	0	12	0	0	0	#REF!

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	0	26	2	2	30	335	17	16	2	108	64	9	29	118	20	33	811
Arrowtown	25	0	62	21	67	277	22	54	23	30	369	20	215	30	241	31	1489
Arthurs Point	6	88	0	27	8	42	24	5	28	9	40	2	237	8	32	3	559
Fernhill	8	32	28	0	6	59	36	2	41	15	12	1	477	16	27	9	768
Five Mile	24	70	5	4	0	446	18	67	4	42	126	19	47	49	88	19	1028
Frankton	216	262	32	58	414	0	169	246	44	420	445	65	565	485	449	156	4026
Frankton Rd	14	23	19	29	19	148	0	11	30	39	27	4	329	43	18	23	775
Glenda Dr	23	82	5	2	96	397	16	0	2	59	189	24	30	67	59	25	1076
Gorge Road	4	72	58	62	8	74	59	2	0	31	30	2	389	32	35	7	866
Kelvin Heights	30	11	3	5	16	185	18	15	6	0	10	3	82	80	6	38	509
LHE/Shotover Country	20	169	14	4	59	234	13	60	6	12	0	14	55	12	66	13	750
Quail Rise	3	15	1	1	13	49	3	10	1	6	26	0	9	7	9	3	157
Town Centre	94	472	385	826	86	827	614	22	454	320	230	28	0	329	275	87	5049
Jacks Point	35	15	3	6	23	263	24	20	7	123	13	4	91	0	0	52	679
East External	75	160	34	20	72	476	33	38	18	27	62	8	217	0	0	0	1241
South External	25	24	3	20	8	97	20	8	15	38	16	2	161	52	123	0	614
Total	603	1523	655	1088	925	3909	1087	575	683	1279	1657	205	2932	1327	1449	499	20396

BUS PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Total
Airport	-	1%	1%	3%	0%	6%	5%	1%	2%	2%	9%	1%	5%	25%	-	-	7%
Arrowtown	1%	-	2%	1%	0%	2%	2%	1%	1%	1%	1%	0%	2%	2%	-	-	1%
Arthurs Point	3%	2%	-	2%	1%	2%	3%	1%	4%	2%	3%	1%	4%	3%	-	-	3%
Fernhill	16%	2%	2%	-	1%	11%	6%	1%	3%	5%	8%	1%	8%	9%	-	-	7%
Five Mile	1%	1%	0%	1%	-	1%	1%	0%	2%	6%	2%	0%	1%	3%	-	-	1%
Frankton	4%	1%	1%	3%	1%	-	3%	0%	1%	8%	8%	1%	3%	6%	-	-	4%
Frankton Rd	24%	8%	5%	6%	3%	24%	-	2%	7%	17%	13%	8%	8%	19%	-	-	12%
Glenda Dr	1%	1%	1%	0%	0%	1%	1%	-	1%	3%	2%	0%	1%	1%	-	-	1%
Gorge Road	5%	2%	4%	2%	3%	4%	3%	2%	-	3%	4%	1%	5%	5%	-	-	4%
Kelvin Heights	2%	1%	1%	1%	1%	3%	2%	1%	1%	-	2%	1%	2%	2%	-	-	2%
LHE/Shotover Country	3%	1%	1%	1%	1%	8%	2%	1%	1%	4%	-	0%	2%	4%	-	-	3%
Quail Rise	1%	0%	1%	1%	0%	2%	2%	0%	1%	2%	0%	-	2%	1%	-	-	1%
Town Centre	73%	31%	61%	65%	19%	43%	57%	42%	67%	29%	78%	30%	-	52%	-	-	49%
Jacks Point	8%	1%	2%	4%	2%	4%	6%	1%	3%	1%	7%	0%	7%	-	-	-	3%
East External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
South External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
Total	14%	10%	37%	50%	2%	12%	34%	2%	45%	11%	15%	5%	4%	19%	0%	0%	15%

[illegible]

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	21	7	7	22	32	10	16	4	13	7	2	97	17	59	28	50	15	341
Arrowtown	30	0	95	28	87	72	34	81	62	13	95	12	534	17	132	29	68	27	1320
Arthurs Point	5	51	0	24	10	9	24	6	50	3	7	1	448	3	22	5	12	2	668
Fernhill	7	12	20	0	13	14	28	6	48	2	3	1	695	3	12	13	19	3	876
Five Mile	32	71	11	5	0	86	21	87	8	13	34	10	103	23	26	17	86	39	546
Frankton	55	50	8	8	68	0	33	55	12	26	27	7	155	45	21	38	119	46	609
Frankton Rd	22	28	17	25	35	60	0	26	42	7	11	4	528	13	17	12	41	14	847
Glenda Dr	15	41	6	2	61	42	9	0	3	9	22	6	41	14	21	16	56	23	310
Gorge Road	4	12	18	22	7	8	19	4	0	2	3	1	327	3	8	7	10	2	445
Kelvin Heights	102	53	10	11	67	199	42	82	19	0	19	7	256	117	18	17	142	73	1018
LHE/Shotover Country	50	327	49	14	128	137	35	153	31	8	0	24	300	14	23	21	81	51	1315
Quail Rise	8	24	4	1	22	22	6	22	2	2	13	0	29	4	4	3	14	9	165
Town Centre	67	150	194	243	112	107	182	57	249	34	30	8	0	41	176	147	162	27	1796
Jacks Point	107	52	9	11	74	212	45	88	17	60	16	7	254	0	0	30	161	81	982
East External	41	206	34	20	137	42	23	43	25	18	29	6	291	0	0	25	154	14	940
South External	22	19	2	6	12	32	10	12	8	13	5	1	94	0	0	13	29	13	272
Remarkables Park	129	90	15	12	154	229	48	143	19	38	40	12	255	77	25	37	0	148	1324
Frankton South East	64	56	9	6	87	122	23	102	11	15	27	9	129	35	8	14	153	0	718
Total	566	1118	481	427	855	1074	520	738	581	222	321	96	4151	342	549	409	1203	439	12450

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	1	0	0	1	2	1	0	0	1	0	0	66	1	0	0	2	0	72
Arrowtown	0	0	2	1	2	1	2	1	1	1	4	0	75	0	0	0	2	0	92
Arthurs Point	0	1	0	1	1	0	1	0	3	0	1	0	267	0	0	0	1	0	277
Fernhill	1	0	1	0	1	1	2	0	4	0	0	0	417	0	0	0	2	0	427
Five Mile	1	2	0	0	0	3	1	2	0	1	1	0	48	1	0	0	4	1	60
Frankton	3	2	1	1	4	0	2	3	1	2	2	0	95	3	0	0	6	2	119
Frankton Rd	2	1	1	2	2	4	0	2	2	1	1	0	249	1	0	0	3	1	266
Glenda Dr	0	1	0	0	1	1	0	0	0	0	1	0	18	0	0	0	2	1	24
Gorge Road	0	0	1	1	0	0	1	0	0	0	0	0	188	0	0	0	1	0	193
Kelvin Heights	8	3	1	1	11	19	6	12	2	0	2	1	169	4	0	0	22	10	237
LHE/Shotover Country	1	5	1	1	3	4	1	3	1	0	0	0	84	0	0	0	2	1	104
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5
Town Centre	10	10	22	32	12	13	19	7	30	5	4	0	0	4	0	0	24	3	169
Jacks Point	7	2	1	1	5	19	5	5	1	2	1	0	73	0	0	0	10	4	122
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	1	1	0	0	2	2	1	2	0	1	0	0	41	0	0	0	0	2	51
Frankton South East	1	1	0	0	2	3	1	2	0	1	0	0	59	1	0	0	5	0	71
Total	34	29	31	41	42	68	40	38	47	13	17	1	1754	13	0	0	81	24	2168

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	30
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	2	1	0	0	0	0	0	24	0	0	0	0	0	28
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	1	2	0	0	1	0	0	6	0	0	0	0	0	10
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	3	3	0	0	2	0	0	67	0	0	0	0	0	75

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
Arrowtown	1	0	0	0	0	2	1	0	1	0	0	0	139	0	0	0	4	0	146
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	1	0	0	0	1	1	0	1	1	0	0	0	98	0	0	0	2	1	103
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	3
Jacks Point	4	0	0	0	5	3	0	5	1	0	0	0	125	0	0	0	10	4	144
East External	1	0	0	0	4	1	0	1	1	0	0	0	117	0	0	0	10	0	125
South External	1	0	0	0	1	1	0	1	1	0	0	0	60	0	0	2	0	0	66
Remarkables Park	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
Frankton South East	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	3
Total	8	0	0	0	13	8	0	9	5	0	4	0	539	2	0	5	27	6	593

MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

P&R-MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CAR PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	21	6	6	21	31	10	16	4	12	7	2	31	16	59	27	48	15	267
Arrowtown	28	0	93	27	83	68	32	77	60	12	91	12	319	17	132	29	61	26	1082
Arthurs Point	5	50	0	22	9	8	23	5	47	3	6	1	180	3	22	5	11	2	391
Fernhill	6	12	19	0	12	12	26	5	44	2	2	1	279	3	12	13	17	3	448
Five Mile	31	69	11	5	0	84	20	84	8	12	32	10	53	22	26	17	81	38	484
Frankton	52	48	7	7	65	0	30	52	11	24	25	7	54	42	21	38	113	44	483
Frankton Rd	21	27	16	23	33	56	0	24	40	6	10	4	251	12	17	12	39	13	551
Glenda Dr	15	40	5	2	60	41	9	0	3	8	21	6	23	14	21	16	54	23	285
Gorge Road	3	11	17	21	7	8	18	4	0	2	2	1	139	3	8	7	9	2	251
Kelvin Heights	95	50	9	10	56	178	36	70	17	0	17	6	63	113	18	17	120	63	753
LHE/Shotover Country	49	322	47	14	124	132	34	149	30	8	0	23	118	14	23	21	76	50	1108
Quail Rise	8	23	4	1	21	22	5	22	2	2	13	0	24	4	4	3	14	9	159
Town Centre	56	140	172	211	100	93	160	49	219	29	24	7	0	37	176	146	138	23	1620
Jacks Point	95	51	8	10	64	189	40	78	15	57	16	7	55	0	0	30	141	73	716
East External	40	206	34	20	133	41	23	42	24	18	29	6	174	0	0	25	144	13	815
South External	21	19	2	6	11	31	10	12	7	13	5	1	34	27	9	0	27	12	208
Remarkables Park	129	89	15	12	153	227	47	142	18	37	38	12	214	77	25	36	0	147	1270
Frankton South East	63	55	9	5	84	119	23	100	10	14	26	9	70	34	8	13	148	0	644
Total	525	1089	450	387	799	995	476	690	529	208	301	94	1796	327	549	406	1094	409	9622

Frankton	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

P&R-MRT PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arrowtown	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fernhill	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Five Mile	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

CAR PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	
Airport	-	97%	95%	93%	97%	95%	92%	98%	94%	96%	95%	99%	32%	93%	100%	95%	97%	98%	78%
Arrowtown	96%	-	98%	98%	95%	95%	97%	96%	96%	95%	96%	100%	60%	98%	100%	100%	91%	96%	82%
Arthurs Point	95%	98%	-	94%	95%	95%	95%	94%	94%	94%	91%	99%	40%	97%	100%	100%	93%	94%	59%
Fernhill	90%	97%	94%	-	93%	92%	93%	92%	92%	90%	90%	98%	40%	96%	100%	100%	90%	92%	51%
Five Mile	98%	98%	96%	95%	-	97%	96%	98%	96%	9	95%	99%	53%	95%	100%	93%	95%	97%	88%
Frankton	94%	95%	93%	90%	94%	94%	92%	94%	91%	93%	91%	98%	35%	94%	100%	99%	95%	96%	79%
Frankton Rd	92%	95%	95%	94%	94%	93%	-	93%	94%	90%	92%	98%	47%	93%	100%	100%	93%	94%	65%
Glenda Dr	99%	98%	97%	96%	98%	97%	97%	-	96%	95%	96%	99%	56%	95%	100%	97%	97%	98%	92%
Gorge Road	93%	97%	94%	95%	94%	94%	95%	93%	-	90%	89%	98%	43%	96%	100%	99%	91%	93%	56%
Kelvin Heights	93%	94%	92%	89%	83%	90%	84%	85%	89%	-	91%	92%	25%	97%	100%	100%	84%	86%	74%
LHE/Shotover Country	98%	98%	97%	96%	97%	96%	97%	97%	95%	96%	-	100%	39%	98%	100%	100%	94%	97%	84%
Quail Rise	99%	100%	99%	99%	99%	99%	99%	99%	99%	97%	100%	-	83%	99%	100%	96%	98%	99%	96%
Town Centre	84%	93%	89%	87%	89%	88%	88%	87%	88%	83%	79%	97%	60%	90%	100%	100%	85%	88%	90%
Jacks Point	89%	97%	94%	92%	87%	89%	89%	89%	85%	96%	95%	97%	22%	-	0%	100%	98%	90%	73%
East External	97%	100%	100%	100%	97%	98%	100%	97%	96%	100%	100%	99%	60%	0%	100%	93%	97%	87%	77%
South External	96%	100%	100%	100%	95%	97%	100%	96%	92%	100%	100%	100%	36%	100%	100%	-	94%	95%	77%
Remarkables Park	99%	99%	98%	98%	99%	99%	99%	99%	98%	98%	94%	99%	84%	99%	100%	99%	-	99%	96%
Frankton South East	99%	99%	97%	95%	97%	98%	97%	98%	96%	95%	96%	99%	54%	95%	100%	96%	97%	-	90%
Total	93%	97%	94%	90%	94%	93%	92%	94%	91%	94%	94%	98%	43%	96%	100%	99%	91%	93%	77%

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	35	11	13	48	79	26	35	7	58	21	4	167	67	88	18	142	47	676
Arrowtown	34	0	66	22	154	76	23	105	45	15	145	17	344	20	184	22	124	36	1273
Arthurs Point	11	60	0	20	17	9	18	10	40	3	16	2	291	4	36	3	15	3	539
Fernhill	7	14	13	0	9	9	22	4	37	4	3	1	555	5	16	14	12	3	713
Five Mile	52	159	19	12	0	147	37	169	11	37	103	22	182	46	75	15	324	76	1085
Frankton	79	83	9	15	149	0	57	88	16	88	76	13	225	110	43	38	233	75	1090
Frankton Rd	19	27	15	27	36	45	0	19	33	18	13	3	392	22	26	14	45	13	709
Glenda Dr	39	96	9	5	170	88	18	0	5	33	85	16	71	44	44	12	165	63	737
Gorge Road	10	32	29	42	17	17	35	7	0	10	8	1	461	12	19	9	23	6	711
Kelvin Heights	59	18	3	7	36	89	23	33	11	0	5	2	156	43	19	35	90	24	539
LHE/Shotover Country	21	153	17	4	107	69	14	97	11	4	0	12	93	6	52	7	67	25	669
Quail Rise	4	18	2	1	22	13	3	17	1	2	12	0	15	3	8	1	15	6	123
Town Centre	168	372	307	605	238	238	423	98	487	147	111	19	0	168	255	119	338	90	3756
Jacks Point	68	22	4	8	45	115	29	43	13	44	6	3	172	0	0	46	120	36	618
East External	87	176	33	14	76	42	23	48	18	12	48	8	154	0	0	21	68	22	761
South External	14	21	2	15	12	29	15	9	9	28	6	1	99	37	21	9	15	32	317
Remarkables Park	151	114	14	22	287	249	66	146	23	95	6	14	364	124	60	46	0	140	1842
Frankton South East	49	36	3	5	73	78	17	62	7	503	24	27	95	36	89	22	147	0	560
Total	674	1286	538	810	1136	1065	765	783	744	503	659	125	3379	587	186	376	1812	541	14316

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	2	1	3	1	18	7	1	1	8	1	0	116	3	0	0	7	1	160
Arrowtown	1	0	1	1	3	4	1	2	1	1	4	0	37	0	0	0	7	0	55
Arthurs Point	1	1	0	2	2	1	2	1	3	0	4	0	119	0	0	0	2	0	137
Fernhill	1	0	1	0	1	2	2	0	4	1	0	0	202	0	0	0	2	0	215
Five Mile	4	8	1	1	0	11	3	6	1	5	11	0	53	2	0	0	27	7	106
Frankton	6	8	1	2	6	0	7	4	2	8	10	0	97	7	0	0	16	3	159
Frankton Rd	2	3	1	2	2	4	0	1	2	2	2	0	121	2	0	0	5	1	145
Glenda Dr	1	4	1	0	5	7	1	0	0	5	9	0	24	2	0	0	7	2	61
Gorge Road	2	1	2	5	2	3	1	0	2	1	0	0	183	1	0	0	5	1	206
Kelvin Heights	4	2	0	1	4	11	3	3	1	0	1	0	63	1	0	0	14	2	92
LHE/Shotover Country	0	3	1	0	4	6	1	3	1	0	0	0	24	0	0	0	6	1	45
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
Town Centre	84	45	113	231	88	147	151	44	179	76	30	4	0	26	0	0	176	33	1218
Jacks Point	4	1	0	1	1	11	2	1	1	2	0	0	32	0	0	0	6	1	56
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	8	12	2	4	20	26	8	7	3	14	7	1	176	5	0	0	0	9	294
Frankton South East	1	2	0	1	3	10	2	2	0	5	2	0	46	1	0	0	9	0	75
Total	111	79	124	249	119	226	183	67	196	110	73	6	1072	44	0	0	282	52	2657

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Frankton	0	0	0	0	0	0	1	0	0	0	0	0	8	0	0	0	0	0	18
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	16
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	1	1	0	0	0	0	0	12	0	0	0	0	0	15
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	3	8	17	0	0	11	0	0	7	0	0	0	0	0	46
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	3	10	19	0	0	13	0	0	45	0	0	0	0	5	91

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	7
Arrowtown	1	0	0	0	0	0	0	3	2	0	0	0	61	3	0	0	25	0	76
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	19	0	0	0	0	0	0	0	0	6	0	0	0	8	1	0	0	40
Frankton	0	7	0	0	0	0	0	0	0	0	4	0	0	5	3	2	0	0	21
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	10	0	0	0	0	0	0	0	0	5	0	0	5	4	1	0	0	24
Gorge Road	0	1	0	0	0	0	0	0	0	0	1	0	0	1	3	1	0	0	8
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	2	2	0	1	1	0	0	0	22	0	0	0	6	1	29
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	60	0	0	0	0	0	0	0	36	0	0	0	49	88	39	0	0	273
Jacks Point	2	0	0	0	3	5	1	2	2	0	0	0	62	0	0	0	8	2	77
East External	4	0	0	1	3	3	1	2	2	0	0	0	52	0	0	0	9	1	67
South External	0	0	0	0	0	1	0	0	0	0	0	0	34	0	0	4	0	0	41
Remarkables Park	0	23	0	0	0	0	0	0	0	0	8	0	0	21	10	7	0	0	69
Frankton South East	0	2	0	0	0	0	0	0	0	0	1	0	0	2	1	1	0	0	6
Total	8	99	0	1	14	15	2	9	7	0	53	0	230	68	108	49	48	5	663

MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

P&R-MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CAR PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	32	10	10	47	61	19	35	6	50	19	4	52	62	85	17	135	46	509
Arrowtown	32	0	64	22	146	69	22	100	42	14	142	17	247	19	184	22	91	34	1141
Arthurs Point	10	59	0	18	15	8	17	8	37	2	13	2	172	3	36	3	12	3	402
Fernhill	6	14	12	0	8	8	20	4	33	3	3	1	353	5	16	14	10	3	499
Five Mile	48	132	18	11	0	136	34	163	10	32	86	22	128	38	67	14	297	69	938
Frankton	73	68	8	13	143	0	49	84	14	79	62	13	121	98	40	36	216	72	900
Frankton Rd	17	24	14	25	34	40	0	17	31	15	11	3	255	20	26	14	40	12	547
Glenda Dr	38	82	9	5	165	81	16	0	4	28	72	16	47	38	40	12	158	61	652
Gorge Road	9	30	26	38	15	14	32	6	0	8	6	1	278	10	17	8	18	5	496
Kelvin Heights	55	17	3	6	32	77	20	30	10	0	4	2	81	42	19	35	76	22	433
LHE/Shotover Country	20	150	16	4	102	60	13	93	10	4	0	12	47	6	52	7	55	24	595
Quail Rise	4	18	2	1	22	13	3	17	1	2	12	0	13	3	8	1	14	6	120
Town Centre	84	267	193	374	147	84	254	54	308	60	45	15	0	93	167	81	162	57	2226
Jacks Point	62	21	3	7	41	99	25	40	11	42	6	3	79	0	0	46	34	34	486
East External	84	176	33	13	73	39	22	46	16	12	48	8	103	0	0	21	58	21	693
South External	13	21	2	15	12	28	15	9	8	28	6	1	65	37	21	0	30	14	280
Remarkables Park	143	79	12	19	267	224	58	139	20	81	50	13	188	98	50	39	0	131	1479
Frankton South East	48	33	3	4	70	68	15	60	6	19	25	6	49	34	19	21	138	0	479
Total	556	1108	414	560	1000	815	560	707	541	380	533	119	2039	474	777	332	1480	484	10916

Frankton	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

P&R-MRT PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arrowtown	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fernhill	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Five Mile	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

CAR PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	
Airport	-	90%	94%	78%	97%	77%	74%	98%	92%	86%	93%	99%	31%	92%	97%	97%	95%	98%	75%
Arrowtown	94%	-	98%	97%	95%	90%	95%	95%	93%	95%	97%	100%	72%	98%	100%	100%	73%	95%	90%
Arthurs Point	90%	98%	-	89%	90%	85%	92%	88%	92%	82%	78%	95%	59%	95%	100%	100%	84%	89%	75%
Fernhill	88%	97%	93%	-	93%	82%	91%	91%	89%	86%	86%	96%	64%	95%	100%	100%	85%	92%	70%
Five Mile	92%	83%	94%	92%	-	92%	93%	97%	93%	86%	83%	99%	70%	83%	90%	93%	92%	91%	86%
Frankton	92%	81%	88%	85%	96%	-	87%	95%	87%	89%	82%	97%	54%	89%	93%	95%	93%	97%	83%
Frankton Rd	89%	89%	94%	92%	95%	90%	-	94%	92%	88%	84%	97%	65%	91%	100%	100%	90%	95%	77%
Glenda Dr	98%	85%	93%	92%	97%	92%	92%	-	92%	85%	84%	99%	66%	85%	91%	93%	95%	97%	88%
Gorge Road	85%	92%	92%	89%	88%	82%	91%	85%	-	77%	65%	94%	60%	83%	85%	90%	79%	87%	70%
Kelvin Heights	93%	91%	93%	90%	90%	87%	85%	92%	90%	-	86%	90%	52%	99%	100%	100%	84%	90%	80%
LHE/Shotover Country	96%	98%	93%	90%	95%	87%	91%	95%	87%	90%	-	100%	50%	96%	100%	100%	82%	96%	89%
Quail Rise	99%	100%	99%	99%	99%	97%	97%	99%	99%	93%	100%	-	88%	97%	100%	100%	94%	99%	98%
Town Centre	50%	72%	63%	62%	62%	35%	60%	55%	63%	41%	40%	78%	55%	65%	67%	48%	63%	59%	61%
Jacks Point	91%	96%	94%	88%	91%	86%	88%	93%	82%	96%	95%	98%	46%	0%	100%	88%	82%	79%	79%
East External	96%	100%	100%	96%	96%	93%	94%	96%	89%	100%	100%	100%	67%	0%	100%	96%	93%	91%	91%
South External	97%	100%	100%	100%	97%	96%	100%	98%	91%	100%	100%	100%	66%	100%	100%	-	95%	96%	88%
Remarkables Park	94%	69%	88%	83%	93%	90%	88%	95%	86%	85%	77%	92%	52%	79%	84%	85%	-	94%	80%
Frankton South East	88%	91%	95%	84%	96%	87%	86%	97%	94%	80%	91%	98%	51%	93%	96%	96%	94%	-	86%
Total	82%	86%	77%	69%	88%	77%	73%	90%	73%	76%	81%	95%	60%	81%	88%	88%	82%	89%	76%

TOTAL DEMAND	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	26	2	2	42	68	17	18	2	108	62	9	29	118	20	33	175	77	556
Arrowtown	25	0	62	21	123	53	22	58	23	30	343	20	215	30	241	31	124	41	1299
Arthurs Point	6	88	0	27	16	7	24	6	28	9	37	2	237	8	32	3	21	6	530
Fernhill	8	32	28	0	15	10	36	2	41	15	11	1	477	16	27	9	33	8	728
Five Mile	42	133	11	10	0	129	34	128	8	72	202	32	102	83	240	28	446	111	1254
Frankton	52	73	7	12	153	0	60	63	10	181	148	22	129	199	46	54	306	124	1206
Frankton Rd	14	23	19	29	37	43	0	12	30	39	26	4	329	43	18	23	64	22	687
Glenda Dr	24	84	5	4	150	70	18	0	2	60	182	25	35	68	60	26	180	96	812
Gorge Road	4	72	58	62	14	15	59	3	0	31	28	2	389	32	35	7	37	15	812
Kelvin Heights	30	11	3	5	31	60	18	16	6	0	9	3	82	80	6	38	90	20	398
LHE/Shotover Country	18	150	13	3	95	50	12	57	6	11	0	13	51	10	58	12	89	29	559
Quail Rise	3	15	1	1	21	11	3	11	1	6	25	0	9	7	9	3	20	9	126
Town Centre	94	472	385	826	161	173	614	33	454	320	219	28	0	329	275	87	410	157	4472
Jacks Point	35	15	3	6	43	80	24	21	7	123	12	4	91	0	0	52	127	35	515
East External	75	160	34	20	192	39	33	39	18	27	58	8	217	0	0	16	292	24	936
South External	25	24	3	20	13	38	20	9	15	38	15	2	161	5	2	15	39	15	475
Remarkables Park	115	97	17	35	370	249	75	102	26	167	139	22	318	200	236	62	0	212	2232
Frankton South East	30	28	3	4	66	65	17	39	5	42	49	174	56	51	14	32	180	0	509
Total	456	1378	634	1049	1106	845	994	477	652	1069	1377	478	2554	1074	1106	420	2452	789	15365

BUS PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	1	0	1	2	23	7	0	0	22	3	0	19	3	0	0	6	2	82
Arrowtown	1	0	1	1	4	3	1	2	0	2	15	0	15	0	0	0	7	1	44
Arthurs Point	1	1	0	3	2	1	1	1	2	1	10	0	41	0	0	0	3	1	63
Fernhill	1	1	1	0	1	1	2	0	3	1	2	0	66	1	0	0	4	1	81
Five Mile	4	3	0	1	0	9	2	3	0	8	11	0	10	3	0	0	24	10	55
Frankton	3	4	1	2	9	0	7	4	1	18	21	0	28	9	0	0	14	5	106
Frankton Rd	1	1	1	2	2	3	0	1	1	3	4	0	36	3	0	0	5	1	60
Glenda Dr	0	2	0	0	3	6	1	0	0	9	9	0	4	3	0	0	6	2	38
Gorge Road	1	2	4	6	2	1	3	0	0	5	7	0	64	1	0	0	6	2	96
Kelvin Heights	1	1	0	0	5	8	2	2	1	0	2	0	20	0	0	0	11	2	43
LHE/Shotover Country	0	2	1	0	3	5	1	2	0	1	0	0	7	0	0	0	7	1	23
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Town Centre	65	65	224	484	95	102	296	19	252	174	104	7	0	59	0	0	271	93	1947
Jacks Point	1	0	0	0	3	9	2	1	0	4	1	0	12	0	0	0	5	1	35
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	1	0	1	3	4	2	1	0	8	4	0	16	1	0	0	0	2	41
Frankton South East	0	1	0	1	3	13	4	1	0	11	2	0	24	1	0	0	7	0	62
Total	79	83	233	499	132	170	328	35	262	248	190	9	321	84	0	0	369	121	2672

FERRY PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	1	0	0	0	0	0	0	3	0	0	0	0	0	5
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	2	7	34	0	0	28	0	0	8	0	0	0	0	0	80
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	2	9	36	0	0	31	0	0	17	0	0	0	0	0	95

P&R PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4
Arrowtown	1	0	0	0	4	3	0	1	1	0	0	0	23	0	0	0	21	0	32
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	7	0	0	0	0	0	0	0	0	5	0	0	0	11	2	0	0	32
Frankton	0	3	0	0	0	0	0	0	0	0	3	0	0	10	2	3	0	0	21
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	4	0	0	0	0	0	0	0	0	4	0	0	7	2	2	0	0	19
Gorge Road	0	2	0	0	0	0	0	0	0	0	3	0	0	3	3	0	0	0	11
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	1	2	0	1	0	0	0	0	8	0	0	0	6	0	12
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	133	0	0	0	0	0	0	0	0	82	0	0	172	146	52	0	0	585
Jacks Point	1	0	0	0	3	3	1	1	1	0	0	0	21	0	0	0	6	1	31
East External	2	0	0	0	1	7	3	2	1	2	0	0	48	0	0	0	35	1	65
South External	1	0	0	0	1	2	0	0	0	0	0	0	42	0	0	8	0	0	55
Remarkables Park	0	14	0	0	0	0	0	0	0	0	12	0	0	44	31	12	0	0	113
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	3
Total	5	149	0	1	15	13	3	4	6	0	96	0	141	202	164	68	67	3	867

MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Countr	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

P&R-MRT PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrowtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arthurs Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fernhill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Five Mile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton Rd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenda Dr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gorge Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kelvin Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHE/Shotover Country	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quail Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Centre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jacks Point	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South External	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remarkables Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frankton South East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CAR PASSENGERS (TOTAL)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	0	25	2	2	40	45	10	18	2	86	59	9	10	111	20	32	169	75	471
Arrowtown	24	0	62	21	115	48	21	55	22	29	328	20	177	30	241	31	96	39	1223
Arthurs Point	5	87	0	24	14	6	23	5	27	7	27	2	196	8	32	3	18	5	467
Fernhill	7	31	26	0	14	9	34	2	38	13	9	1	411	15	27	9	29	7	646
Five Mile	38	123	10	9	0	121	33	125	7	64	186	32	92	72	229	26	421	101	1168
Frankton	49	65	6	10	143	0	52	59	9	162	124	21	99	180	44	51	291	119	1075
Frankton Rd	13	22	18	27	34	39	0	11	28	35	22	4	289	40	18	23	60	21	622
Glenda Dr	23	79	5	3	147	64	17	0	2	51	170	24	31	58	57	23	175	94	755
Gorge Road	4	68	54	57	12	13	56	2	0	26	19	2	325	28	32	6	31	13	706
Kelvin Heights	29	10	3	5	26	51	15	14	6	0	7	2	59	80	6	38	79	19	350
LHE/Shotover Country	18	148	12	3	91	43	11	55	5	10	0	13	36	10	58	12	76	28	525
Quail Rise	3	15	1	1	20	10	3	11	1	6	25	0	9	7	3	19	9	9	124
Town Centre	30	273	161	342	64	63	283	15	202	118	33	21	0	7	98	129	35	140	1867
Jacks Point	32	14	3	5	37	68	20	19	6	119	11	4	58	0	0	52	116	33	450
East External	73	160	34	19	186	36	31	38	16	27	58	8	169	0	0	16	257	23	871
South External	24	24	3	20	13	36	20	8	14	38	15	2	120	52	40	0	37	14	428
Remarkables Park	115	82	17	34	367	246	73	101	25	159	124	21	303	155	205	50	0	210	2078
Frankton South East	29	27	3	3	63	52	13	38	4	30	47	8	33	49	14	31	172	0	444
Total	372	1145	401	549	957	653	628	438	385	791	1091	165	2082	789	942	360	2014	664	11748

Frankton	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

P&R-MRT PASSENGERS (SHARE)	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	LHE/Shotover Country	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East	Total
Airport	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arrowtown	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fernhill	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Five Mile	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenda Dr	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gorge Road	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
LHE/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%
Quail Rise	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%
Town Centre	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%
East External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%
South External	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%
Remarkables Park	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%
Frankton South East	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

CAR PASSENGERS (SHARE)	LHE/Shotover Country																		
	Airport	Arrowtown	Arthurs Point	Fernhill	Five Mile	Frankton	Frankton Rd	Glenda Dr	Gorge Road	Kelvin Heights	Quail Rise	Town Centre	Jacks Point	East External	South External	Remarkables Park	Frankton South East		
Airport	-	97%	93%	64%	95%	66%	57%	98%	92%	80%	95%	99%	36%	95%	99%	98%	97%	97%	85%
Arrowtown	95%	-	99%	97%	94%	90%	93%	95%	95%	95%	96%	100%	82%	99%	100%	100%	78%	95%	94%
Arthurs Point	90%	98%	-	90%	88%	91%	95%	87%	94%	87%	72%	97%	83%	97%	100%	100%	85%	89%	88%
Fernhill	89%	98%	95%	-	92%	88%	94%	92%	93%	90%	83%	98%	86%	96%	100%	100%	89%	92%	89%
Five Mile	89%	93%	96%	9	-	93%	98%	95%	89%	90%	89%	90%	87%	95%	93%	91%	93%	93%	93%
Frankton	95%	90%	91%	87%	94%	-	87%	93%	90%	89%	84%	98%	77%	90%	96%	95%	95%	96%	89%
Frankton Rd	91%	94%	95%	94%	93%	92%	-	92%	95%	90%	84%	98%	88%	93%	100%	100%	93%	94%	91%
Glenda Dr	99%	94%	95%	94%	98%	92%	94%	-	94%	84%	93%	99%	88%	86%	96%	91%	97%	98%	93%
Gorge Road	88%	95%	94%	91%	87%	90%	94%	87%	-	84%	66%	96%	84%	88%	92%	94%	83%	86%	87%
Kelvin Heights	95%	93%	93%	90%	82%	86%	84%	87%	90%	-	82%	90%	72%	100%	100%	100%	88%	91%	88%
LHE/Shotover Country	97%	99%	94%	92%	96%	86%	92%	96%	88%	92%	-	100%	71%	97%	100%	100%	85%	97%	94%
Quail Rise	99%	100%	99%	99%	99%	97%	98%	99%	99%	95%	99%	-	96%	98%	100%	100%	96%	99%	99%
Town Centre	31%	58%	42%	41%	40%	37%	46%	44%	44%	37%	15%	74%	-	30%	47%	41%	34%	41%	42%
Jacks Point	93%	97%	94%	82%	87%	85%	85%	91%	83%	97%	92%	97%	64%	-	0%	100%	94%	94%	87%
East External	97%	100%	100%	96%	97%	93%	94%	97%	89%	100%	100%	100%	78%	0%	100%	88%	97%	93%	93%
South External	98%	100%	100%	100%	96%	94%	100%	97%	89%	100%	100%	100%	74%	100%	100%	-	96%	97%	90%
Remarkables Park	100%	84%	99%	97%	99%	99%	97%	99%	99%	95%	89%	99%	95%	78%	87%	81%	-	99%	93%
Frankton South East	98%	97%	95%	74%	95%	80%	75%	97%	94%	73%	96%	99%	58%	95%	99%	97%	96%	-	87%
Total	82%	83%	63%	52%	87%	77%	63%	92%	59%	74%	79%	95%	82%	73%	85%	86%	82%	84%	76%

Wakatipu Basin Future Public Transport Demand Analysis

Technical Note 3c – PT Economic Benefits Analysis

Document History and Status

Revision	Date	Author	Reviewed by	Approved by	Status
1	14 Oct 2020	s 9(2)(a)		s 9(2)(a)	Draft
2	17 Nov 2020	s 9(2)(a)		s 9(2)(a)	Final

Introduction

This technical note sets out the methodology for converting PT patronage from the model into an economic evaluation carried out for the Queenstown Town Centre, Frankton to Queenstown, and Frankton - Transport Business Case (the Business Case).

This tech note is preceded by **Technical Note 3 – Land Use, Demand and Capacity** (which covers the initial build and testing of the Future PT Model) and follow-ups **Technical Note 3a** (which covers initial testing of shortlist options for the Business Case) and **Technical Note 3b** (which covers the updated results for the Business Case, as well spatial plan and COVID-19 sensitivities).

This note concentrates on the process in converting PT model output into an economic evaluation for PT benefits. PT costs (capital and operational) are considered elsewhere within the economic evaluation for the Business Case.

1.1 Overview

This technical note is split into 8 sections:

- Future Scenarios
- Process for Economic Assessment
- Travel Time Analysis
- Trip Reliability Analysis
- Increased Frequency Analysis
- Interchange, Infrastructure and Vehicle Benefits
- Farebox Revenue
- Unmet PT Demand

2 Future Scenarios

This tech note presents modelling from the Future PT Demand Model used for the Queenstown Transport Business Case economics. All future demand sets within the PT model are derived from the Tracks model as developed and maintained by Abley Transportation Consultants (ATC) on behalf of QLDC and Waka Kotahi NZ Transport Agency. All demands have been fed directly from the 2018, 2028 and 2048 scenarios developed by ATC.

The ATC report 'Queenstown Lakes District Model: Business Case Modelling Report'. September 2020" update sets out the assumptions that underlie these future demand sets – this report also sets out some high-level results in terms of vehicle volumes on the network.

2.1 General Method

The purpose of the model is to estimate the capture rate (or mode share) of public transport modes, given the total trip levels in 2018, 2028 and 2048 (and allow interpolation for intermediate years).

The process of running a future year model is summarised in the following steps:

- 1 Create a "PT interventions scenario" for a future year
- 2 PT intervention assumptions added into spreadsheet model (for example, reduced wait times for frequency improvements, additional MRT mode, reduced travel time due to bus lanes etc)
- 3 Spreadsheet model calculates the mode share between modes for each O-D journey pair, and outputs statistics on PT usage (per route) and vehicle assignment (per link)
- 4 Assign resultant vehicle matrix into spreadsheet to recalculate link travel times
- 5 Re-assign full trip matrix into spreadsheet model, and re-calculate the mode share between modes for each O-D journey pair, and outputs statistics on PT usage (per route) and vehicle assignment (per link)
- 6 Iterate between tasks 4 and 5 until convergence met (<1% change in overall PT mode share)

2.2 Future Scenarios Tested

All scenarios were tested at 2018 (for the purpose of economic evaluation), 2028 and 2048 future years, and for AM peak (0800-0900), Interpeak (1200-1300) and PM peak (1700-1800) hours.

Under the latest demand sets, the only infrastructure scenarios tested were Do Minimum and New Zealand Upgrade Programme (NZUP), but with a number of variations of the Queenstown Town Centre Arterial Link project:

- "Art1" – Do Minimum, including stage 1 of the Arterial
- "Art1X" – Do Minimum, including stage 1 of the Arterial, with Stanley Street closed for general traffic within town centre PT hub
- "NZUP" – NZUP programme, including stage 1 of the Arterial
- "NZUPX" – NZUP programme, including stage 1 of the Arterial, with Stanley Street closed for general traffic within town centre PT hub
- "Art12" – NZUP programme, including stages 1 and 2 of the Arterial
- "Art12X" – NZUP programme, including stages 1 and 2 of the Arterial, with Stanley Street closed for general traffic within town centre PT hub
- "Art12X" – NZUP programme, including stages 1, 2 and 3 of the Arterial, with Stanley Street closed for general traffic within town centre PT hub

The NZUP scenario most closely represents the Bus Max scenario reported previously. The PT network for NZUP is shown in **Appendix A**.

3 Process for Economic Assessment

3.1 Benefit Streams

In terms of economic evaluations, the PT benefit streams have been calculated for the following:

- Travel Time Analysis
- Trip Reliability Analysis
- Increased Frequency Analysis
- Interchange Benefits
- Unmet PT Demand
- Infrastructure and Vehicle Benefits
- Farebox Revenue

3.2 Process

For all of the above benefit streams, forecasts from the PT model (patronage) and project model (travel times) have been melded together to create the economic evaluation. The general process is set out below:

- 1 Tabulate PT travel times on each section of the project model network, by scenario and time period

Figure 1 shows the travel time sections used in the economic analysis:



Figure 1: PT travel time sections

- Lines in solid (1E/1W to 8N/8S) are travel times directly extracted from the project model
- Lines in green dashed (9W/9E to 11E/11W) are travel times directly extracted from a separate VISSIM model of the Ladies Mile area
- Other dashed lines are travel times estimated from existing PT timetables, for journeys to the end of current/proposed routes. These are generally outside of any heavy congestion areas,

and therefore are predominantly used to multiply up travel times for varying patronage levels (Do Minimum versus NZUP)

Travel times were collated for minimum, maximum and average recordings for each travel time section, per scenario, year and time period. Full output is shown in **Appendix B**.

- 2 **Assign forecast patronage from the PT model to each travel time section (per scenario, per time period).** Each PT journey can therefore be applied to one or more sections. For journeys starting and/or ending at a zone along a section, then 50% of the travel time is applied. Whilst this is a simplification, it was considered of reasonable accuracy for this analysis.

Patronage at the O-D level is shown in **Appendix C** for the 2028 NZUP scenario (as an example), with the Origin and Destination IDs linked to those set out in Figure 1:

- ID numbers refer to a trip ending and/or starting on a section
- ID letters refer to a trip ending and/or starting on the associated area of the network outside the scope of the local model – e.g. AP = trips starting or ending between the end of link 2N/2S and Arthurs Point
- Q = Queenstown town centre, H = Frankton hub, A= Airport, RP = Remarkables Park

From this information, the various streams of economic benefits were calculated as set out in the following sections.

3.3 Travel Time Analysis

For the travel time economics, calculations were as below:

- Apply patronage for each OD trip to each travel time section
- Apply 50% factor for sections where a trip starts or ends (to represent only a part-trip on a section)
- Apply assumed service frequencies (for the particular scenario) to each section, with a seated capacity of 40 and standing capacity of 30
- Calculate load factor of each section:
 - For services operating at a seated only load factor of 80% or below (i.e. 32 passengers), apply no additional factor to the travel time
 - For services operating at a seated only load factor of 80% to 100% (i.e. 32 to 40 passengers), apply an additional factor of 1.1 to the travel time to these excess passengers (representing a reduction in comfort factor)
 - For services operating with some standing passengers, apply an additional factor of 1.4 to all standing passengers
- Multiply factored patronage on each section by the factored travel time, and sum for all links to obtain a total PT travel time for the scenario (per time period and year).
- Monetise the travel time using:
 - EEM update factor of 1.54
 - Fare of \$2 (all journeys)
 - VoT of \$7.93/h (a combined VoT from the EEM, factored by trip type proportion and expansion factor)

This analysis provides the following output shown in Figure 2.

Year	PT Travel Time (Cost)						
	Art1	Art1X	NZUP	NZUPX	Art12	Art12X	Art123X
2018	\$ 874,519	\$ 881,426	\$ 6,118,978	\$ 6,185,370	\$ 6,169,033	\$ 6,162,279	\$ 6,147,060
2028	\$ 9,298,769	\$ 9,218,107	\$ 27,420,847	\$ 27,558,862	\$ 27,283,415	\$ 27,340,394	\$ 27,138,156
2048	\$ 27,977,898	\$ 27,194,482	\$ 53,481,457	\$ 52,940,008	\$ 52,475,454	\$ 52,511,451	\$ 54,055,510

Figure 2: PT Travel time benefits (\$/year)

As would be expected, there are significantly increased PT travel time costs as a result of the NZUP package, due to the step change (increase) in patronage – so whilst PT travel times are generally reduced due to less congestion and infrastructure improvements (bus lanes etc), the scale of the patronage increase results in an increase in cost. This is (more than) balanced by the reduction in road user costs within the network from mode shift to the PT mode.

Also, there is little difference between the PT travel time cost between Arterial options – again this is to be expected as the introduction of the Arterial stage 2 and 3 options have a limited impact on bus travel times, compared to other measures in the rest of the network.

3.4 Reliability Improvement Benefits

EEM section A18.2 sets out a method for deriving reliability improvement benefits. Whilst it is expected that an improvement in reliability will be achieved by the NZUP scheme, benefits from this element have not been calculated for a number of reasons:

- Because the model runs represent the difference in both infrastructure provision and the consequential change in PT patronage (demand), the calculation of reliability benefits is difficult – as the number of passengers differs significantly between scenarios
- Model output was not collected on a per individual service basis – which would allow a spread of reliability (or lateness) to be calculated. Whilst this is possible, it would require re-runs of all local models
- As there is a significant change in service provision in each scenario (Do Min versus NZUP), the treatment of reliability also includes such impacts as a change in transfer requirement and/or location, for example. This results in a complex calculation of the reliability benefits on each particular O-D journey

Notwithstanding the above, we have undertaken a sensitivity test on reliability benefits, calculated based on the method shown in EEM A18.2, but based on the difference between minimum and maximum bus travel time in each scenario/year/time period, rather than minutes late – so is more related to variability of travel time than lateness. This analysis shows that the net reliability cost is very similar between the Do Minimum and NZUP scenarios at all years. That is, the reduction in trip travel time variability is balanced by the additional passengers that experience this variability – see Figure 3.

Year	PT Reliability (Cost)						
	Art1	Art1X	NZUP	NZUPX	Art12	Art12X	Art123X
2018	\$ 408,536	\$ 346,216	\$ 1,675,153	\$ 1,681,612	\$ 1,509,318	\$ 1,545,924	\$ 1,748,770
2028	\$ 9,298,664	\$ 7,749,815	\$ 9,508,295	\$ 8,691,506	\$ 8,775,763	\$ 8,689,794	\$ 8,159,549
2048	\$ 22,339,139	\$ 29,160,112	\$ 23,628,058	\$ 20,899,615	\$ 21,554,961	\$ 20,923,022	\$ 23,700,194

Figure 3: PT Reliability/Travel Time Variability Costs (\$/year)

Consequently, the reliability differences are minor compared to the overall travel time costs (in previous section), and therefore due to the complexities of providing a comprehensive analysis of reliability benefits, we have omitted this element from the economic analysis.

3.5 Increased Frequency Analysis

For the increased frequency analysis, the process set out in EEM Section A18.4 were followed:

- Calculate frequency benefit using:
 - Wait time benefit from EEM Table A18.2 for combined passenger type
 - Use VoT of \$7.93/h and update factor of 1.54

This analysis provides the following output shown in Figure 4.

Year	Increased Frequency (Benefit)						
	Art1	Art1X	NZUP	NZUPX	Art12	Art12X	Art123X
2018	\$ -	\$ -	\$ 209,750	\$ 209,750	\$ 209,750	\$ 209,750	\$ 209,750
2028	\$ -	\$ -	\$ 826,973	\$ 826,973	\$ 826,973	\$ 826,973	\$ 826,973
2048	\$ -	\$ -	\$ 1,633,737	\$ 1,633,737	\$ 1,633,737	\$ 1,633,737	\$ 1,633,737

Figure 4: PT Increased Service Frequency benefits (\$/year)

Benefits are relatively low compared to the changes in travel time cost – and are the same for all Arterial options as the same frequency (and patronage) is predicted in all scenarios.

3.6 Interchange, Infrastructure and Vehicle Benefits

Whilst EEM section A18.5 provides a calculation to calculate interchange reduction benefit, there is some uncertainty over the specific PT service patterns that would be provide under the NZUP package (over those provide in the Do Minimum) – although it is expected that frequencies would be improved (as per the analysis above), the impact on transfer/interchange requirements is less clear. Therefore, we have not calculated any interchange reduction benefits as part of the economic case.

Similarly, although PT vehicle upgrades would be expected, given the uncertainties over this element we have also ignored this benefit stream (as a robust approach).

However, the NZUP package does include an improvement in PT hub facilities at both Queenstown and Frankton. Therefore, we have calculated the benefit of these improvements based on:

- Number of forecast boarding, alighting and transferring passengers at each site per scenario, per year, per time period
- In vehicle time benefit from EEM Table A18.5 of **2.0 minutes** for Station – no other improvements have been monetised
- Use VoT of \$7.93/h and update factor of 1.54

This analysis provides the following output shown in Figure 5 for Queenstown Town Centre (Stanley Street) PT hub and Figure 6 for Frankton PT hub.

TOTAL BOARD/ALIGHT (p/h) - QTC HUB						
	2018	2018	2028	2028	2048	2048
	Base	Bus Max	Base	Bus Max	Base	Bus Max
AM	180	386	573	1114	1099	1677
IP	92	349	289	1045	792	1513
PM	185	378	786	1461	1486	2339
TOTAL INFRASTRUCTURE BENEFITS (\$) - QTC HUB						
	2018	2018	2028	2028	2048	2048
	Do Min	NZUP	Do Min	NZUP	Do Min	NZUP
AM	\$ -	\$ 67,432	\$ -	\$ 194,912	\$ -	\$ 293,266
IP	\$ -	\$ 314,053	\$ -	\$ 939,453	\$ -	\$ 1,360,799
PM	\$ -	\$ 71,590	\$ -	\$ 277,006	\$ -	\$ 443,427
Total	\$ -	\$ 453,075	\$ -	\$ 1,411,371	\$ -	\$ 2,097,492

Figure 5: Queenstown Town Centre PT Hub - Infrastructure Benefits (\$/year)

TOTAL BOARD/ALIGHT (p/h) - FRANKTON HUB						
	2018	2018	2028	2028	2048	2048
	Base	Bus Max	Base	Bus Max	Base	Bus Max
AM	65	96	190	252	324	339
IP	23	88	75	326	269	416
PM	57	100	240	365	374	533
TOTAL INFRASTRUCTURE BENEFITS (\$) - FRANKTON HUB						
	2018	2018	2028	2028	2048	2048
	Do Min	NZUP	Do Min	NZUP	Do Min	NZUP
AM	\$ -	\$ 16,770	\$ -	\$ 44,109	\$ -	\$ 59,349
IP	\$ -	\$ 78,871	\$ -	\$ 292,817	\$ -	\$ 374,282
PM	\$ -	\$ 18,908	\$ -	\$ 69,211	\$ -	\$ 101,081
Total	\$ -	\$ 114,549	\$ -	\$ 406,137	\$ -	\$ 534,712

Figure 6: Frankton PT Hub - Infrastructure Benefits (\$/year)

As would be expected, the benefits at the Queenstown hub are significant, given the higher passenger numbers (compared to Frankton hub).

3.7 Farebox Revenue

This is strictly not a PT benefit, it is better defined as a negative cost. Consequently, this is considered elsewhere within the economic evaluation for PT operations.

3.8 Unmet PT Demand

As the PT model is not capacity constrained, this leads to situations where passengers continue to use PT when the service is over-capacity. Whilst this is not an issue in the NZUP package where extra capacity is added to ensure the service level is reasonable, this is not the case in the Do Minimum.

The original strategy to deal with this issue in the PT economics was to monetise the extra wait times experienced by passengers unable to board services, as outlined in EEM section A18.7 – in this way, any passengers above the 100% load factor would be attributed an extra delay penalty based on the average wait time that they would incur related to the percentage overload.

However, an alternative method was determined that essentially characterised this lack of PT capacity in the Do Minimum as unmet demand, which can be monetised as a loss in international

visitor spending and/or loss in productivity for locals and domestic visitors. This is considered elsewhere as a Wider Economic Benefit.

The PT model therefore predicts the following excess trips on PT that cannot be accommodated – note values are zero at 2018 and 2028, it is only at 2048 that significant over-capacity operation is predicted on the SH6A section of the network.

SH6A	Without NZUP		
	AM	IP	PM
	196	93	600

Figure 7: Unmet demand on SH6A at 2048

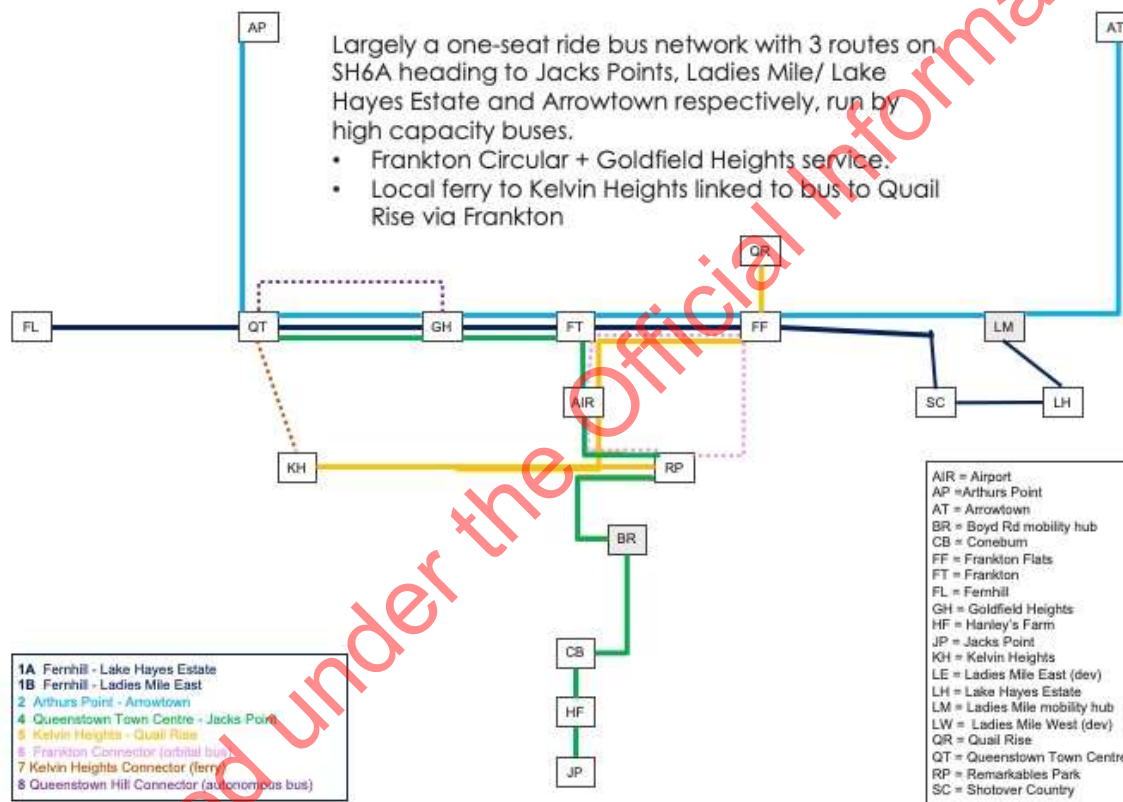
4 Summary

This technical note sets out the methodology for converting PT patronage from the model into an economic evaluation carried out for the Queenstown Town Centre, Frankton to Queenstown, and Frankton - Transport Business Case (the Business Case).

All the various PT benefit and cost calculations set out in the above sections have been combined with other cost and benefit streams to provide the economic case for the Business Case. Reporting on this compilation exercise is provided in the economic case document itself.

Appendix A – NZUP PT Network

Bus Max



Appendix B1 – Travel Time Output (in seconds) for 2018 scenarios

Link Number	From	To	In Model?	Link Number	Params	2018																							
						Art1			Art1X			NZUP			NZUPX			Art12			Art12X			Art123X					
						AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM			
1E	1-mile roundabout	QTC	Yes	1E	10011	462	490	431	434	783	566	466	479	485	447	507	486	486	479	467	504	492	473	462	458	441			
1W	QTC	1-mile roundabout	Yes	1W	10012	338	358	348	341	402	388	294	300	306	301	324	324	350	354	350	351	360	353	327	349	345			
2N	QTC	Gorge Industrial	Yes	2N	10021	230	329	275	238	256	256	235	243	244	229	219	225	228	239	240	240	237	234	228	237	232			
2S	Gorge Industrial	QTC	Yes	2S	10022	384	384	291	265	315	346	442	401	311	363	376	374	331	343	366	325	367	338	349	369	366			
3E	QTC	Frankton Hub	Yes	3E	10031	1054	1099	1141	1042	1128	1128	1164	1206	1273	1201	1273	1345	1204	1248	1291	1155	1252	1319	1161	1259	1317			
3W	Frankton Hub	QTC	Yes	3W	10032	905	1144	980	909	905	965	1228	1175	1207	1222	1176	1221	1209	1187	1228	1195	1168	1204	1187	1169	1204			
4N	Kawarau Falls	Frankton Hub	Yes	4N	10041	117	114	118	118	117	123	185	230	263	192	231	257	181	231	257	184	230	253	184	231	245			
4S	Frankton Hub	Kawarau Falls	Yes	4S	10042	107	109	105	107	109	107	113	100	98	114	99	98	117	102	100	111	97	97	123	95	102			
5N	Airport	Frankton Hub	Yes	5N	10051	117	114	118	118	117	123	185	230	263	192	231	257	181	231	257	184	230	253	184	231	245			
5S	Frankton Hub	Airport	Yes	5S	10052	107	109	105	107	109	107	113	100	98	114	99	98	117	102	100	111	97	97	123	95	102			
6N	Remarkables Park	Airport	Yes	6N	10061	135	142	118	131	135	119	128	136	122	125	133	122	121	133	120	127	126	122	126	135	119			
6S	Airport	Remarkables Park	Yes	6S	10062	103	108	105	103	107	105	103	104	104	103	104	104	103	104	105	103	104	104	103	104	105			
6W	Kawarau Falls	Remarkables Park	Yes	6W	10041	150	154	154	150	154	158	156	160	156	160	159	156	158	159	163	155	162	152	155	163	170			
6E	Remarkables Park	Kawarau Falls	Yes	6E	10042	190	195	192	187	191	195	250	248	253	246	282	242	246	247	242	247	255	237	245	250	248			
7E	Frankton Hub	Shotover Bridge	Yes	7E	10071	304	303	311	304	304	313	501	518	515	493	504	507	499	507	505	509	509	507	504	509	498			
7W	Shotover Bridge	Frankton Hub	Yes	7W	10072	220	219	220	220	219	220	447	440	447	446	438	442	446	437	444	447	436	442	447	439	441			
8N	Hawthorne Drive	Quail Rise	Yes	8N	10081	307	303	321	306	302	314	383	370	361	384	374	366	384	369	366	383	375	366	381	368	363			
8S	Quail Rise	Hawthorne Drive	Yes	8S	10082	260	258	260	261	259	257	271	270	272	270	268	272	272	268	269	275	268	273	272	269	274			
9E	Shotover Bridge	LHE	Yes	9E	1	252	241	242	252	241	242	240	236	239	240	236	239	240	236	239	240	236	239	240	236	239			
9W	LHE	Shotover Bridge	Yes	9W	302	559	230	230	559	230	230	241	234	235	241	234	235	241	234	235	241	234	235	241	234	235			
10E	Shotover Bridge	Ladies Mile P&R	Yes	10E	-	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140			
10W	Ladies Mile P&R	Shotover Bridge	Yes	10W	-	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200			
11E	Ladies Mile P&R	Alec Robins	Yes	11E	2	126	125	127	126	125	127	131	129	130	131	129	130	131	129	130	131	129	130	131	129	130			
11W	Alec Robins	Ladies Mile P&R	Yes	11W	502	282	71	70	282	71	70	89	80	85	89	80	85	89	80	85	89	80	85	89	80	85			
F1	Fernhill	1-mile roundabout	No	F1		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600			
F2	1-mile roundabout	Fernhill	No	F2		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600			
AP1	Arthurs Point	Gorge Industrial	No	AP1		360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360			
AP2	Gorge Industrial	Arthurs Point	No	AP2		360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360			
AT1	Arrowtown	Alec Robins	No	AT1		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600			
AT2	Alec Robins	Arrowtown	No	AT2		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600			
KH1	Kelvin Heights	Kawarau Falls	No	KH1		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720			
KH2	Kawarau Falls	Kelvin Heights	No	KH2		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720			
BR1	Boyd Road	Kawarau Falls	No	BR1		300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300			
BR2	Kawarau Falls	Boyd Road	No	BR2		300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300			
JP1	Jacks Point	Boyd Road	No	JP1		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720			
JP2	Boyd Road	Jacks Point	No	JP2		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720			

Appendix B2 – Travel Time Output (in seconds) for 2028 scenarios

Link Number	From	To	In Model?	Link Number	Params	2028																				
						Art1			Art1X			NZUP			NZUPX			Art12			Art12X			Art123X		
						AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM
1E	1-mile roundabout	QTC	Yes	1E	10011	419	561	427	418	946	511	461	468	480	439	489	454	490	447	461	477	489	488	461	443	446
1W	QTC	1-mile roundabout	Yes	1W	10012	320	325	329	351	381	343	283	300	294	308	335	310	330	355	340	352	355	363	346	358	326
2N	QTC	Gorge Industrial	Yes	2N	10021	245	347	272	238	240	264	234	260	229	229	221	232	230	240	237	232	244	231	244	234	222
2S	Gorge Industrial	QTC	Yes	2S	10022	743	726	273	318	559	322	442	731	300	358	377	376	325	338	327	331	356	340	332	362	344
3E	QTC	Frankton Hub	Yes	3E	10031	1104	1458	1233	1090	1364	1206	1199	1272	1218	1243	1338	1276	1231	1312	1246	1193	1351	1240	1204	1325	1235
3W	Frankton Hub	QTC	Yes	3W	10032	935	1165	1097	937	1044	1175	1207	1295	1284	1206	1322	1297	1198	1292	1290	1197	1230	1241	1176	1257	1269
4N	Kawarau Falls	Frankton Hub	Yes	4N	10041	122	132	193	124	129	198	193	230	280	199	231	293	192	230	295	192	230	295	192	230	295
4S	Frankton Hub	Kawarau Falls	Yes	4S	10042	109	110	115	112	111	108	116	97	110	118	99	102	117	102	108	117	102	108	117	102	108
5N	Airport	Frankton Hub	Yes	5N	10051	122	132	193	124	129	198	193	230	280	199	231	293	195	229	290	192	230	295	190	230	297
5S	Frankton Hub	Airport	Yes	5S	10052	109	110	115	112	111	108	116	97	110	118	99	102	116	104	101	117	102	108	113	95	99
6N	Remarkables Park	Airport	Yes	6N	10061	149	157	134	146	155	148	132	145	238	140	148	173	138	157	212	131	147	263	138	161	227
6S	Airport	Remarkables Park	Yes	6S	10062	109	120	112	112	117	110	105	104	120	105	105	119	105	105	130	105	105	127	104	105	114
6W	Kawarau Falls	Remarkables Park	Yes	6W	10041	155	164	166	155	158	164	181	184	283	177	180	202	181	174	214	181	174	214	181	174	214
6E	Remarkables Park	Kawarau Falls	Yes	6E	10042	188	209	230	192	195	269	247	288	284	260	289	335	255	311	486	255	311	486	255	311	486
7E	Frankton Hub	Shotover Bridge	Yes	7E	10071	514	528	538	520	520	547	514	528	538	520	520	547	511	524	541	513	533	548	520	524	542
7W	Shotover Bridge	Frankton Hub	Yes	7W	10072	444	455	444	442	441	441	444	455	444	442	441	441	444	445	442	442	477	444	448	442	444
8N	Hawthorne Drive	Quail Rise	Yes	8N	10081	308	305	352	307	307	354	422	379	387	473	398	343	406	405	339	418	386	368	380	418	356
8S	Quail Rise	Hawthorne Drive	Yes	8S	10082	263	259	261	266	261	260	272	295	277	274	282	275	276	273	276	273	296	273	273	283	276
9E	Shotover Bridge	LHE	Yes	9E	1	248	240	259	248	240	259	242	240	245	242	240	245	242	240	245	242	240	245	242	240	245
9W	LHE	Shotover Bridge	Yes	9W	302	507	236	238	507	236	238	272	233	234	272	233	234	272	233	234	272	233	234	272	233	234
10E	Shotover Bridge	Ladies Mile P&R	Yes	10E	-	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
10W	Ladies Mile P&R	Shotover Bridge	Yes	10W	-	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
11E	Ladies Mile P&R	Alec Robins	Yes	11E	2	138	132	153	138	132	153	139	136	140	139	136	140	139	136	140	139	136	140	139	136	140
11W	Alec Robins	Ladies Mile P&R	Yes	11W	502	1951	84	93	1951	84	93	727	84	92	727	84	92	727	84	92	727	84	92	727	84	92
F1	Fernhill	1-mile roundabout	No	F1		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
F2	1-mile roundabout	Fernhill	No	F2		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
AP1	Arthurs Point	Gorge Industrial	No	AP1		360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
AP2	Gorge Industrial	Arthurs Point	No	AP2		360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
AT1	Arrowtown	Alec Robins	No	AT1		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
AT2	Alec Robins	Arrowtown	No	AT2		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
KH1	Kelvin Heights	Kawarau Falls	No	KH1		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
KH2	Kawarau Falls	Kelvin Heights	No	KH2		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
BR1	Boyd Road	Kawarau Falls	No	BR1		300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
BR2	Kawarau Falls	Boyd Road	No	BR2		300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
JP1	Jacks Point	Boyd Road	No	JP1		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
JP2	Boyd Road	Jacks Point	No	JP2		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720

Appendix B3 – Travel Time Output (in seconds) for 2048 scenarios

Link Number	From	To	In Model?	Link Number	Params	2048																				
						Art1			Art1X			NZUP			NZUPX			Art12			Art12X			Art123X		
						AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM
1E	1-mile roundabout	QTC	Yes	1E	10011	424	587	440	418	972	651	466	494	494	438	515	583	496	465	510	493	446	499	460	434	464
1W	QTC	1-mile roundabout	Yes	1W	10012	323	320	329	344	376	384	286	296	294	301	331	350	330	356	358	349	357	365	337	351	369
2N	QTC	Gorge Industrial	Yes	2N	10021	266	351	290	231	244	260	256	264	247	222	225	228	235	250	244	226	240	230	224	243	245
2S	Gorge Industrial	QTC	Yes	2S	10022	924	902	295	336	736	329	622	908	322	376	554	382	305	422	411	320	392	324	368	378	353
3E	QTC	Frankton Hub	Yes	3E	10031	1101	1559	2003	1082	1465	1825	1196	1373	1988	1236	1439	1896	1251	1379	2177	1179	1495	1997	1193	1568	2118
3W	Frankton Hub	QTC	Yes	3W	10032	963	1214	1058	963	1093	1154	1235	1344	1245	1282	1371	1276	1228	1311	1270	1223	1330	1259	1219	1323	1267
4N	Kawarau Falls	Frankton Hub	Yes	4N	10041	131	263	313	144	261	271	201	362	401	219	363	366	204	323	554	217	343	342	211	360	461
4S	Frankton Hub	Kawarau Falls	Yes	4S	10042	110	113	239	104	114	231	117	100	235	111	102	224	123	96	310	118	104	198	117	99	322
5N	Airport	Frankton Hub	Yes	5N	10051	131	263	313	144	261	271	201	362	401	219	363	366	204	323	554	217	343	342	211	360	461
5S	Frankton Hub	Airport	Yes	5S	10052	110	113	239	104	114	231	117	100	235	111	102	224	123	96	310	118	104	198	117	99	322
6N	Remarkables Park	Airport	Yes	6N	10061	198	975	371	168	973	283	182	963	475	162	966	309	167	802	409	219	865	419	165	818	400
6S	Airport	Remarkables Park	Yes	6S	10062	114	231	311	115	228	232	110	215	320	109	215	242	107	207	286	119	205	226	108	237	617
6W	Kawarau Falls	Remarkables Park	Yes	6W	10041	228	1135	500	250	1129	698	254	1155	617	272	1151	736	254	866	584	254	866	584	301	786	660
6E	Remarkables Park	Kawarau Falls	Yes	6E	10042	290	1213	453	186	1198	596	349	1291	507	254	1292	662	269	861	967	269	861	967	302	1123	943
7E	Frankton Hub	Shotover Bridge	Yes	7E	10071	538	549	529	535	540	549	538	549	529	535	540	549	546	554	559	533	554	543	549	557	533
7W	Shotover Bridge	Frankton Hub	Yes	7W	10072	437	437	808	437	423	725	437	437	808	437	423	725	447	436	762	446	437	779	447	439	910
8N	Hawthorne Drive	Quail Rise	Yes	8N	10081	369	390	353	332	392	358	483	464	387	498	483	348	477	495	357	465	439	385	514	437	385
8S	Quail Rise	Hawthorne Drive	Yes	8S	10082	263	233	485	266	235	386	273	269	502	274	256	401	278	273	391	278	271	407	275	274	380
9E	Shotover Bridge	LHE	Yes	9E	1	257	250	263	257	250	263	251	248	261	251	248	261	251	248	261	251	248	261	251	248	261
9W	LHE	Shotover Bridge	Yes	9W	302	465	238	254	465	238	254	265	235	234	265	235	234	265	235	234	265	235	234	265	235	234
10E	Shotover Bridge	Ladies Mile P&R	Yes	10E	-	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
10W	Ladies Mile P&R	Shotover Bridge	Yes	10W	-	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
11E	Ladies Mile P&R	Alec Robins	Yes	11E	2	144	139	166	144	139	166	141	141	163	141	141	163	141	141	163	141	141	163	141	141	163
11W	Alec Robins	Ladies Mile P&R	Yes	11W	502	1661	94	152	1661	94	152	965	114	642	965	114	642	965	114	642	965	114	642	965	114	642
F1	Fernhill	1-mile roundabout	No	F1		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
F2	1-mile roundabout	Fernhill	No	F2		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
AP1	Arthurs Point	Gorge Industrial	No	AP1		360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
AP2	Gorge Industrial	Arthurs Point	No	AP2		360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
AT1	Arrowtown	Alec Robins	No	AT1		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
AT2	Alec Robins	Arrowtown	No	AT2		600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
KH1	Kelvin Heights	Kawarau Falls	No	KH1		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
KH2	Kawarau Falls	Kelvin Heights	No	KH2		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
BR1	Boyd Road	Kawarau Falls	No	BR1		300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
BR2	Kawarau Falls	Boyd Road	No	BR2		300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
JP1	Jacks Point	Boyd Road	No	JP1		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
JP2	Boyd Road	Jacks Point	No	JP2		720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720



Appendix C – Example O-D PT Patronage (2028 NZUP)

2028 AM NZUP		F	1	Q	2	AP	3	H	7	8	9	LM	11	AT	5	A	61	RP	62	4	KH	BR	JP
	F	4.54	23.94	133.54	16.35	0.94	1.60	0.93	1.29	0.01	0.14	0.00	0.02	0.20	0.03	0.74	0.35	1.60	0.09	0.14	0.16	0.00	0.12
	1	2.49	23.21	104.04	32.37	2.95	2.65	1.57	2.91	0.03	0.58	0.00	0.68	1.25	0.05	1.71	0.51	3.65	0.25	0.37	0.77	0.00	0.56
	Q	9.68	86.48	458.20	116.59	12.06	13.81	7.11	12.87	0.14	2.78	0.00	0.24	5.74	0.23	6.80	2.13	14.71	1.04	1.59	3.41	0.42	2.74
	2	1.66	29.07	151.15	19.98	2.44	2.88	1.05	1.89	0.02	0.41	0.00	0.04	1.00	0.03	0.88	0.27	1.98	0.16	0.23	0.56	0.03	0.38
	AP	0.58	11.38	75.39	20.22	1.24	1.15	0.46	1.03	0.01	0.33	0.00	0.05	0.95	0.01	0.32	0.11	0.87	0.06	0.08	0.20	0.00	0.09
	3	0.89	12.53	110.39	14.95	0.99	3.23	3.37	4.12	0.06	0.65	0.00	0.07	1.11	0.14	2.38	1.17	3.51	0.33	0.55	0.81	0.00	1.03
	H	0.32	3.94	29.78	4.56	0.34	1.75	1.76	3.50	0.05	0.85	0.00	0.07	0.94	0.06	1.74	0.50	3.09	0.32	0.43	0.83	0.19	1.44
	7	0.22	3.91	27.07	4.82	0.34	1.32	1.92	4.75	0.10	1.24	0.00	0.12	1.19	0.06	1.11	0.66	4.72	0.48	0.39	0.92	0.65	1.30
	8	0.01	0.22	2.28	0.15	0.02	0.09	0.15	0.41	0.00	0.03	0.00	0.00	0.05	0.01	0.08	0.07	0.35	0.04	0.02	0.06	0.08	0.05
	9	0.24	5.92	60.05	4.23	0.67	1.53	3.18	7.56	0.07	4.69	0.00	0.62	3.57	0.09	1.69	1.70	4.81	0.46	0.35	0.41	0.07	0.33
	LM	0.00	9.36	51.85	18.64	0.00	0.16	1.34	4.41	0.17	0.00	0.00	0.00	0.00	0.00	1.01	0.41	8.03	0.20	0.00	0.00	0.00	0.00
	11	0.01	0.68	6.13	0.61	0.05	0.09	0.29	0.94	0.00	0.30	0.00	0.01	0.18	0.00	0.25	0.21	0.76	0.07	0.02	0.02	0.00	0.02
	AT	0.19	8.87	64.99	13.03	1.40	1.42	3.01	9.79	0.06	3.65	0.00	0.40	16.39	0.06	2.06	1.34	6.88	0.56	0.30	0.71	0.00	0.34
	5	0.03	0.35	3.32	0.28	0.02	0.16	0.23	0.35	0.00	0.05	0.00	0.00	0.05	0.00	0.22	0.06	0.27	0.03	0.04	0.08	0.00	0.12
	A	0.14	4.10	19.74	4.96	0.20	0.72	0.74	1.37	0.03	0.26	0.00	0.02	0.42	0.02	0.27	0.26	2.11	0.23	0.19	0.44	0.88	0.99
	61	0.06	0.69	5.03	0.62	0.05	0.30	0.36	0.79	0.01	0.23	0.00	0.02	0.16	0.01	0.34	0.03	0.84	0.11	0.10	0.22	0.00	0.27
	RP	0.05	0.91	7.67	0.94	0.07	0.27	0.45	1.42	0.03	0.73	0.00	0.08	0.19	0.01	0.54	0.26	1.91	0.24	0.10	0.31	0.26	0.76
	62	0.08	1.34	11.27	1.18	0.09	0.41	0.69	1.82	0.03	0.20	0.00	0.02	0.21	0.02	0.82	0.42	3.03	0.18	0.15	0.44	0.05	0.43
	4	0.06	0.93	7.19	1.04	0.06	0.33	0.42	0.71	0.01	0.10	0.00	0.01	0.14	0.01	0.35	0.18	0.68	0.07	0.03	0.16	0.00	0.20
	KH	0.20	4.15	36.89	5.68	0.27	1.83	3.46	5.96	0.11	0.27	0.00	0.03	0.90	0.11	3.16	1.80	8.33	0.85	0.54	5.62	0.00	1.39
	BR	0.00	2.85	21.51	1.78	0.00	0.12	0.20	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.26	0.72	0.07	0.00	0.00	0.00	0.00
	JP	0.23	6.86	63.16	6.68	0.27	2.13	5.90	7.25	0.06	0.22	0.00	0.03	0.53	0.15	6.01	2.43	10.27	0.98	0.71	1.25	0.00	0.00
																							1869



2028 IP NZUP		F	1.00	Q	2.00	AP	3.00	H	7.00	8.00	9.00	LM	11.00	AT	5.00	A	61.00	RP	62.00	4.00	KH	BR	JP
	F	1.67	9.21	37.80	5.15	0.34	0.69	0.33	0.31	0.01	0.07	0.00	0.00	0.12	0.02	0.49	0.20	0.78	0.06	0.12	0.12	0.00	0.09
	1	6.60	42.93	170.20	32.54	4.09	6.54	2.92	3.37	0.07	1.91	2.70	0.55	3.01	0.15	3.80	1.28	7.15	0.73	1.16	1.65	2.01	2.85
	Q	47.64	172.14	730.33	140.22	32.87	50.87	25.24	30.06	0.81	20.06	24.21	2.48	32.48	1.41	31.81	8.30	61.95	6.24	9.20	15.37	17.94	28.68
	2	7.45	36.36	148.15	20.58	5.00	6.64	3.12	4.05	0.09	2.32	3.20	0.30	3.60	0.16	4.09	0.84	8.47	0.79	1.19	1.89	2.21	3.46
	AP	0.41	6.44	30.19	5.56	0.91	0.68	0.28	0.49	0.01	0.29	0.00	0.03	0.62	0.01	0.45	0.06	0.97	0.07	0.11	0.13	0.00	0.09
	3	0.93	7.53	48.78	6.75	0.66	2.15	1.90	1.71	0.04	0.48	0.09	0.04	0.91	0.09	1.90	0.65	3.51	0.33	0.62	0.93	0.09	1.07
	H	0.51	4.41	26.68	3.24	0.38	2.74	2.14	2.93	0.09	1.45	0.35	0.16	2.24	0.09	2.65	0.46	6.20	0.65	0.87	2.23	0.23	3.72
	7	0.43	5.59	32.13	3.95	0.53	2.55	3.57	8.17	0.18	3.66	1.55	0.56	5.81	0.14	2.42	1.44	13.71	1.13	1.17	2.96	0.64	4.53
	8	0.00	0.09	0.73	0.05	0.01	0.05	0.09	0.13	0.00	0.01	0.00	0.00	0.02	0.00	0.03	0.06	0.36	0.03	0.02	0.05	0.00	0.04
	9	0.08	2.07	17.00	1.24	0.20	0.55	1.33	2.76	0.02	1.02	0.00	0.12	0.90	0.03	0.43	1.04	2.95	0.26	0.26	0.13	0.00	0.12
	LM	0.00	3.60	19.77	1.85	0.00	0.67	0.44	1.39	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.36	2.47	0.19	0.00	0.00	0.00	0.00
	11	0.00	0.55	2.39	0.25	0.02	0.04	0.15	0.41	0.00	0.11	0.00	0.00	0.07	0.00	0.07	0.21	1.04	0.08	0.02	0.01	0.00	0.01
	AT	0.11	4.46	26.16	3.75	0.67	0.76	1.69	4.22	0.03	1.24	0.00	0.11	9.79	0.03	0.96	1.09	9.50	0.63	0.28	0.35	0.00	0.21
	5	0.02	0.19	1.14	0.11	0.01	0.07	0.08	0.13	0.00	0.03	0.00	0.00	0.04	0.00	0.11	0.02	0.15	0.02	0.03	0.05	0.00	0.07
	A	0.29	4.93	22.77	3.61	0.23	1.69	2.14	1.28	0.04	0.43	0.80	0.07	1.09	0.07	0.33	0.48	3.52	0.43	0.47	1.40	0.22	1.71
	61	0.32	1.73	7.99	0.94	0.10	0.68	0.45	0.88	0.05	0.85	0.24	0.10	0.95	0.02	0.37	0.04	1.27	0.18	0.20	0.81	0.23	0.96
	RP	0.61	8.44	45.38	6.20	0.64	3.02	4.77	9.61	0.24	1.60	1.47	0.38	5.17	0.10	4.08	1.54	3.15	2.19	1.25	3.97	1.05	5.23
	62	0.05	0.69	4.35	0.42	0.04	0.25	0.44	0.71	0.02	0.13	0.10	0.03	0.33	0.01	0.41	0.19	1.95	0.09	0.11	0.31	0.13	0.41
	4	0.10	1.01	5.67	0.58	0.06	0.46	0.42	0.50	0.01	0.21	0.00	0.01	0.21	0.01	0.30	0.18	0.85	0.08	0.03	0.29	0.00	0.16
	KH	0.07	1.76	12.38	1.46	0.08	0.77	1.27	1.53	0.04	0.05	0.00	0.01	0.34	0.03	1.21	0.80	3.47	0.30	0.30	1.66	0.00	0.28
	BR	0.00	1.27	8.26	0.92	0.00	0.08	0.08	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.17	0.49	0.07	0.00	0.00	0.00	0.00
	JP	0.08	2.75	20.21	1.79	0.08	0.99	1.96	1.97	0.02	0.05	0.00	0.00	0.19	0.04	1.83	1.27	3.64	0.34	0.29	0.39	0.00	0.00
																							1992



2028 PM NZUP																							
	F	1.00	Q	2.00	AP	3.00	H	7.00	8.00	9.00	LM	11.00	AT	5.00	A	61.00	RP	62.00	4.00	KH	BR	JP	
	F	4.05	5.37	19.85	3.28	0.61	1.24	0.37	0.79	0.02	0.56	0.00	0.03	0.22	0.03	0.34	0.27	1.69	0.11	0.11	0.30	0.00	0.18
	1	30.06	44.40	154.15	34.81	11.97	17.57	4.54	8.82	0.36	10.91	6.25	1.13	9.99	0.48	5.45	1.83	15.83	1.89	1.67	5.10	3.83	8.86
	Q	132.23	174.58	693.02	160.98	66.25	123.32	30.39	51.33	3.04	85.46	39.29	7.21	66.00	3.59	24.95	9.62	88.02	13.22	10.80	38.80	30.08	70.19
	2	17.46	40.85	144.20	21.65	11.61	15.49	3.34	6.73	0.28	9.08	3.70	0.93	8.12	0.30	3.35	0.84	11.06	1.48	1.09	5.38	2.54	6.35
	AP	1.13	4.19	15.99	3.00	1.18	1.19	0.27	1.21	0.04	2.76	0.00	0.22	1.03	0.02	0.34	0.09	1.40	0.14	0.09	0.41	0.00	0.17
	3	1.79	4.04	23.69	4.13	1.10	4.21	2.40	4.09	0.13	3.45	0.23	0.21	1.56	0.20	1.59	0.66	5.27	0.62	0.71	2.17	0.20	2.29
	H	0.91	2.04	11.79	1.75	0.52	4.70	2.38	5.82	0.25	15.75	0.76	1.07	7.07	0.21	1.84	0.47	7.31	1.09	0.91	4.18	0.39	7.09
	7	0.87	2.54	13.59	1.71	0.79	4.25	4.54	9.65	0.37	23.56	6.93	2.42	16.80	0.40	2.86	2.02	20.05	1.87	1.54	6.84	1.47	13.05
	8	0.01	0.04	0.33	0.03	0.01	0.09	0.11	0.23	0.00	0.07	0.00	0.00	0.04	0.01	0.03	0.10	0.54	0.07	0.03	0.16	0.00	0.09
	9	0.17	1.22	8.65	0.88	0.33	0.94	1.57	2.75	0.03	3.23	0.00	0.30	1.50	0.06	0.39	1.55	4.95	0.45	0.30	0.45	0.00	0.27
	LM	0.00	6.49	28.65	2.23	0.00	1.75	0.66	4.21	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.69	16.64	0.31	0.00	0.00	0.00	0.00
	11	0.01	1.13	1.36	0.18	0.03	0.06	0.20	0.48	0.00	0.42	0.00	0.01	0.12	0.00	0.08	0.30	1.67	0.16	0.02	0.03	0.00	0.03
	AT	0.23	3.31	18.05	2.26	0.78	1.54	1.96	6.03	0.07	8.78	0.00	0.58	15.89	0.07	0.92	1.55	13.59	1.21	0.30	1.08	0.00	0.41
	5	0.03	0.08	0.48	0.07	0.01	0.14	0.09	0.20	0.01	0.41	0.00	0.02	0.14	0.00	0.07	0.02	0.23	0.04	0.03	0.13	0.00	0.16
	A	0.57	1.46	8.37	0.73	0.18	4.34	4.49	2.41	0.10	2.38	0.30	0.22	1.56	0.42	0.44	0.73	5.45	1.02	1.07	5.48	0.50	4.71
	61	0.60	1.13	5.91	0.80	0.12	2.34	0.65	1.46	0.11	5.22	0.42	0.41	2.37	0.06	0.39	0.04	2.38	0.50	0.45	3.36	0.62	3.89
	RP	0.18	0.51	2.88	0.33	0.05	0.79	0.91	0.92	0.04	4.63	14.48	1.21	8.07	0.06	0.28	0.19	1.92	0.38	0.20	1.58	2.50	14.31
	62	0.10	0.36	2.04	0.26	0.06	0.48	0.71	1.44	0.07	0.77	0.16	0.10	0.73	0.03	0.44	0.22	3.07	0.20	0.16	0.84	0.30	1.26
	4	0.15	0.45	2.46	0.30	0.07	0.72	0.60	1.22	0.04	2.46	0.00	0.13	0.74	0.04	0.33	0.30	1.39	0.18	0.05	0.56	0.00	0.21
	KH	0.15	0.98	5.82	0.73	0.11	1.35	1.43	2.95	0.12	0.72	0.00	0.04	0.52	0.08	0.96	1.04	5.06	0.59	0.30	4.56	0.00	0.41
	BR	0.00	1.88	13.65	1.72	0.00	0.09	0.31	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.65	1.63	0.14	0.00	0.00	0.00	0.00
	JP	0.17	2.01	12.43	1.37	0.12	1.93	2.57	3.73	0.08	0.57	0.00	0.04	0.39	0.12	1.62	1.87	6.56	0.77	0.36	1.35	0.00	0.00
																							2599

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NZTA Contract 2018235 - F2Q SSBC & QTC DBC

Technical Note # 30

13 July 2020

High Capacity Public Transport for Queenstown

1. PURPOSE OF PAPER

The purpose of this paper is to outline recent developments with public transport in Queenstown; current challenges and how the network would need to grow to meet projected future demand, and the potential for various forms of High Capacity Public Transport (HCPT) to meet this demand.

Note that this HCPT work is being undertaken to Indicative Business Case (IBC) level, and that operational aspects have only been taken to this level e.g. high-level operational costs. A Public Transport Services Operation Detailed Business Case (DBC) would be required to operationalise the service concept presented below and address the more detailed customer and operational challenges facing the current network.

2. CURRENT SITUATION

2.1 Patronage and Mode Shift

In November 2017, a new bus network was implemented in Queenstown, building on the previous Connectabus network, but with a much simpler network; expansion of frequent service to weekends on SH6A and to Fernhill; and very significant fare reductions with the implementation of \$2 fares on the GoCard, including a free transfer. A strong patronage response ensued and patronage in normal circumstances tripled from around ≈500,000 per annum to ≈1,500,000. Even though Covid-19 has had severe impacts on economic activity in Queenstown, patronage has already returned to around 60% of pre-Covid levels.

2.2 Fleet Size (bus and ferry) – current issues

The current fleet size is around 22 peak buses and 1 water taxi is currently required to provide the current service on Lake Wakatipu. As is typical for New Zealand urban areas, the buses have a wide front door (for wheelchair access); but narrow aisles, a 2x2 seating configuration; narrow rear doors and no or very limited provision for luggage. Each bus has a bike rack that can accommodate two bikes. However, demand for the bike racks sometimes exceeds demand, requiring people with bikes to wait for a subsequent service.

There are no significant issues with customers not being picked up, except around school finish times. Prior to the launch of the Lake Hayes Direct service, there were complaints of customers not being picked up at the Frankton Hub, but it is believed that the additional capacity has resolved this issue.

Key network coverage issues are requests from Arrowtown customers for a service to Queenstown Town Centre via Malaghans Road, avoiding chronic traffic congestion on SH6 East and SH6A. While bus stops were provided on Hawthorne Drive during its construction, there are currently no buses running on Hawthorne Drive between Remarkables Park and State Highway 6 East.

The ferries are water taxi style and are able to accommodate up to 30 passengers, most but not all of this inside. There are instances when these services struggle to meet demand, particularly on the final evening trips.

2.3 Customer Facing – current issues

While patronage has significantly increased, the current Queenstown network is not without its challenges:

Unreliability: High levels of traffic congestion which are variable by time of day; time of year; along with other impacts caused by crashes; road works; special events make it very challenging to run buses reliably.

There is limited bus and passenger capacity and customer amenity at the temporary **Queenstown Town Centre hub** on Stanley Street, presenting a less than optimal image for public transport.

There are severe conflicts at the **Frankton Hub** between urban services; Milford Sound buses; regional and long-distance buses; taxis, Ubers and general drop-offs. This, combined with low levels of customer amenity and operations split across both sides of SH6 South, makes this location a far from satisfactory bus hub.



Figure 1 Frankton Hub operational challenges April 2019

Numerous conflicts occur between urban services and ski, tour and Milford buses at key bus stops on SH6A (e.g. Millennium, Pounamu) where non-urban services have lengthy dwell times at peak periods. This means that urban buses can struggle to serve customers at these stops/ times.

There are **significant gaps in bus stop coverage**, especially on Frankton Flats. For example, there are no bus stops on SH6 East between the Frankton Hub and Hardware Lane.

There are significant pedestrian safety issues for customers crossing SH6A and SH6 East. While there are three pedestrian/cycle signalised crossings on SH6 South, there are no dedicated pedestrian crossing facilities, apart from median pedestrian refuges, on SH6A and SH6 East.

Significant trip and fall hazards for customers accessing, boarding and alighting buses in winter due to ice.

Bus stops generally provide shelter, but some are very exposed to wind and cold.

Sometimes, bike rack capacity is insufficient to meet demand, requiring a wait for a subsequent service.

Real time information was available from Trackabus pre-Covid and will be available again once the new electronic ticketing system goes live. However, there is no real time information at stops and hubs and limited customer awareness of the availability of Trackabus.

At Queenstown Airport, there is limited and poor presentation of bus information and across the **broader network** timetables require customers to already understand the network to be able to use it.

2.4 Service Improvements within the Current Fleet/Contract

In response to customer feedback during project engagement sessions in April 2020, the Otago Regional Council (ORC) has implemented a number of service improvements thus far in 2020.

- A Lake Hayes Direct service to Queenstown Town Centre, over an extended peak period, in January 2020.
- This Lake Hayes direct service has now been expanded to the whole span of service*.
- Extension of the Fernhill service to Sunshine Bay at all times*.

- Proposed elimination of the \$10 airport fare and reduction in all cash fares from \$5 to \$4*.

The * starred items are interim service changes that are yet to be finalised or trialled.

2.5 NZUP Programme

The \$90 million NZ Upgrade Programme for Queenstown includes significant infrastructure upgrades to support the Orbus bus network in Queenstown. Scope elements include a range of public transport projects on SH6 and SH6A, between Ladies Mile, Kawarau Falls Bridge and Queenstown town centre. Bus lanes will be built to prioritise travel by public transport on SH6 and bus priority on SH6A. These bus priority investments will be supported by a new bus hub on SH6 at Frankton.



Figure 2 NZ Upgrade Programme Queenstown Projects

These public transport infrastructure items would need to be supported by enhanced bus services that would use this infrastructure. But the bus service elements (services, fleet, depot and other supporting infrastructure) are not part of the NZUP programme itself. So while NZUP will provide significant travel time savings to bus customers and a much higher quality of customer amenity at the Frankton Hub, it will also generate a significant uplift in public transport demand which the current fleet would be strained to serve. It would make sense for public transport service improvements to go hand in hand with public transport infrastructure improvements.

2.6 Current Public Transport Limitations

The current Queenstown public transport contract expires in 2027. Services were contracted in 2017 to Ritchies with the reasonable expectation of seeing out the contract term who will have purchased and financed buses on this expectation. While there will be a bump in demand caused by organic growth as economic activity resumes in Queenstown with a further bump expected when the NZUP programme is complete in 2024, there is a variation mechanism in the current contract that would enable improved services to be provided. There are challenges around fleet, but for example, Wellington is acquiring significantly more electric buses which will free up some of its current diesel bus fleet. In spite of good pay by industry standards pay, sourcing and retaining bus drivers is a challenge, also experienced by many other New Zealand cities. A New Zealand-wide solution of an industry fair pay agreement or regional solutions of living wages for bus drivers would help with this, noting that tourism being a relatively low-wage sector with many earning close to the minimum wage in a high living cost community makes this part of a much broader issue for Queenstown and other tourism-focused economies.

A new public transport contract from 2027 provides the opportunity to deliver a “fit for Queenstown” solution that recognises the particular characteristics of a market where public transport needs to work equally well for commuters; visitors and a large itinerant workforce.

For ferries, a limited water taxi service operates on Lake Wakatipu between Queenstown Town Centre, Bayview, Frankton Marina and Kawarau Falls Village (the Hilton). The current operator has been pitching for public funding support and after completion of a Ferry DBC, ORC had agreed in principle to funding a basic level of ferry service. In addition, a further operator, KJet, has consent for a ferry operation, including on the Kawarau River, but has not approached ORC as yet regarding any public funding support.

3. FUTURE SITUATION – FORECAST PATRONAGE AND MODE SHIFT

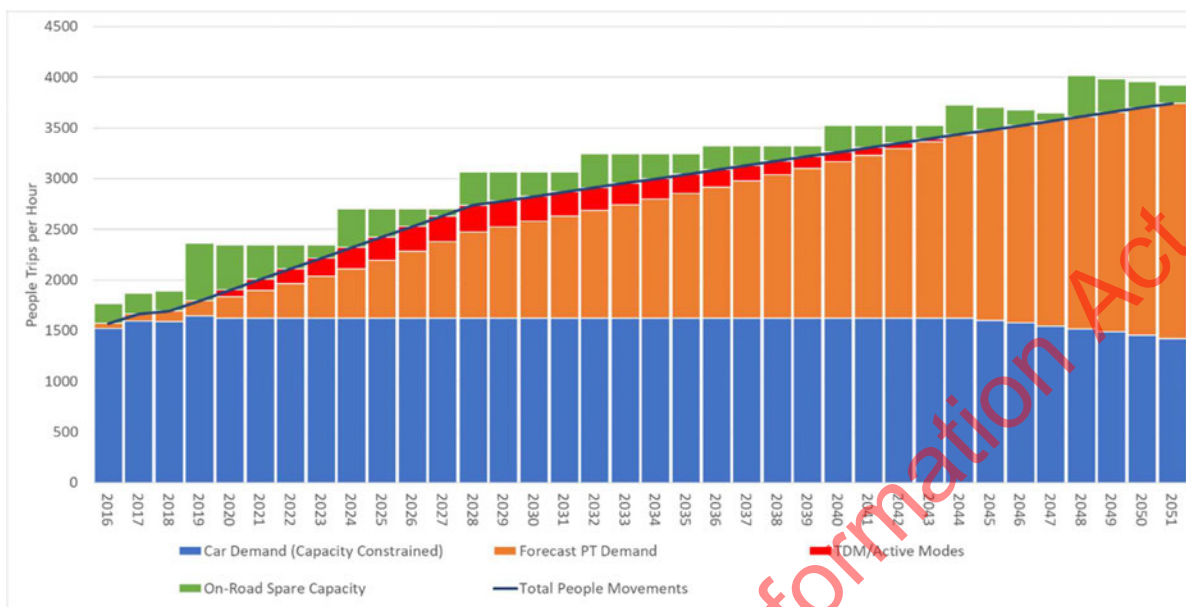


Figure 3 Forecast Patronage and Mode Shift

Figure 3 provides a simplistic overview of the growing transport demand along the SH6A corridor between Frankton and Queenstown. It is intended to illustrate when increases in service provision may be required to accommodate the growing patronage. In the figure above, blue represents car mode share and demonstrates that growth in vehicle demand is constrained by the capacity of the corridor; orange represents public transport demand; red represents the share of demand picked up by TDM and active modes and green represents capacity with double-decker or articulated buses up to 2039 and with bi-articulated buses or trackless trams thereafter. Note that the apparent drop in total demand post 2039 is due to the reduction in car volumes after this point.

The mode shift numbers are modelled outputs based on a typical generalised cost model with the price and availability of parking in Queenstown Town Centre being a significant lever to mode change.

It is important to note that this very significant mode shift is needed to keep all networks operating at an acceptable level. Put simply, if this mode shift does not occur, all networks will fail with car congestion at such extreme levels that makes even extensive public transport priority useless, creating a vicious circle incentivising further car use and ultimately constraining the economic growth of the region.

This is a level of mode shift never before attempted in New Zealand but as noted before it is the level of mode shift needed to keep all networks functioning at an acceptable level.

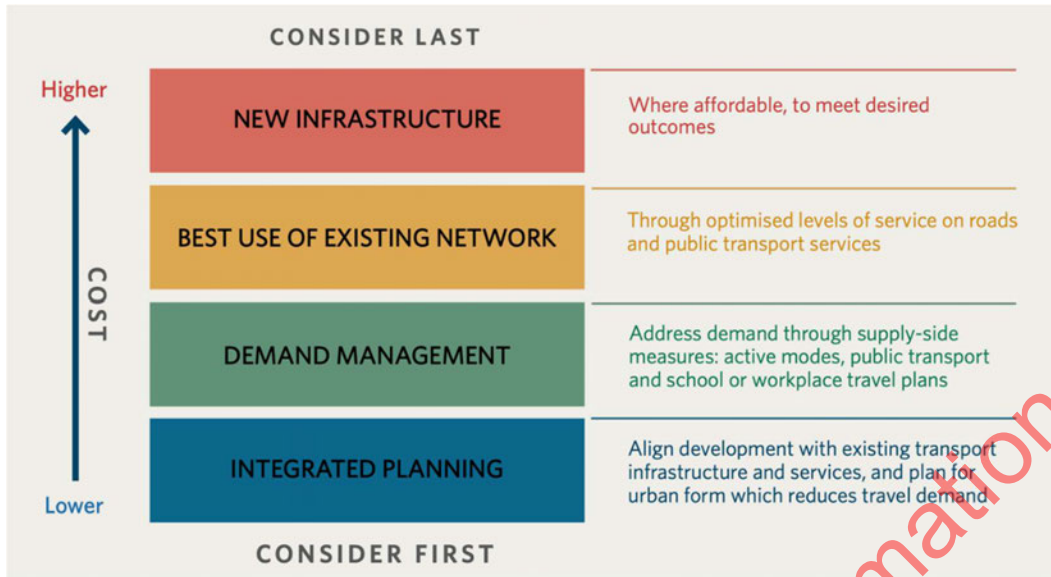


Figure 1 Waka Kotahi Intervention Hierarchy

As per the Waka Kotahi Intervention Hierarchy pictured above, this mode shift needs to occur through a combination of good **integrated planning** (e.g. with the Ladies Mile Masterplan and in the Southern growth area); **Travel demand management** where organisations like QLDC need to lead by example; **Best Use of Existing Network** in the form of staged upgrades of the existing Orbus network through to 2027, plus **New Infrastructure** in the form of the NZUP programme of infrastructure investments supported by a vastly enhanced "frequent to midnight" public transport network with six times the current network capacity; expansions and upgrades to the already extensive Queenstown Trails network and increased disposition to work from home where this is an option.

To achieve this level of mode shift requires all four pillars of the Intervention Hierarchy to work seamlessly together. Put simply, one pillar (for example, New Infrastructure) cannot do it on its own and if any one pillar fails, then that puts the whole programme at risk.

While this is undoubtedly a daunting challenge, Queenstown's sister city of Aspen, Colorado has over time achieved a similar level of mode shift.



QUEENSTOWN – BALANCING PLACE & MOVEMENT – A ROLE FOR TOD?

Stantec

Figure 2 Aspen Case Study

Aspen has many features in common with Queenstown: It has very expensive real estate and significant housing affordability challenges, resulting in many workers needing to commute long distances to jobs in Aspen. As a year-round resort destination, it has the same "insatiable desirability" that literally drives its transport issues. Growth in air services has in both cases been a key driver of visitor and population growth. And it has even similarly constrained access as Queenstown with one route in and out of the town centre.

It addressed its issues through:

Integrated Planning: The City of Aspen became a major workforce housing provider in its own right with a significant proportion of residents living in city-owned housing. The planned workforce housing development on the old Wakatipu High School site in Gorge Road is a good Queenstown analogy.

Travel Demand Management: All development applications in Aspen that generate significant trips are required to implement both extensive travel demand management measures and significant improvements to non-car modes of transport to mitigate their impact on the transport network.

Best Use of Existing Network is achieved through making the local public transit system free; extending its coverage and service span and integrating ski transport with the conventional public transport system.

New Infrastructure took the form of VelociRTA, touted as the first Rural BRT system, designed to provide a fast, frequent and attractive alternative to driving for the significant proportion of workers who lived outside of the core of Aspen. This was achieved through frequent service; high-quality, high-capacity buses; upgraded stops and stations and bus priority measures.

The net result of the combination of the above measures is that Aspen, one of the most affluent communities in the entire United States, achieves a 67.8% non-car driver mode share for commuting, which is higher than the 60% mode shift target called for in this business case process.

4. FERRY

Ferry has an important role to play especially to Kelvin Peninsula due to very significant travel time savings over road-based travel, noting that ferries often appeal to higher-income coastal communities. Challenges for ferry as mass transit are high vessel and operating costs; high crewing requirements (e.g. Maritime NZ requires 5 crew for a 200-seat ferry); and limited capacity and frequency. In Auckland, Waiheke and Devonport hit the sweet spot but elsewhere in Auckland work well as a niche service to coastal communities where they are time competitive with car. Kelvin Peninsula hits that sweet spot for ferry operation where a ferry journey is much faster than a car; can be economically operated; and serves affluent coastal communities with a high pre-disposition to use ferry.

As part of earlier work, a mass-transit ferry option was considered, providing frequent ferry service between Frankton Beach and the Steamer Wharf in Queenstown Town Centre. This was discounted through a MCA process due to several factors:

- High operating costs (around \$900 per hour per ferry) due to cost of the vessels (up to \$4 million each) and high crewing requirements (for example, a 200-seat ferry requires a minimum of 5 crew)
- Limited capacity (around 800 passengers per hour) which would not meet modelled demand.
- A significant transfer penalty as nearly all customers would be required to transfer due to its limited walk-up catchment.
- Significant land-use impact for ferry terminal and feeder buses at Frankton Beach conflicting with other aspirations of the Frankton Masterplan.
- Navigation challenges such as speed restrictions and conflicting traffic in the Frankton Arm.

The mass transit ferry option was ruled out through an MCA process at a technical workshop with project partner representation in Queenstown on the 2nd of August 2019.

As a result of this MCA, it was agreed that the ferry option could be dropped from further consideration as it had both high costs; significant issues; attracted very limited patronage and scored poorly against the investment objectives.

The MCA is appended at appendix 2.

5. Building on NZUP Programme with Road Based Public Transport

Business case work to date has identified that road-based public transport options, with the level of public transport priority planned to be delivered by the NZUP process, is sufficient in the medium term to meet the modelled level of demand for public transport in the Wakatipu Basin, including the ability to service

significant growth areas in Ladies Mile and south of the Kawarau River. This would be through a bus-based solution in increments of bus size from the current single-decker fleet to double-decker or articulated buses and later bi-articulated buses (or Trackless Trams). For the purposes of the business case narrative, this has been referred to as the "Bus Max" network and will deliver a step change in high quality, high capacity services across the Wakatipu Basin.

This network would enable the benefits of the NZUP investment in supportive infrastructure to last for a predicted 30 years as well as providing attractive sustainable travel options to current and planned growth areas over the same period. These benefits start to be realised from day 1 of the NZUP programme roll-out but endure over this extended time period.

The proposed Bus Max Network for Queenstown is made up of five bus routes and 1 ferry route:

1. Sunshine Bay to Lake Hayes Estate via Queenstown Town Centre and Frankton
2. Arthurs Point to Arrowtown via Queenstown Town Centre and Frankton.
3. Queenstown TC to Jacks Point via Frankton, Queenstown Airport and Remarkables Park.
4. Queenstown TC to Kelvin Heights Ferry linking to bus to Quail Rise via Frankton and Frankton Flats
5. Frankton Circular – linking all parts of Frankton to each other and the Frankton Hub.

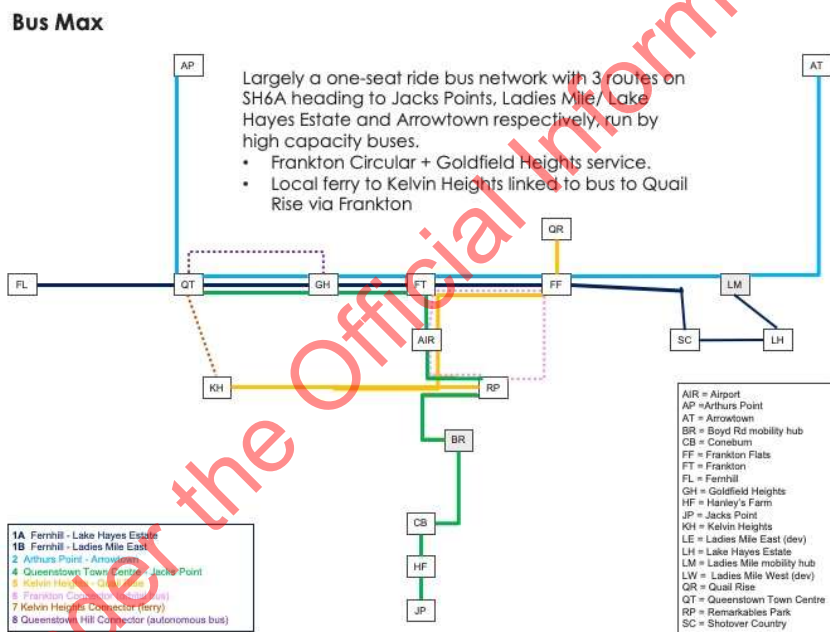


Figure 4 Bus Max Network Plan

Routes 1-3 intertime on SH6A to provide 3-4-minute peak; 5-minute all day service between Queenstown Town Centre and Frankton Hub – this means that getting between Queenstown and Frankton is as easy as 1 – 2 – 3.

Key Bus Max Network Principles:

- Connects all current and future nodes with capacity for growth
- Maximises one-seat rides to minimise end-to-end journey times
- Frequent to midnight (6am-midnight) on all routes
- Limited midnight to dawn service as Queenstown is a 24-hour-a-day visitor destination
- Connections where they add value at high quality hubs
- Efficient to operate and customer friendly

- Network designed to evolve over time – can be staged with increments of demand.
- Reflect master planning direction to the greatest extent possible
- High quality, high capacity vehicles and stops that encourage ridership and stimulate development along the key spines defined in the spatial plan.

A core principle is that the whole network is frequent 6am-midnight with overnight service midnight to dawn on routes 1-3 (each service every 30 minutes – inter-timed to create 10-minute overnight service on SH6A). This would be the 1st 24-hour network in NZ.

5.1 How the Bus Max Network will build up over Time

2020 – 2024 The existing Orbus network is still slowly recovering from the impact of Covid-19, noting that New Zealand's borders are currently closed, and Queenstown is heavily reliant on international visitors. It is currently at 60% of its pre-Covid-19 patronage levels. On normal timetable operation, there are 9 buses per hour at peak on SH6A between Frankton and Queenstown (4 from Airport/Remarkables Park; 3 from Lake Hayes Estate; 2 from Arrowtown) providing an estimated 360 seats per hour. While it is hard to predict Queenstown's rate of economic recovery (and noting that public transport in New Zealand cities has recovered much faster than previously anticipated), it is expected that the current fleet and timetable is sufficient for the next four years, noting that there has already been a 50% increase in peak capacity on SH6A since 2017 with the introduction of the Lake Hayes Direct service in January 2020.

Modelled Demand	Vehicle	Capacity Provided	Fleet Size	Opex Estimated
Current patronage	Standard bus	360 per hour	22	\$4,383,093

2024 – 2027 The public transport demand model shows that there would need to be a bump in service from 2024 to meet the modelled level of demand. The planned staged completion of the NZUP projects in 2023-2024 will lead to a significant step change in the amount of bus priority available on SH6 East, SH6 South and SH6A. While this enables the existing bus fleet to be more efficiently utilised and be significantly more reliable, it will also likely induce a significant increase in demand as the modal choice pendulum will have swung significantly in favour of public transport. The initial thinking is that this demand could be met with moving the current route 1 service (Sunshine Bay – Queenstown TC – Frankton – Airport – Remarkables Park) to a 10-minute frequency with some enhanced capacity buses (e.g. 57 seater single deckers or double-deckers). This assumption is sensitive to the phasing of growth, particularly in the southern growth area, where the current Jacks Point bus service terminates at Frankton Hub, requiring a transfer to complete a journey to Queenstown TC. One response, worthy of inclusion in a DBC investigation, would be extending Jacks Point service to Queenstown TC at this point, providing both more capacity on SH6A and a one-seat ride to Queenstown TC from the southern growth area.

While this can be implemented under the current Public Transport Operating Model (PTOM) through variation of existing bus contracts, it presents funding challenges for the community; and raises the question of allocation of costs and benefits as a lot of benefits fall on visitors who don't directly contribute except for fares e.g. Piopiotahi/Milford Sound and Rakiura/Stewart Island have visitor levies; similar proposals have been floated in Queenstown. How services are funded would be a key element of the financial case in any subsequent DBC work on PT services.

Modelled Demand	Vehicle	Capacity Provided	Fleet Size	Opex Estimated
487	Standard bus	873 per hour	27	\$13,177,351

2027-2030. The timing of a new public transport contract for the Wakatipu Basin would provide for a step change in the level of public transport service. Key elements of this are:

- A new fleet of either articulated and double-decker buses for the core routes, supported by single-decker buses for the Frankton Loop and the Kelvin Heights to Quail Rise service.
- A staged introduction of the three core services, each of which would run every 15 minutes to midnight and every 30 minutes overnight.
- The introduction of frequent ferry service between Queenstown Town Centre and the Kelvin Peninsula seamlessly linked to a frequent bus along the peninsula to Frankton, Frankton Flats and Quail Rise.

- The introduction of the Frankton Loop, providing frequent service stitching all of the parts of Frankton to one another and connecting to very frequent service (every 5 minutes) to and from Queenstown at the Frankton Hub.

This would provide capacity for 1,176 passengers per hour on SH6A on double decker buses and 1,411 on articulated buses.

This requires a very large step change in funding and significant infrastructure investment to support this. To achieve this date and to secure an appropriate level of funding – including making challenging choices about how-to best line up costs and benefits – requires work to get underway very soon. Just one example would be the requirement for a large, flat piece of land for the depot that is well connected to the state highway and minimises dead running for buses. Fleet acquisition is another element. A working assumption of an electric bus fleet from 2027 requires consideration of charging infrastructure and resolution of outstanding issues regarding double-decker electric buses of suitable capacity (dependent on vehicle choice). Similarly, with double-deck operation, significant clearance work is likely to be required on parts of the network to enable double-decker operation.

Modelled Demand	Vehicle	Capacity Provided	Fleet Size	Opex Estimated
848	Double-decker or articulated	1,176-1,411 per hour	35	\$23,840,986

2030-2039 Public transport modelling has shown that a further step change in capacity is required in 2030 to meet projected growth. The core element of this is an upgrade of the three core services to a 10-minute frequency for at least an extended peak period. This would provide for 18 buses per hour to run on SH6A between Frankton and Queenstown TC. This would provide capacity for 1,393 passengers per hour on SH6A on double decker buses and 1,671 on articulated buses.

The major financial implication of this is the additional fleet requirement at this point and the additional opex to provide the higher level of service.

Modelled Demand	Vehicle	Capacity Provided	Fleet Size	Opex Estimated
1,060	Double-decker or articulated	1,393-1,671 per hour	39	\$25,391,506

2039-2051 A key constraint of bus-based options is that performance starts to significantly degrade beyond around 18-20 vehicles per hour. Beyond this point, there is significant bunching where multiple buses arrive at stops at the same time and buses "bunny hop" each other along the route. A frequency of 3-4 minutes at peak means an average wait time for customers on SH6A on random arrival of 90-120 seconds in the peak and 150 seconds at other times. Adding additional frequency beyond this point adds marginal if any benefit to customers as increased frequency is more than counter-balanced by decreased reliability which makes customer journeys slower.

With that in mind, the best way to add capacity once double-decker or articulated buses run out of capacity is to provide a higher capacity vehicle. At this point bi-articulated buses would be required. This would provide capacity for 150-170 passengers (in event mode) per vehicle. The illustration below shows such a vehicle. This would provide capacity for 1,802-2,500 passengers per hour, noting that a key element of opex, bus drivers, does not change under bi-articulated bus operation. Also, of note is the date a fleet upgrade is required is interdependent on the previous choice of double-decker or articulated buses as the latter provides more capacity and hence could meet demand for longer.

Modelled Demand	Vehicle	Capacity Provided	Fleet Size	Opex Estimated
1,539-2,322	Bi-articulated or trackless tram	1,802-2,500 per hour	34-50	\$26,563,421 to \$39,063,855



Figure 5 Proposed Brisbane Metro Bi-articulated Bus

6. Offline Public Transport

As noted previously, the business case work to date has identified that on-road public transport can meet the expected demand until around 2051. Previously, off-line HCPT options had been explored such as a gondola option. While the gondola option provides a number of attractive features such as hyper-frequency (<30 seconds between gondola cabins), capacity and a great visitor/ customer experience, on-road public transport options can feasibly be implemented under current public transport operational and procurement frameworks and are the best option to maximise the value from the \$90 million NZUP investment in supporting public transport infrastructure.

Given that the on-road public transport options are expected to have sufficient capacity for 30 years, then it is suggested that consideration of an off-line system be put on hold and reviewed in 2028 based on updated forecasts at the time and other factors at that time such as travel behavioural change and technology.

Another challenge with the gondola is that it does not fit well into the current legislative and public transport procurement processes but could be delivered by the private sector for its tourism benefits. In that event, it would be worth considering whether there was merit in public investment in any public transport benefit that this might deliver.

7. Frankton Hub

The Frankton Hub will be the one place on the entire Wakatipu Basin public transport network where everything connects as every service passes through this hub at some point on its journey. It also connects well to the active mode networks such as the Frankton Trail and is close to significant trip attractors such as the Queenstown Events Centre and retail opportunities in Old Frankton and on the Frankton Flats. As such, getting the Frankton Hub right is absolutely crucial to delivering all other public transport elements.

There are four critical success factors for the Frankton Hub:

1. It needs to work well for public transport customers
2. It needs to work well for public transport operations
3. Given its gateway location, it needs to present a great image for both public transport and for Frankton and Queenstown
4. It needs to be a part of its urban realm, not apart from the urban realm.

5. It needs to be the one place where urban buses connect with regional, tour, ski and Milford Sound buses to enable seamless bus to bus transfers.

There are good and poor examples of public transport facilities in regard to the above factors. The illustration below is of the New Lynn TOD, widely regarded as being a high-quality public transport hub that integrates well with the urban realm and supports and is supported by TOD.



Figure 6 New Lynn TOD, Auckland

While a Frankton Hub location around the intersection of SH6A and SH6 is optimal from an operational, customer and urban integration point of view, it presents challenges as this location is close, but not close enough, to Queenstown Airport. To address this, one of the bus max services will connect direct to the airport from the town centre (every 10 minutes peak; every 15 minutes other times) as well as Frankton Loop every 15 minutes. This means that there is a one-seat ride from the town centre to the airport at least four times an hour during airport operating hours and at least eight times per hour from the Frankton Hub. It is approximately a 10-12 minute flat walk between the hub and airport but if there were appetite for thinking more ambitiously about the airport connections, a possible international comparator would be the Billy Bishop Airport pedestrian tunnel/ traveller that connects mainland Toronto to Billy Bishop Airport which is on an island. <https://www.billybishopairport.com/to-from/pedestrian-tunnel>

Some key issues that remain to be addressed at the Frankton Hub are:

- Should this provide a start-up point for Milford and regional/ long distance buses, fed by the high-frequency Bus Max services? (as current thinking provides well for these buses to stop to pick-up/ set-down but not to start their journeys at the Frankton Hub). This could address some town centre issues but would also have potential negative trade-offs for the town centre (such as encouraging visitors to stay in Frankton rather than the town centre).
- Double-decker versus articulated bus operation? This is a key project decision that needs to be made in advance of any subsequent DBC work as it will drive the design of the Frankton Hub.

8. TOD/ Wider Economic Benefits

The principles of transit oriented development (TOD) put transport and land use integration at their core. This is the distinction between whether transport serves land use or whether land use shapes and is in turn shaped by transport. As noted earlier in the paper, a fundamental building block of the programme is its tight integration with public transport and active mode supportive land use. For example, the Ladies Mile Masterplan process, just getting underway, is working in a transport context of congested car-based networks that are beyond capacity at peak times. This means that for Ladies Mile to be attractive for future residents, it needs to have local amenities such as schools, parks, local shops and community social infrastructure within easy walking and cycling distance supported by high-capacity public transport linking it to retail, social, recreational and employment opportunities in Frankton and Queenstown.

The achievement of TOD is a key aspiration of the emerging Spatial Planning process but will require significant changes to current planning controls to enable it and a shift in market economics away from car-oriented developments in order to be actually implemented.

It is important to understand that high quality public transport and active mode choices are a key pre-requisite for TOD but are not a guarantor of its success in its own right. Wider economic benefits can be achieved in developments around transit hubs but not in a planning context that is simultaneously facilitating or even requiring car-oriented developments. In the end, it is a combination of a supportive planning context; favourable economic conditions; public sector skin in the game and patient private or private money to enable TOD to happen.

9. Capex and Opex Requirements

The opex required to operate this network rises to \$13,177,351 in 2024 in a step change designed to meet the demand from the implementation of the NZUP programme. The first stage of the Bus Max network in 2027 sees an increase to \$23,840,986 with the full Bus Max roll-out on the initial fleet (double-decker or articulated bus) taking it to \$25,391,506. This provides enough capacity to around 2039. At this stage, bi-articulated buses would provide for a step change in capacity with an initial estimated gross opex cost of \$26,563,421, rising in stages to \$39,063,855 for a fleet that would meet modelled demand until 2051.

Of note is that this is gross opex and farebox revenue is netted off this network. **If modelled patronage is achieved, assuming a continuation of \$2 fares, there would be a very high farebox recovery ratio, significantly reducing the net cost to support this network.** Also, important to note that the transition from double-decker or articulated bus to bi-articulated bus or trackless tram only modestly increases opex as the biggest element of opex, driver wages, do not change.

Some indicative work has been done on capex items, the largest of which would be for the bus fleet. For example, a full fleet for the full rollout of Bus Max in 2030 is estimated at \$46 million, including the standard 12% spares ratio. While bi-articulated buses are more expensive, fewer are needed to transport the same number of customers so the opex and capex implications are comparatively modest. A critical capex item is a depot location on flat industrially zoned land of a suitable size to store a large bus fleet. Depot location and operation is normally an operator responsibility and cost under the Public Transport Operating Model (PTOM). Electric bus operation may also have cost implications in terms of charging infrastructure. This normally takes place in depots overnight and is typically incorporated into opex.

10. Implementation Considerations

The bus max model can be implemented under current New Zealand legislative and public transport procurement processes but requires a considerable step-up in both capex and opex over current levels of public transport in the Wakatipu Basin. Double-decker and articulated buses are both authorised to operate on roads in New Zealand (but see notes below) while bi-articulated buses do not currently operate in New Zealand.

Some key implementation considerations and issues for consideration as part of a Detailed Business Case are:

- Institutional frameworks and division of responsibilities and accountabilities.
- Double-decker buses may require considerable investment in clearance works such as power and light poles, street trees and other intrusions into the road right-of-way.
- Vehicle axle weights and loadings may be a challenge particularly on lower volume local roads. This is particularly the case where electric bus batteries are at the rear of the bus.
- Articulated buses may have tracking and vertical clearance issues. Clearly, careful vehicle choice would be needed to avoid this issue.
- Ownership of fleet and infrastructure is as yet undetermined. Public fleet ownership would be a big upfront cost but would significantly reduce ongoing opex (as currently bus fleets capital are funded through opex). Conversely, funding the fleet through opex would spread the cost over a longer period but would require bank finance to support this.
- Funding considerations in term of how to align costs and benefits. At present, the ratepayers of the public transport service area and the National Land Transport Fund pay roughly equal shares of the public funding requirements. But many of its benefits accrue to international visitors and considerably increased funding requirements are likely to put a significant burden on ratepayers.

- Frankton Hub is likely to be on crown land and the requirements of NZUP for investment on crown-owned assets imply that the New Zealand government may need to own the hub, at least initially.
- Depot site and ownership due to the requirement for a large, flat, industrially zoned site with easy access to the public transport spine network (to minimise dead running)
- Infrastructure such as charging for electric buses and whether this is depot-based, on-road or a combination of the two as well as the timing of charging and its power drain.
- The southern Bus Max route assumes the availability of a spine road linking Coneburn, Hanleys Farm and Jacks Point which puts those communities within walking distance of public transport.
- The assumption that traffic generation from Ladies Mile's does not negatively impact the operation of the Bus Max network through Ladies Mile.

11. Decision Sought

Board to note context of this paper is an input to a proposed Detailed Business Case on public transport services and infrastructure to address the range of detailed issues needed to move HCPT towards implementation.

Board to approve that off-line PT to SH6A (e.g. a gondola) is parked and reviewed in 2028.

Board to advise how to progress PT operational aspects to the next level of detail given fleet requirements and step change is fundamental to capitalising on infrastructure investment and achieving mode shift. This is in terms of progressing to a PT service operation DBC and also whether it should fit under W2G given W2G current mandate does not cover construction or operations.

12. Appendix 1

Public Transport Development Pathway Opex				
Year	Modelled Demand	Capacity Provided	Fleet Size	Opex required
2024	487	873	27	\$13,177,351
2027	848	1,176	35	\$23,840,986
2030	1,060	1,393	39	\$25,391,506
2039	1,539	1,802	34	\$26,563,421
2044	1,802	2,090	42	\$32,813,638
2051	2,322	2,500	50	\$39,063,855
Gross opex (fare revenue is netted off this); uninflated costs in 2020 \$; opex estimates 2039 onwards assume +20% opex for bi-articulated bus operation. Costs are for the whole Wakatipu Basin bus network.				

13. Appendix 2 High Capacity PT Options MCA

Public Transport Network Options Multi-criteria Analysis						
	Do Min	Bus Max	Trackless Tram	Trackless Tram Max	Gondola	Ferry
Can Achieve significant mode shift	1	2	2	3	2	1
Sustainably manage growth	-3	3	2	3	3	1
Resilience - Network Events	0	1	0	1	3	2
Resilience - Natural Hazards	-1	0	-1	-1	1	2
Reliability	-2	3	1	3	3	3
End to end journey time	-1	3	2	3	2	1

Towards Vision Zero	0	2	1	2	3	3
Modal Integration	1	3	2	2	1	-2
	Do Min	Bus Max	Trackless Tram	Trackless Tram Max	Gondola	Ferry
Operational Flexibility	-1	2	0	2	0	2
Affordable (capex)	2	-2	-1	-3	-2	0
Affordable (opex)	3	2	3	3	1	-2
Resident/Visitor experience	-2	1	2	3	1	1
Urban design and development	-3	3	2	3	1	0
Environmental Impact	-3	1	1	1	2	-3
Access for local communities	-2	3	2	2	1	-1
Construction impacts	3	-1	-3	-2	3	3
Alignment with Masterplan and spatial plan	-3	1	1	2	3	-1

Prepared by:

s 9(2)(a)

Lead – Transport and Land Use Integration

Reviewed By:

s 9(2)(a)

Project Team Leader

**Appendix B6 Technical Note 12: Queenstown Public Transport
Development Story**

Released under the Official Information Act 1982

NZTA Contract 2018235 - F2Q SSBC & QTC DBC

Technical Note #12

18 February 2020

Queenstown PT Network Development Story

Introduction

This document provides a summary of the development of public transport network options as part of the Frankton to Queenstown and Queenstown Town Centre business case processes.

Previous Queenstown Public Transport Network

Prior to November 2017, Queenstown's public transport network, known as Connectabus, was provided on a commercial basis by Ritchies.

This network offered many of the features of the current Orbus network – such as a 15-minute frequency between Queenstown Airport and Queenstown Town Centre and a feeder network at Frankton Hub.

However, the key difference was fare levels with a cash fare from Queenstown Airport of \$12, discounted to \$10.50 with a smart card.

The service was unsubsidised and fare levels constituted a significant disincentive to its use.

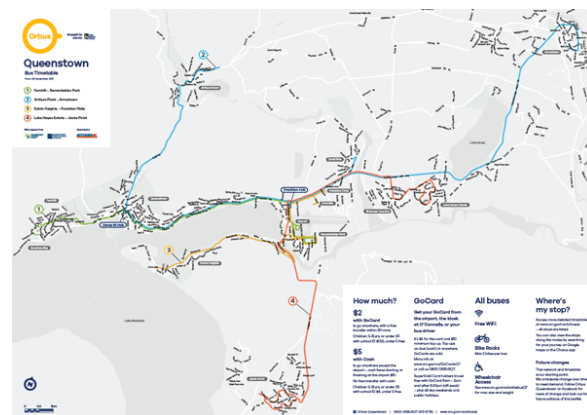


Orbus Network

In 2017, the decision was taken to move to a subsidised network model with a simplified network.

Key network changes from the Connectabus network were:

- Combining the Fernhill service with the Town Centre to Airport/ Remarkables Park service to provide a single frequent core service.
- Improvement of the Arrowtown service to an all-day, every day of the week service.
- New service to developing areas of Jacks Point.



Apart from network simplification, the key feature of the new network is a \$2 flat fare on a GoCard (including a free transfer within 30 minutes). Funding for the new network came from Otago Regional Council via a targeted rate levied in Queenstown; a direct contribution from Queenstown Lakes District Council from increased parking charges in Queenstown Town Centre and New Zealand Transport Agency funding.

The results from the implementation of the Orbus network have been impressive with patronage rising from 40,000 per month under the Connectabus network in December 2016 to 90,000 per month in December 2017, just one month after the launch of the Orbus network, to 120,000 per month in December 2018.

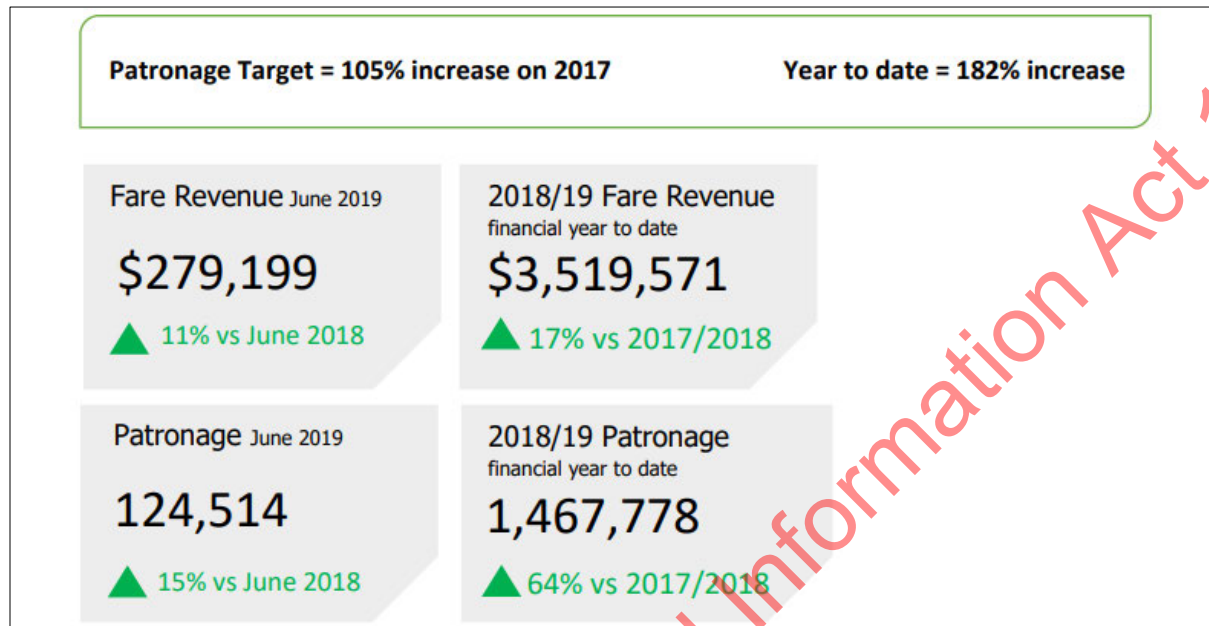


Figure 1 Data Supplied by Otago Regional Council

While the rate of patronage growth has slowed considerably, it is striking to see that a quiet month of the year, June in 2019, had triple the patronage of a busy month, December 2016, just two and a half years previously.

Identified network gaps

While the Orbus network has had impressive results, customer and bus driver feedback and observations by the project team during public engagement events have revealed a number of areas for improvement. To quite an extent, the success is focused on the one-seat ride elements of the network - the frequent services to Fernhill, Airport/ Remarkables Park and the now all-day, every day Arrowtown service. The feeder elements of the network have not performed as well, except for significant peak demand out of Lake Hayes Estate and Shotover Country.

Key deficiencies identified by customers and project staff in project feedback sessions were:

- A strongly expressed desire for direct bus service, at least at peak, from Lake Hayes Estate/ Shotover Country to Queenstown Town Centre.
- Poor customer experience at the Frankton Hub and in Queenstown Town Centre.
- Poor time integration to and from feeder services at the Frankton Hub and the absence of secure connections between services.
- The lack of bus services and bus stops to rapidly emerging retail centres on the Frankton Flats.
- Conflicts between tour coaches, taxis, drop-offs, long-distance buses and urban buses at the Frankton Hub.
- Lack of bus priority leading to severe delays for bus services, especially exiting Shotover Country and heading to the Shotover River Bridge (exacerbated at the time by roadworks at Tucker Beach Road) and on the approach to Queenstown Town Centre.
- Poor visibility and service information at Queenstown Airport plus the \$10 cash fare (\$5 from any other stop) for trips to or from Queenstown Airport.

Rapid & Targeted Interventions

A Rapid and Targeted Interventions project was developed to address some of above customer issues. The aim is to identify relatively low-cost measures that can implemented relatively quickly (within 6-18 months). Some of the potential bus-related measures identified include:

- Plugging gaps in bus stop coverage.
- Bus priority out of Shotover Country and towards the Shotover River Bridge.
- Direct bus service from Lake Hayes Estate/ Shotover Country.
- Bus priority on the approach to the BP Roundabout in Frankton.
- Bus re-routing via Coronation Drive on the approach to Queenstown Town Centre to avoid congestion.

A number of these measures are working their way through the process towards implementation.

Business Case Process

The Stantec/ WSP Opus/ Abley/ Jasmax consortium was engaged in 2018 to develop a Single Stage Business Case for the State Highway 6A Frankton to Queenstown corridor as well as a Detailed Business Case for Queenstown Town Centre. The former is focussed on finding a solution to the corridor rapidly reaching capacity in the fastest-growing area of New Zealand and the latter was focussed on identifying how transport solutions could work to the maximum extent possible to deliver on the Queenstown Town Centre Masterplan.

It became clear early in the process that four-laning Frankton Road (State Highway 6A) for additional private vehicle capacity would neither be desirable nor meet the investment objectives established at the outset of the project. While gains in patronage on the Orbus network have been impressive, it was swamped by the sheer rate of growth in both population and the growth in traffic on State Highway 6A. The anticipated future growth trajectory means that growth is continuing and therefore ongoing public transport improvements are needed to accommodate future growth on the corridor

A much higher order of interventions would be required in order to safely and sustainably meet future demand for travel to and from Queenstown Town Centre. This would involve improvements to active modes; improved parking management in the town centre as well as a wide range of other travel demand management tools but these measures would need to be led by a headline high capacity public transport (HCPT) option (or options). Significant mode shift is required to keep Queenstown moving and support its function as a premier year-round visitor destination.

Even though the two business case processes were confined to a specified geographic scope, it quickly became apparent that it was not possible to adequately evaluate HCPT options without thinking about their broader network impacts, given that most of the trips within the study area originate from outside of it.

This is important so that there can be an understanding of how HCPT options integrate with their wider networks and to give a clear line of sight to the trade-offs inherent in each of the options.

As a result of this, a number of full network options were identified, based on the following principles:

Public Transport Network Options Principles

- The service area for each option is the service area of the current Orbus network.
- Each option needs to be self-contained and provide service to the whole Orbus service area.
- Frequent service at all times – from 6am to 1am every day of the week - on the HCPT option between the Town Centre and Frankton, connected to frequent feeder services.

- Simplicity is key to network legibility and use, particularly in a market like Queenstown with a largely transitory workforce and where travel is heavily focused on the visitor market.
- Each option is "like-for-like" to the maximum extent possible within the inherent limitations of each mode so that the evaluation is on a "comparing apples with apples" basis.
- Each option, apart from the do-minimum, needs some degree of "wow" factor in terms of customer experience and its role in a premier resort destination.
- Connect all current and future nodes and minimise end-to-end journey times
- Connections where they add value; efficient to operate and design to evolve over time.
- Reflect Queenstown Town Centre and Frankton Masterplan direction where possible
- To address a range of customer issues identified during engagement processes.

Common Public Transport Network Elements

- All network options are built around a bus-based structure
- Road based frequent public transport between Queenstown/Frankton and core residential and activity area at Arrowtown, Jack's Point, Arthur's Point, Kelvin Heights and Fernhill
- A core spine provides high capacity, high frequency services between the Airport/Frankton and Queenstown town centre

Network Options

The overarching assumptions underlying each of the options is summarised in the table below:

Overall assumptions for Queenstown Public Transport options						
Mode	RTI Network	Do Min	Bus Max	Trackless Tram (Base & Max)	Gondola	Ferry
SH&A Frequency	7.5 minutes	6 minutes	3 minutes	5 minutes	15 seconds	15 minutes
Peak vehicle requirement	20 SD buses (+ spares)	26 SD buses (+ spares)	44 DD buses (+ spares) 6 SD buses (+ spares) 2 small buses (+ spare) 1 small ferry	24 trackless trams 12 SD buses 2 small ferries 6 autonomous buses	60 gondola cabins 20 SD buses 2 small ferries 6 autonomous buses	4 medium ferries 1 small ferry 28 SD buses 4 autonomous buses
Hourly F2Q capacity	400 per hour	600 per hour	2,200 per hour	1,800 per hour plus buses	2,400 per hour plus buses	800 per hour plus buses
Priority assumptions	RTI projects only	Localised priority	Extensive public transport priority on MRT corridor (except in Trackless Tram base option)			
Capacity assumptions						
Vehicle type	Standard bus	Double-decker bus	Autonomous/ small bus	Ferry	Trackless tram	Gondola
Capacity	50	100	20	Small 50; medium 200	150	10

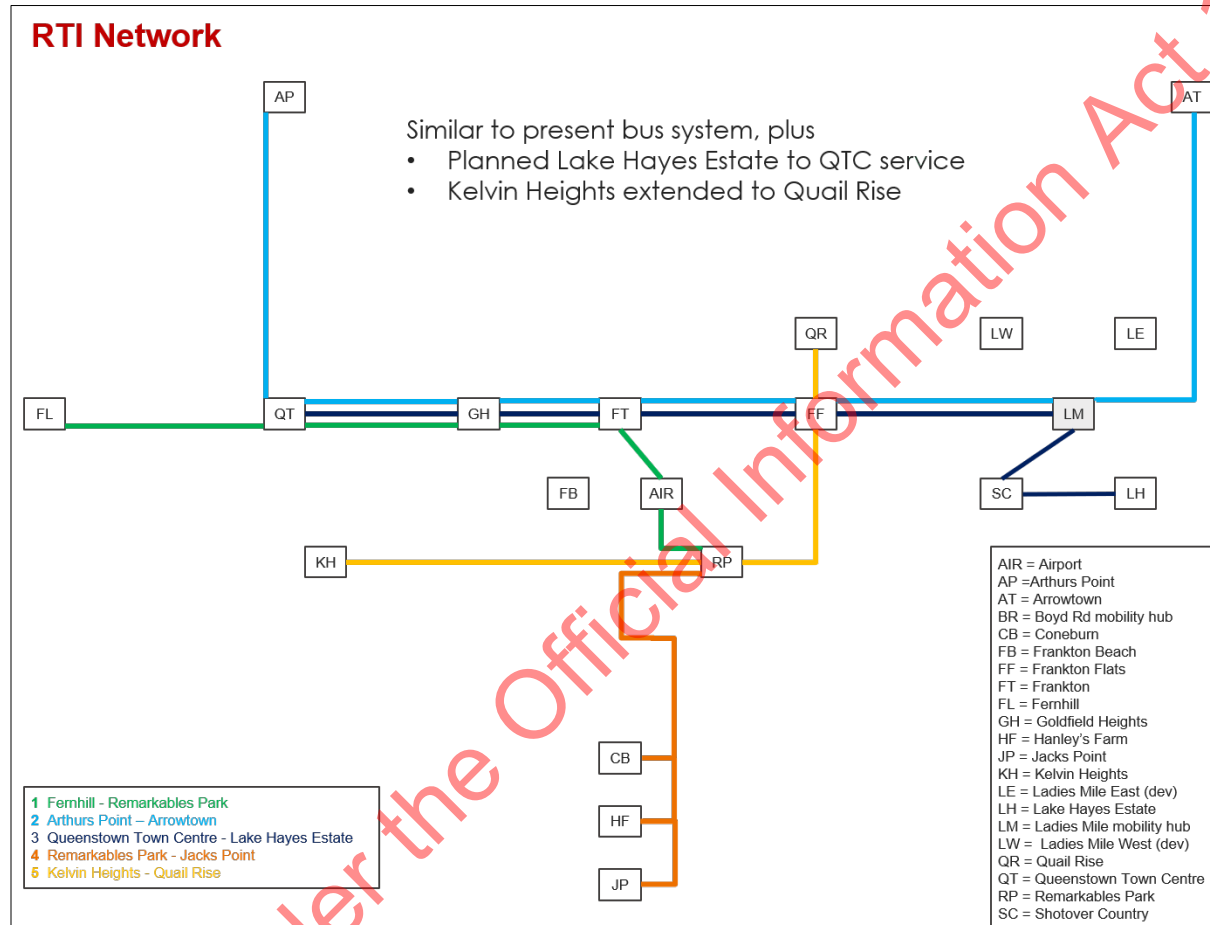
Notes: SD = single decker bus; DD = double-decker bus; F2Q = Frankton to Queenstown. While Bus Max is assumed to be double-decker buses, they could also be higher capacity – e.g. articulated – buses.

The following pages contain a brief description of each of the options, together with a schematic diagram which demonstrates how they fit into a wider public transport network.

Rapid and Targeted Interventions (RTI) Network

This network implements service improvements that are part of the RTIs.

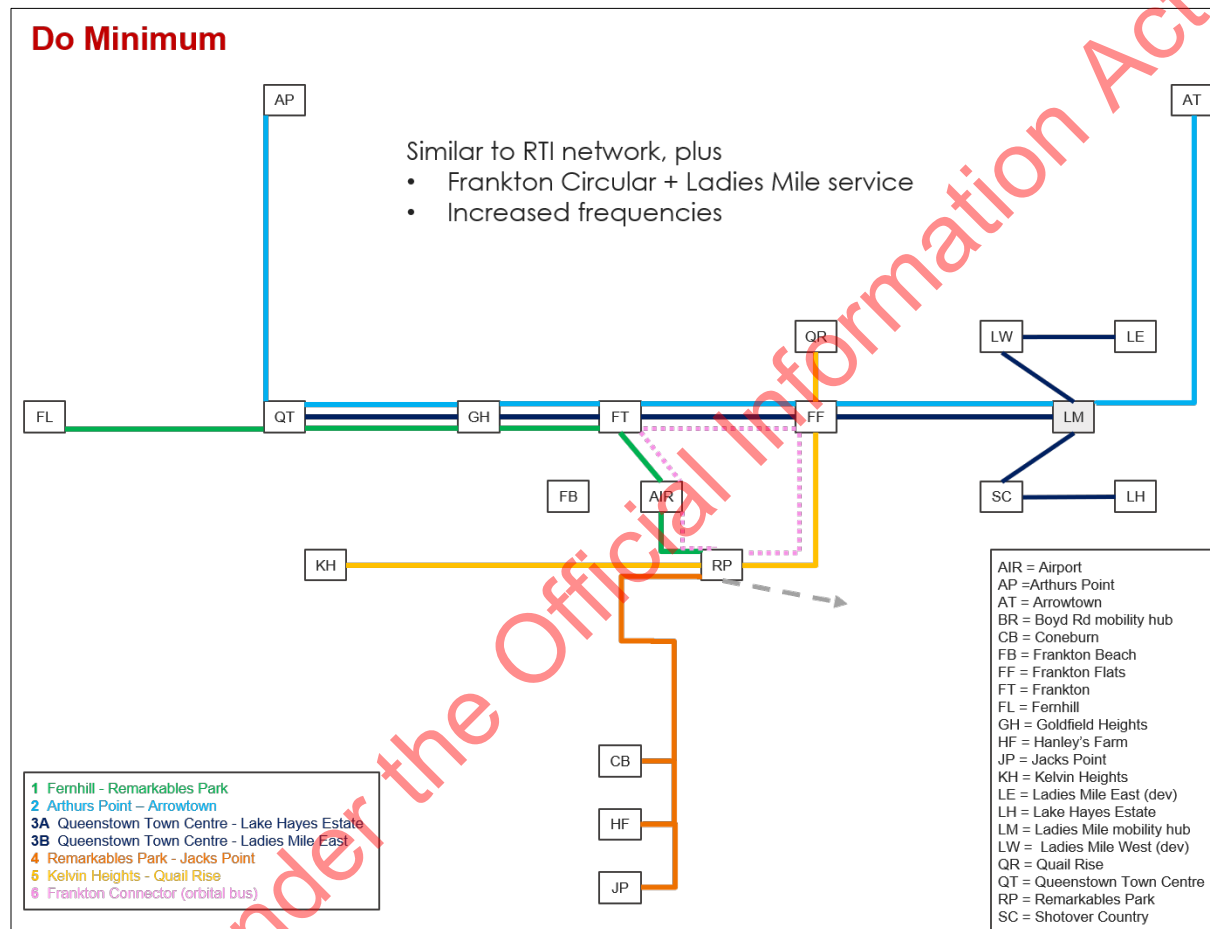
This network implements the Lakes Hayes Estate to Town Centre service which forms part of the Rapid and Targeted Interventions network, together with the extension of the Kelvin Heights service to Quail Rise. Frequencies are similar to current levels.



Do Minimum Network

This is the base option against which the other options are evaluated.

it includes some limited improvements to the existing bus system using the current or renewed diesel bus fleet. This includes direct service from Lake Hayes Estate and Jacks Point to Queenstown Town Centre with some improvements to current frequencies. A programme of short-term interventions (currently being developed and named the Rapid and Targeted Implementation programme) assumed as part of this.

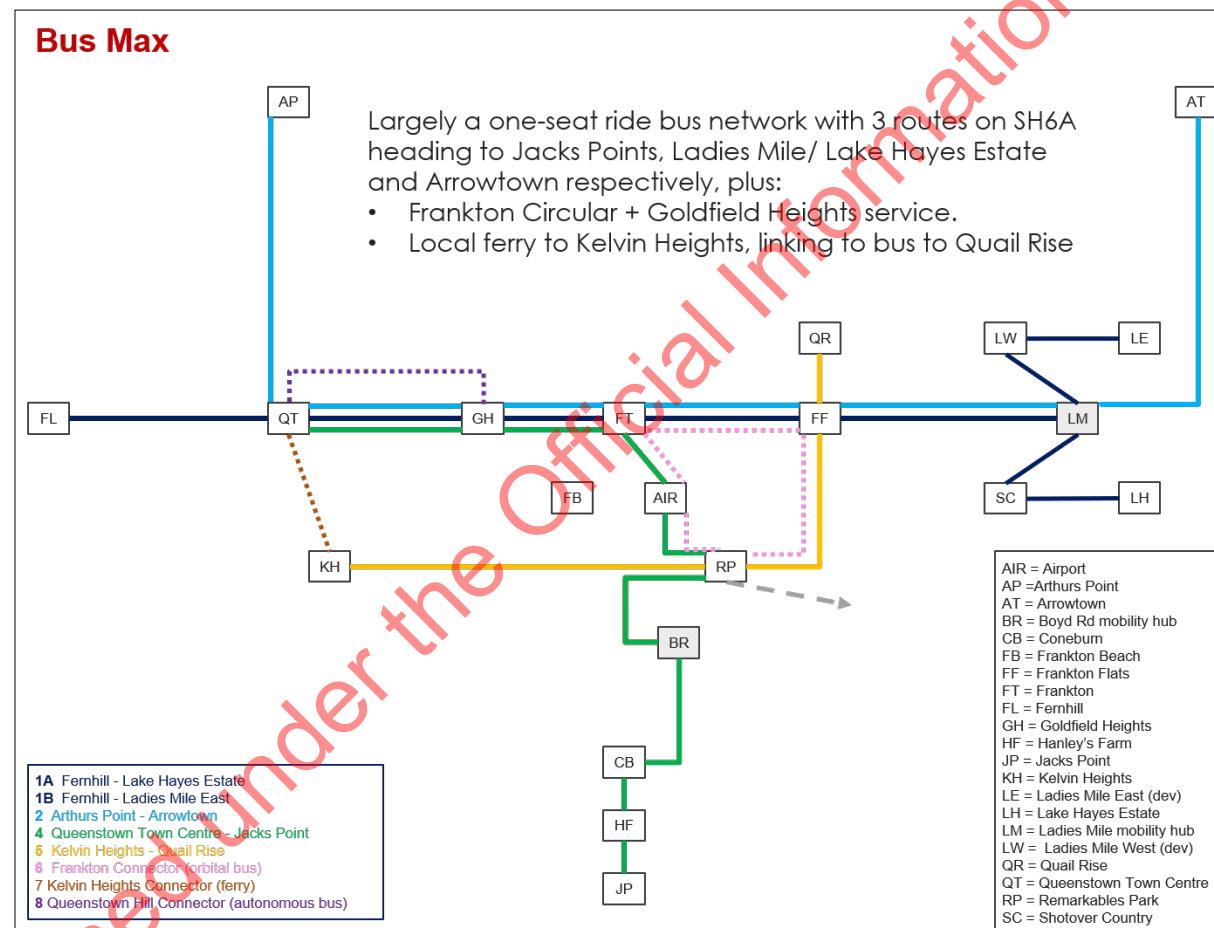


Bus Max Network

This network aims to maximise the use of conventional buses, using electric double-decker buses, on a largely one-seat ride network with some feeder service.

This network would have full priority on State Highway 6A from Queenstown Town Centre to Frankton. Largely a one-seat bus ride network with direct service from Queenstown town centre to Arrowtown, Arthurs Point, Jacks Point, Lake Hayes Estate and Ladies Mile. Three services intertime on SH6A to provide a 3-minute peak, 5-minute at other times service. Operated with electric double decker buses on SH6A routes accommodating 100 passengers. Local ferry to Kelvin Heights connecting to a bus to Quail Rise via Frankton Flats. There is also a Frankton circular bus and hillside shuttle to Goldfield Heights.

Note that this network could be run by articulated buses but there are potential spatial implications in the town centre as an articulated bus is 17-metres long, versus a double-decker bus at 12 metres..

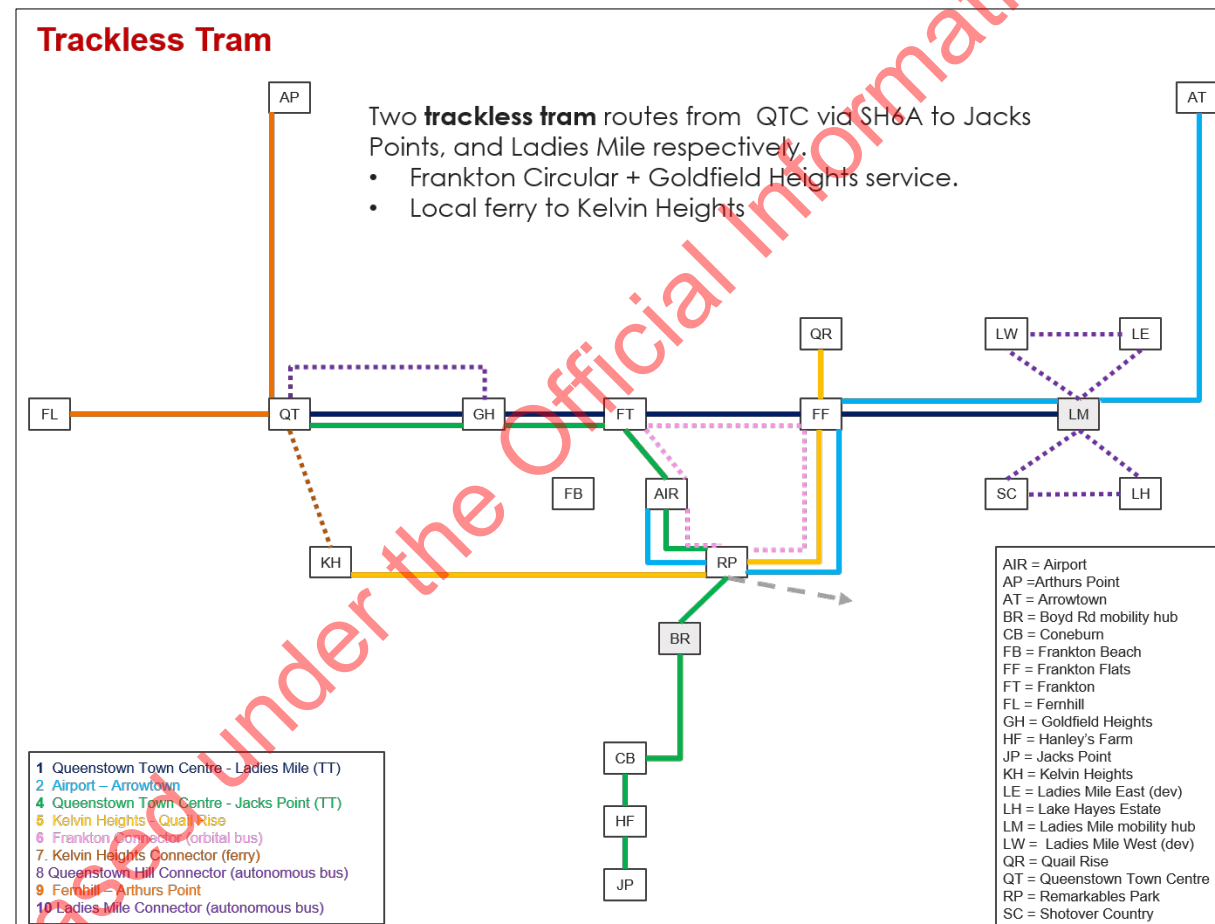


Trackless Tram Network

This network provides two trackless tram routes from Queenstown Town Centre to Ladies Mile and Jacks Point respectively. This is a mixture of a one-seat ride plus feeder network.

The **Trackless Tram Base** option provides partial priority on State Highway 6A, mainly on the westbound exit from Frankton and around planned signalised intersections. Two core routes from Queenstown Town Centre to Ladies Mile and Jacks Point, with some feeder services and local shuttles (which may be autonomous). Operated by 24-metre bi-articulated vehicles ("trackless trams") able to accommodate 150 passengers. Two services intertime on SH6A to provide a 5-minute at all times service. Local ferry to Kelvin Heights connecting to a bus to Quail Rise via Frankton Flats. Local ferry to Kelvin Heights connecting to a bus to Quail Rise via Frankton Flats. There is also a Frankton circular bus and hillside shuttle to Goldfield Heights.

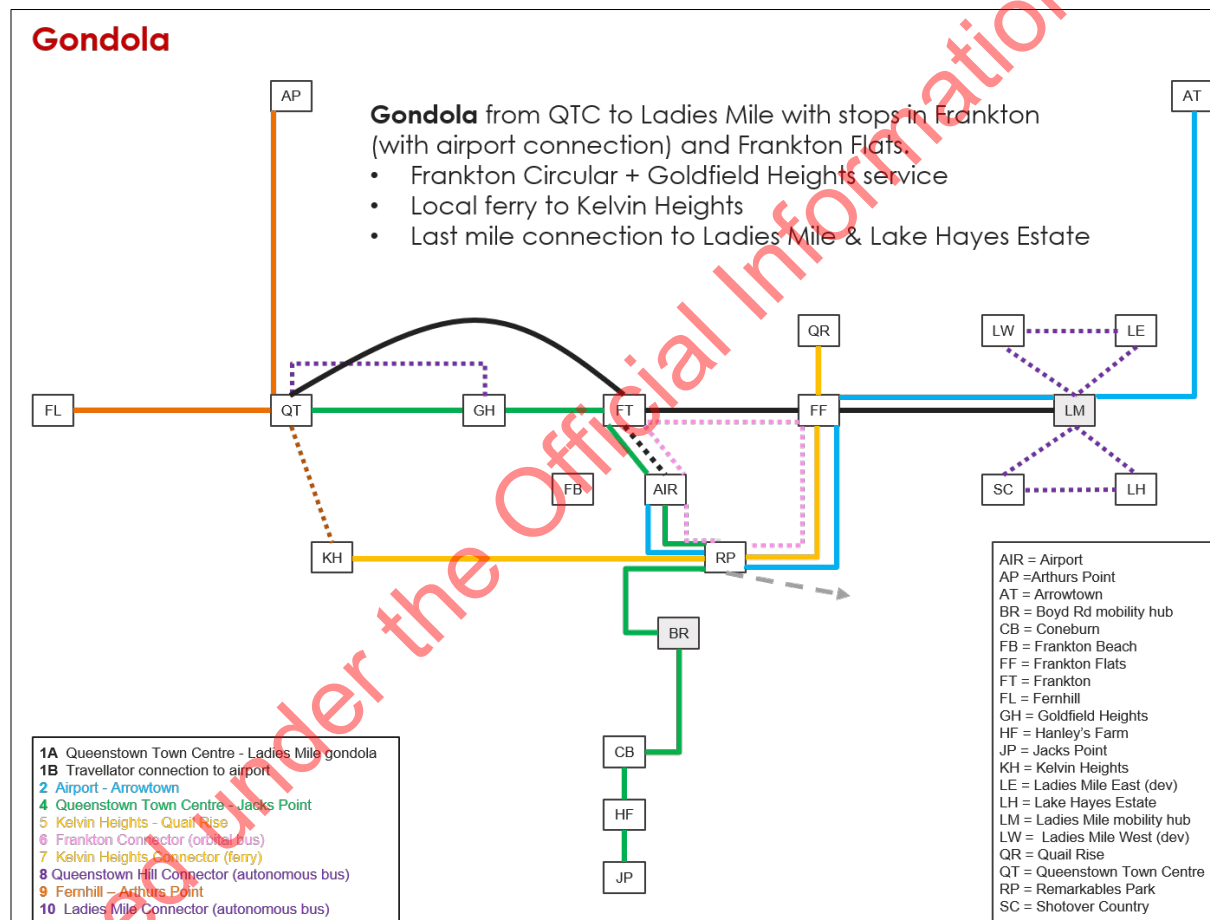
The **Trackless Tram Max** option is as above but with full priority on State Highway 6A from Queenstown Town Centre to Frankton.



Gondola Network

A gondola from Queenstown Town Centre to Ladies Mile with stops at Frankton Hub and Frankton Flats. A hub and spoke network with extensive feeder service to the primary high-demand spine route.

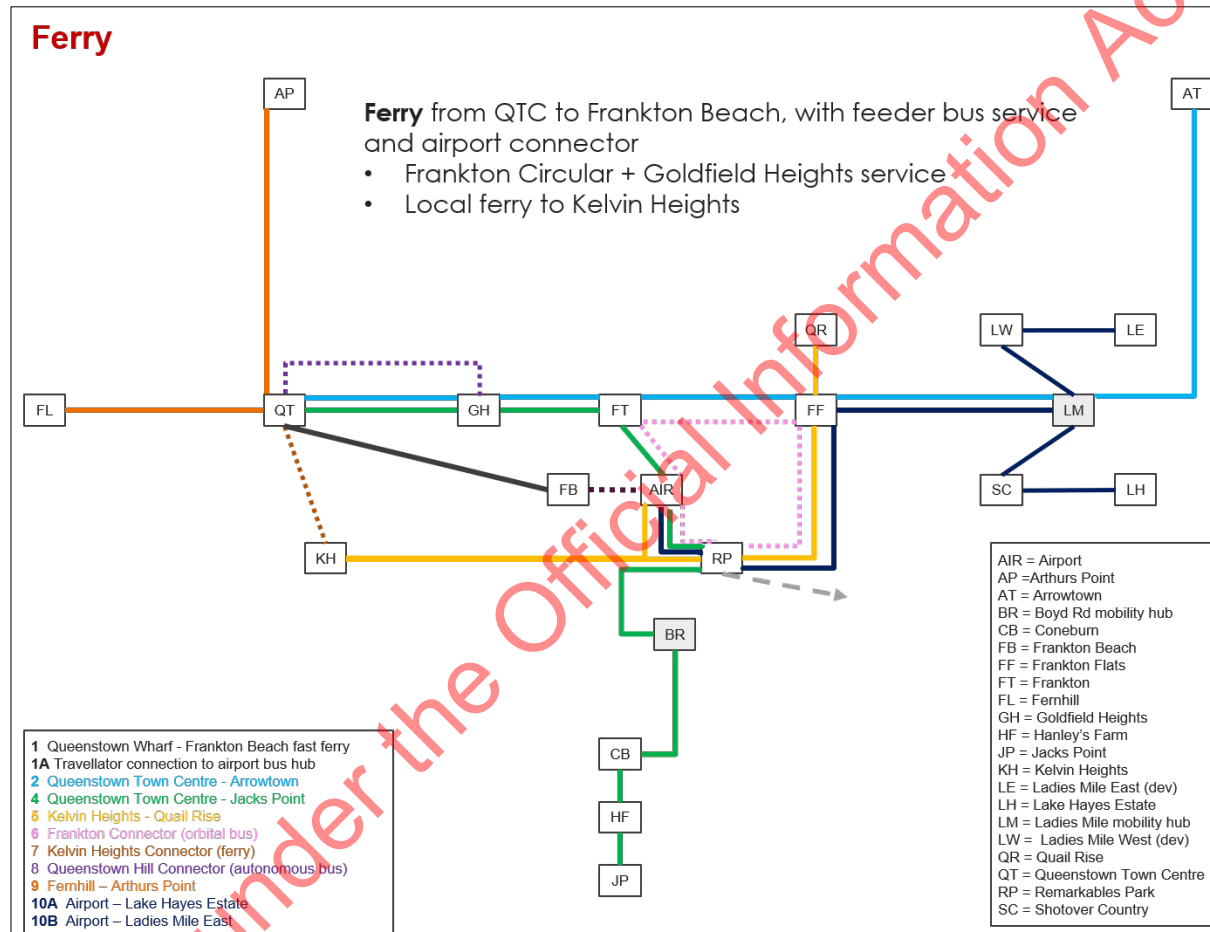
The gondola network runs from Queenstown Town Centre to Frankton Hub, where a traveller connection to the airport is available, with the option to extend the gondola to Ladies Mile with a stop at Frankton Flats if required to support future land use. Service is continuous with an assumed cabin every 15 seconds. Each cabin can fit 10 passengers. Assumed travel speed is 22km/h. While slower than other mode options in free-flow conditions, it is in a completely separate corridor and has a considerable "wow" factor as a mode and is as much of a "turn up and go" service as is currently possible with public transport. A feeder bus network to Frankton Hub helps fill out the network. Local ferry to Kelvin Heights connecting to a bus to Quail Rise via Frankton Flats. There is also a Frankton circular bus and hillside shuttle to Goldfield Heights.



Ferry Network

A frequent at all times fast ferry from Queenstown to Frankton Beach pulsing with a frequent feeder network to ensure seamless modal transfers.

A ferry from Queenstown Town Centre to Frankton Beach, with connections there to other bus services, running at the same frequency and pulsing around the ferry timetable. Assuming a 200-seater catamaran running every 15 minutes at all times. In addition, there is a local ferry to Kelvin Heights connecting to a bus to Quail Rise via Frankton Flats. There is also a Frankton circular bus and hillside shuttle to Goldfield Heights.



The Evidence Base

This section provides a summary of the evidence collected in support of a Multi Criteria Assessment for the Queenstown public transport network options. It has been developed based on information contained in modelling files and technical notes supplemented by professional judgment.

Investment Objectives

The combined investment objectives for Frankton to Queenstown Single Stage Business Case and the Queenstown Town Centre Detailed Business Case are as follows:

- Provides more efficient and reliable access for people and goods that:

- a. Sustainably manages high growth
- b. Reduces reliance on private vehicle travel
- c. Enables enhanced land use
- o Is adaptable to change and disruption
- o Enhances the liveability and quality of the natural & built environment
- o Enhances safety with a goal of vision zero

Evaluation Framework

An evaluation Framework has been developed to evaluate public transport network options between Queenstown Town Centre and Frankton – linked to broader networks - with a supporting evidence base which links a series of factors directly to the investment objectives.

For full details of the evidence base and the evaluation criteria, refer to the Evidence for Queenstown PT Network options MCA memorandum. The evidence base summary below focuses on key differentiators between the options.

EVIDENCE BASE SUMMARY

Provides more efficient and reliable access for people and goods that Sustainably manages high growth

Bus Max can meet the demand in the short-term but has finite capacity and relies on very extensive priority to avoiding bus bunching and the avoidance of significant issues in the town centre. At some point, it will simply run out of feasible capacity. **Trackless Tram** has more capacity and has some ability to be expanded. **Gondola** has the capacity to manage demand for the evaluation period and beyond. **Ferry** could manage high growth but doesn't because it doesn't attract much patronage which would mean that SH6A would remain heavily congested.

Reduces reliance on private vehicle travel

Bus Max and **Trackless Tram** achieved 47% and 51% mode share at 2048 respectively. Initially, the **Gondola** based network did not perform as well but new evidence – since the initial evidence base was prepared - about its capacity, speed and frequency significantly improved its performance. **Ferry** performed very poorly, only achieving a 10% mode shift at 2048 for the Frankton fast ferry, relying on a bus based network to deliver most of the mode shift.

Enables enhanced land use

Do Min has lowest TOD potential simply because it's the least change. **Bus Max** and **Trackless Tram** have highest TOD potential **on current zoning** as there is wide distribution of stops – lots of lower-rise development but dispersed, not concentrated. **Gondola** could have TOD potential at hubs but not significant **on current zoning**. **Ferry** has low potential at Frankton Beach due to zoning and airport restrictions.

Is adaptable to change and disruption

On road options are significantly less resilient than gondola or ferry. The on-road options are vulnerable to short term hazards such as snow and ice and slips, flooding and low-probability seismic events. Ferry may be impacted by weather a few days of the year.

Reliability

On-road options are heavily dependent on the amount (and location) of priority to ensure that they are reliable. Gondola and Ferry are more likely to provide close to 100% reliability. The Frankton Arm is challenging water space for a catamaran and wind may impact the gondola a few days of the year.

End to end Journey Times

2048 AM Peak Travel Times to Queenstown Town Centre			
Option	> Frankton	> Lake Hayes Estate	> Jacks Point
Do minimum	21	39	55
Bus Max	17	27	31
Trackless Tram (base)	23	35	61
Trackless Tram Max	17	27	31
Gondola*	22	44	58
Ferry	15	35	49
Car**	14-16	26-35	40-49
* Updated evidence of gondola having similar travel times to Bus Max and Trackless Tram Max			
** Car travel times vary by degree of mode shift delivered by each mode.			

Operating Cost (OPEX)

Queenstown PT network options opex (per annum)							
Option	Total opex	QTC (MRT)	QTC (Bus)	SH6A (MRT)	SH6A (Bus)	Rest of Network (MRT)	Rest of network (Bus)
Bus Max	\$12,823,050	\$717,337	-	\$3,217,533	\$0.00	\$6,794,568	\$2,093,611
Trackless Tram	\$11,582,130	\$440,395	\$153,692	\$2,443,143	\$0.00	\$1,944,008	\$6,600,891
Gondola	\$18,888,037	-	\$304,576	\$4,900,000	\$1,013,492	\$3,700,000	\$8,766,917
Ferry	\$36,195,841	-	\$507,628	\$27,400,000	\$1,013,492	-	\$7,274,721
Do-min	\$4,726,088	-	\$407,946	-	\$1,234,900	-	\$3,083,242

Enhances the liveability and quality of the natural & built environment

Resident/ Visitor Experience. **Do Min** reinforces car dependency and retains the negative amenity effects of traffic congestion. **Bus Max** could have issues with bus platooning in the town centre if there isn't extensive priority on SH6A but otherwise is a promising option in the short to medium term. **Trackless tram** could avoid the town centre and fit better in its urban context. **Gondola** could be both a negative (privacy; breaking Queenstown Hill Outstanding Natural Landscape and recreational user experience) and a positive (exceptional arrival experience and passenger experience). **Ferry** has negative impacts through the scale of land-side infrastructure but is highly regarded from a customer experience point of view and fits well with Queenstown's visitor offering.

Environment. **Do Min** & **Ferry** both have least mode share and the most significant fossil fuel motive power impact (at least in the short term). **Ferry** could require significant reclamation at Frankton Beach due to shallow water. **Gondola** is electric as are **Bus Max** & **Trackless Tram** options. Visual impacts most notable with the **Gondola**. **Bus Max** and **Trackless Tram** (esp. Max) achieve significant mode shift with **Trackless Tram Max** performing best of all.

Enhances Safety with a goal of Vision Zero

The level of mode shift and reduction in Vehicle Kilometres Travelled proxies change in exposure for all road user groups (although there is some shift in exposure – e.g. from car driver to pedestrian/ public transport customer). Added signalised intersections are likely to improve safety for all modes. But sometimes more congestion can equal slower travel speeds and more but less severe crashes. It's hard to differentiate between modes – **Gondola** and **Ferry** may be safer as they are off corridor options.

Multi-criteria Analysis

Using the evidence base summarised above, the project team carried out a Multi-Criteria Analysis (MCA) which was presented at a workshop on 2nd August 2019 with the client team; agreed to and adopted largely unaltered. The Network Options MCA is below:

Public Transport Network Options Multi-criteria Analysis						
	Do Min	Bus Max	Trackless Tram	Trackless Tram Max	Gondola	Ferry
Can Achieve significant mode shift	1	2	2	3	2	1
Sustainably manage growth	-3	3	2	3	3	1
Resilience - Network Events	0	1	0	1	3	2
Resilience - Natural Hazards	-1	0	-1	-1	1	2
Reliability	-2	3	1	3	3	3
End to end journey time	-1	3	2	3	2	1
Towards Vision Zero	0	2	1	2	3	3
Modal Integration	1	3	2	2	1	-2
	Do Min	Bus Max	Trackless Tram	Trackless Tram Max	Gondola	Ferry
Operational Flexibility	-1	2	0	2	0	2
Affordable (capex)	2	-2	-1	-3	-2	0
Affordable (opex)	3	2	3	3	1	-2
Resident/Visitor experience	-2	1	2	3	1	1
Urban design and development	-3	3	2	3	1	0
Environmental Impact	-3	1	1	1	2	-3
Access for local communities	-2	3	2	2	1	-1
Construction impacts	3	-1	-3	-2	3	3
Alignment with Masterplan and spatial plan	-3	1	1	2	3	-1

As a result of the MCA, it was agreed that the Do Minimum and Ferry options could be dropped from further consideration as it was clear that from the evidence and scoring that Do Minimum unsurprisingly does not achieve the desired outcomes and the Ferry option had both high costs; significant issues; attracted very limited patronage and scored poorly against the investment objectives. This is not to say

that ferries will not have a role in the future network, but they will not form the core part of the high capacity network.

One of the challenges moving forward is that full public transport priority was identified as being needed to deliver the best outcomes from the on-road HCPT options but that this was likely to be both unaffordable and to have unacceptable impacts. A need to look at intermediate options with partial priority on State Highway 6A was identified to see if there was an option that could balance cost; impacts; public transport reliability and overall transport system performance. This work was presented at the technical workshop with the client group on September 18th, 2019. This involved largely virtual priority on State Highway 6A with much more extensive bus priority on the two branches of State Highway 6.

Network Development Pathway

Option refinement

As a result of this MCA, the remaining network options were simplified into High-Capacity Public Transport (HCPT) and Gondola options. The HCPT option simply recognised that trackless tram was a logical evolution in terms of capacity and quality from the bus max option, recognising that it makes sense to make best use of conventional bus options, which can be implemented under the current Public Transport Operating Model (PTOM), in the short to medium term.

The Gondola option is largely as previously described but an opportunity exists to extend this to Queenstown Airport and for it to be integrated into a broader network proposed by Remarkables Park Limited.

The bus max option has undergone a couple of refinements:

1. The Queenstown to Ladies Mile/ Lake Hayes Estate had previously split into two at the Stalker Road roundabout. This has been simplified to a single route via Shotover Country and Lake Hayes Estate before terminating at the corner of Frankton – Ladies Mile Highway and Howard Drive. The size of the Ladies Mile development would mean that the entire development would be within walking distance of the highway, meaning that having a service penetrating the development would add little value but would halve the frequency provided to Shotover Country and Lake Hayes Estate.
2. The Queenstown Hill Connector has been dropped because the streets on the hill are unsuitable for conventional public transport operation. In addition, it would take up capacity at the Queenstown Town Centre hub which would reduce the longevity of the bus max option which needs the capacity provided by the hub to ensure reliable service. We recommend investigation of an on-demand service model for this area.

The Gondola option has also undergone some minor refinement:

1. The bus feeder network now hubs around the Frankton Hub where the connection to the gondola to Queenstown Town Centre would take place, making the gondola network a true hub and spoke network.
2. The Frankton to Ladies Mile/ Lake Hayes Estate had previously split into two at the Stalker Road roundabout. This has been simplified to a single route via Shotover Country and Lake Hayes Estate before terminating at the corner of Frankton – Ladies Mile Highway and Howard Drive. The size of the Ladies Mile development would mean that the entire development would be within walking distance of the highway, meaning that having a service penetrating the development would add little value but would halve the frequency provided to Shotover Country and Lake Hayes Estate.
3. The Queenstown Hill Connector has been dropped because the streets on the hill are unsuitable for conventional public transport operation. In addition, it would take up capacity at the Queenstown Town Centre hub which would reduce the longevity of the bus max option which needs the capacity provided by the hub to ensure reliable service. We recommend investigation of an on-demand service model for this area.

The ultimate service levels proposed in these options are:

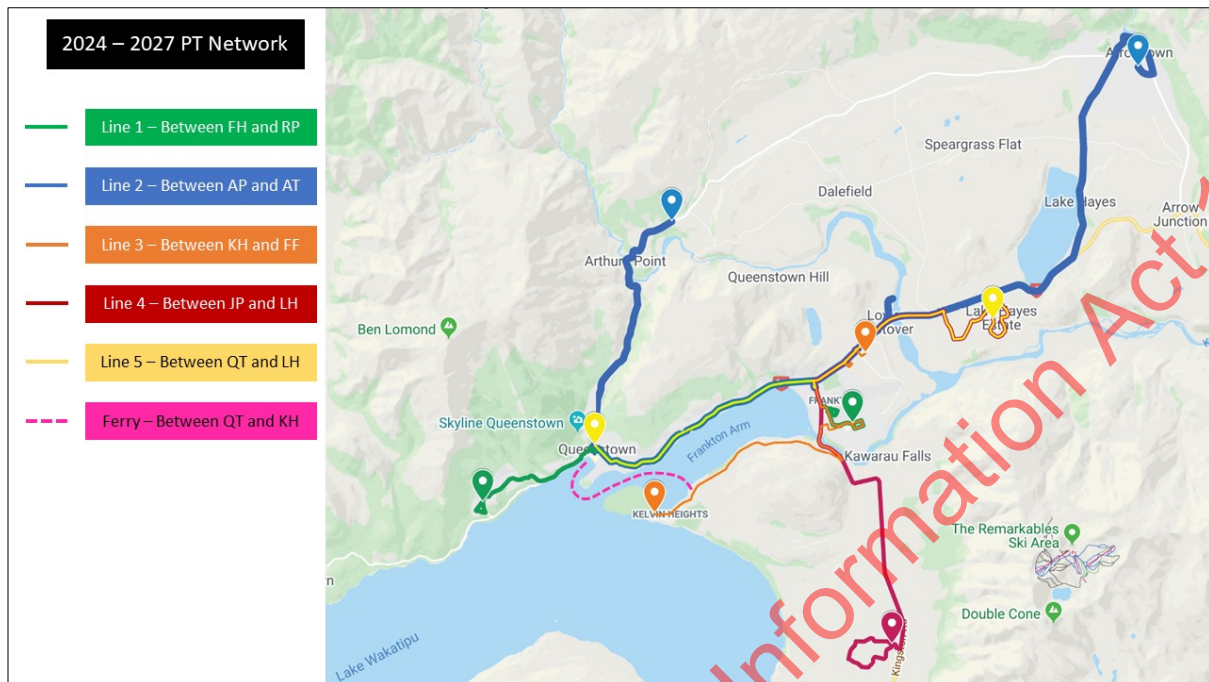
Gondola frequency table (in mins)	Peak	Non-peak	Overnight
1. Gondola	30 sec	30 sec	
1. Queenstown TC to Frankton Hub Frankton Hub to Queenstown TC	10	15	15
3. Frankton Hub to Jacks Point Jacks Point to Frankton Hub	10	15	30
2. Frankton Hub to Arrowtown Arrowtown to Frankton Hub	10	15	30
4. Kelvin Heights to Quail Rise Quail Rise to Kelvin Heights	15	15	30
8. Frankton Hub to Ladies Mile via Lake Hayes Ladies Mile to Frankton Hub via Lake Hayes	10	15	30
7. Fernhill to Arthurs Point Arthurs Point to Fernhill	15	15	30
5. Frankton Loop	15	15	
6. Kelvin Heights Ferry	15	15	

Bus Max frequency table (in mins)	Peak	Non-peak	Overnight
1. Fernhill to Lake Hayes Estate Lake Hayes Estate to Fernhill	10	15	30
2. Arthurs Point to Arrowtown Arrowtown to Arthurs Point	10	15	30
4. Kelvin Heights to Quail Rise Quail Rise to Kelvin Heights	15	15	30
3. Queenstown TC to Jacks Point Jacks Point to Queenstown TC	10	15	30
5. Frankton Loop	15	15	
6. Kelvin Heights Ferry	15	15	

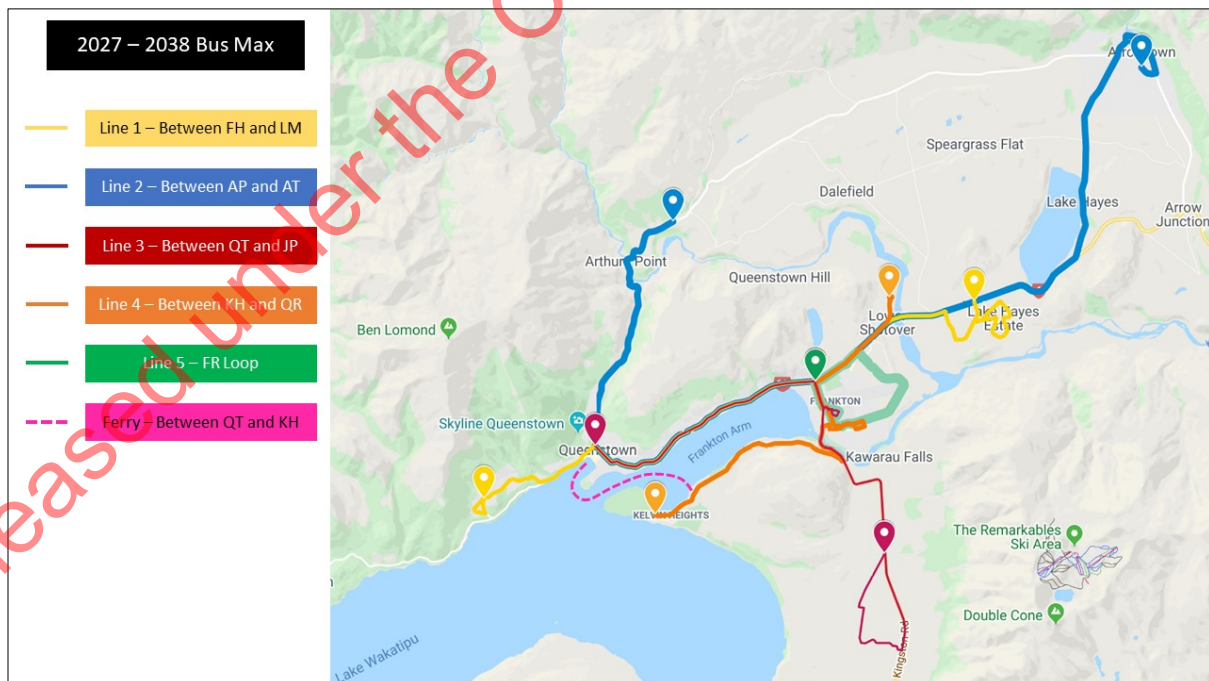
Service Development Pathway

The next step was to identify a staged pathway to meet modelled demand to build from the current level of bus service on SH6A (8 buses per hour in the peak direction able to carry 300 passengers) towards the point at which the Bus Max model reaches its maximum capacity around the mid-2030s, based on current modelling, at 1,800 passengers per hour.

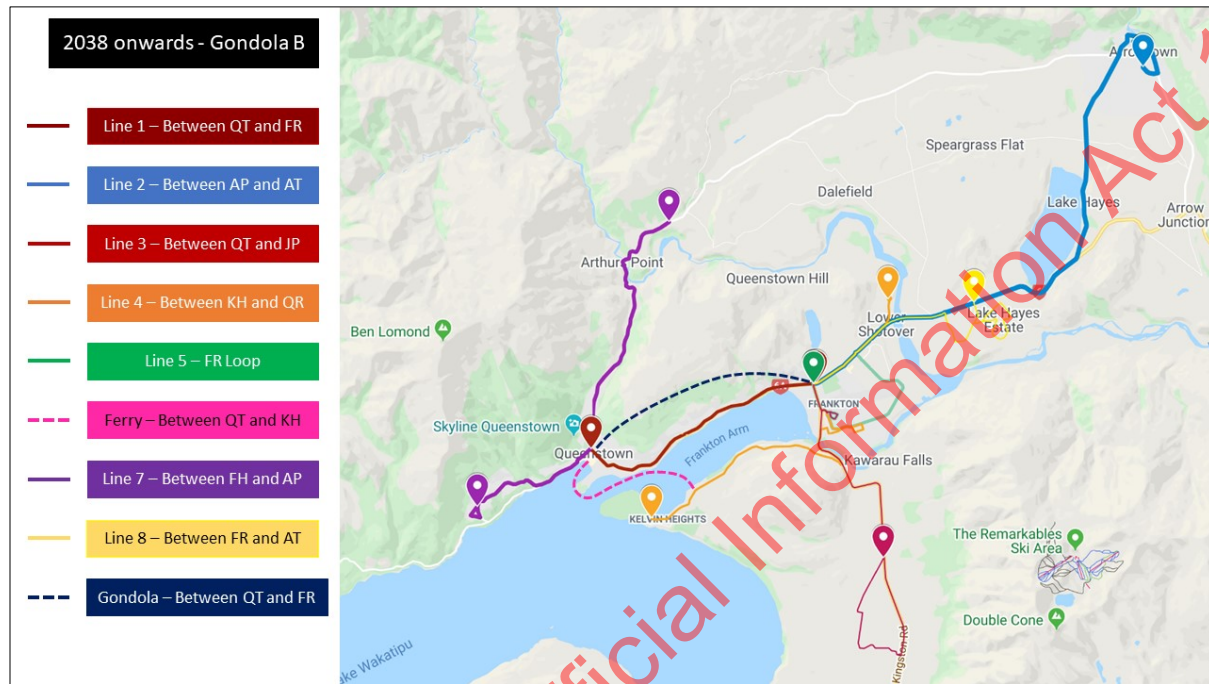
During the period of the current PTOM contract, which lasts under 2027, we propose that services would be built up on the current service network, with increased frequencies using the existing bus fleet until 2024, when the spine route 1 would need to be partially or fully converted to double-decker operation and its peak frequency increased to every 10 minutes.



Between 2027 and 2038, Bus Max would be introduced in two stages, with the second stage reaching the service levels in the table above. Its ultimate capacity is 1,800 passengers per hour/direction made up of three core services each operating every 10 minutes, meaning a 3-3-4-minute service frequency on SH6A. Some banker buses could be used to get to 2,200 passengers/ hour/ peak direction, but there would be a high cost to this as those buses would only be required for a few hours a day.



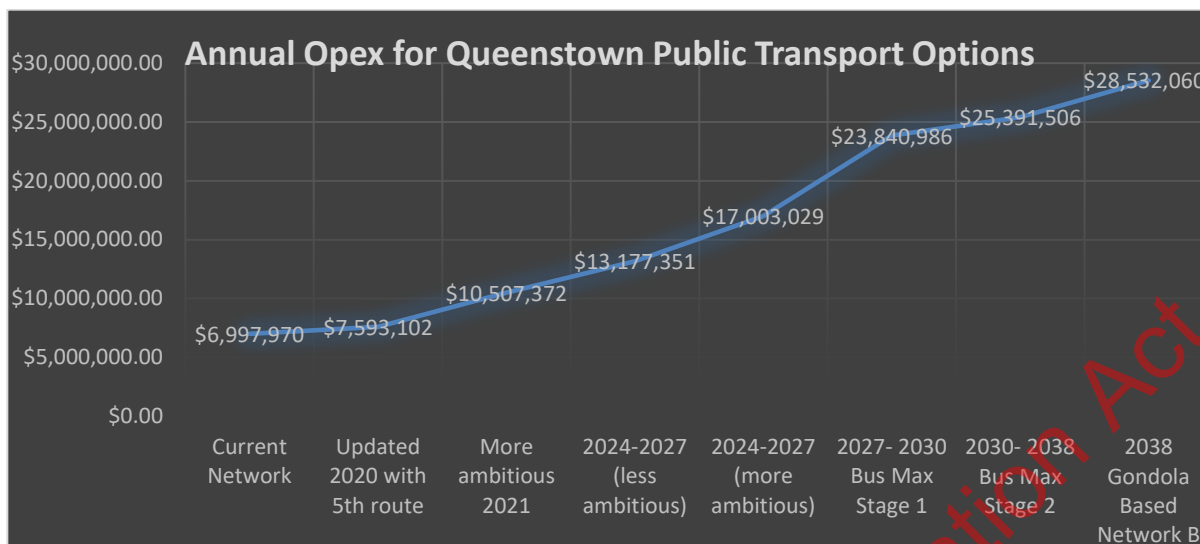
Bus Max would run out of capacity to meet the modelled public transport demand by 2038 at the latest, noting that it would start to struggle to meet demand in the last few years. This means that 2038 would be the final date for the next step change in public transport capacity to be delivered. We consider that the gondola option is the best option at this point, simply because it is completely independent of the road network on State Highway 6A, provides hyper-frequency (every 30 seconds and possibly even less than this) and is fairly resilient to disruption, and provides for increased capacity.



Note that there might be a range of circumstances in which consideration should be given to advancing the Gondola option. These include:

- Where it is not possible to achieve the level of bus priority on state highways 6 and 6A to make these options reliable and fast enough to attract sufficient customers.
- Where the capex and opex expenditure required to deliver the Bus Max option is not forthcoming.
- Demand rises faster than currently modelled meaning that the Bus Max option runs out of capacity earlier than expected.
- A PPP arrangement takes place in which the public sector funds the decongestion and other transport benefits of the Gondola, capping the exposure of the public sector by funding outcomes (as in people moved), capped by the actual capacity of the gondola.

The opex implications of the bus max and gondola options are as per the graph below.



A couple of notes on the opex implications:

- These are gross costs of operating the services.
- Farebox revenue would be netted off these costs. The current Queenstown farebox recovery ratio is around 70%, the highest in New Zealand.
- Capital costs are excluded. The Bus Max fleet cost is estimated at \$46 million (including a 12% fleet spares ratio) and a suitably-sized depot would need to be provided. The Gondola option has a capex estimate of \$134.83 million for Queenstown to Frankton.
- All numbers in the table above are for Bus Max except 2038 which include an annual gondola opex estimate of \$4.9 million for Queenstown to Frankton.
- The hub location at Frankton would be required to support both bus max and gondola options while the Queenstown hub is largely required for the bus max option. The gondola operation has relatively limited need for bus connectivity in Queenstown which could be incorporated into the gondola hub itself.

Conclusion

The results of the analysis to date demonstrates that with extensive bus priority and a major upgrade of hubs in Queenstown and Frankton, a high-capacity on-road bus-based public transport network can provide sufficient capacity to meet demand for around 15-18 years. But this capacity is finite and there is risk that should public transport demand grow faster than that modelled, this capacity could be exhausted sooner than expected.

At the same time, the gondola exists as a potential option which would deliver a journey experience fitting for a year-round resort of global repute which providing very high reliability, frequency and resilience.

While the Bus Max option can be delivered under the existing Public Transport Operating Model, the gondola option presents an opportunity for a public private partnership where the public sector limits its liability to funding actual benefits to actual members of the public on a outcome based model which would inevitably be capped at the capacity of the gondola itself.

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Appendix B7 Technical Note 18: Queenstown Lakeview Bus Service Analysis

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NZTA Contract 2018235 - F2Q SSBC & QTC DBC

Technical Note # 18

29 October 2019

Queenstown Lakeview Bus Service Analysis

Introduction

This memo looks at the feasibility of providing bus service to the Lakeview development in Queenstown in response to questions raised by Queenstown Lakes District Council (QLDC) staff.

Lakeview

In July 2016, the Lakeview land (see map below) was rezoned from High Density Residential to Queenstown Town Centre (under Plan Change 50) to enable the expansion of the town centre to accommodate high rates of population growth beyond the capacity of the existing town centre.

In October 2019, Queenstown Lakes District Council (QLDC) signed a development agreement with Ninety-Four Feet and Augusta Capital for development on the Lakeview land.

Through this partnership and others with Ngāi Tahu Tourism and Well Smart Limited, the Lakeview Precinct will include residential buildings, hotels, co-working and co-living spaces, hospitality and retail, and a hot pools attraction. Construction will be phased over seven stages and is estimated to take more than ten years to complete.



Lakeview Development Area (Source: QLDC).

Bus Options to Lakeview

The original planning for the Lakeview was on the basis that the growth could be accommodated within the current form and scale of roading – albeit with the addition of the Thompson Street s-curves easing and Isle Street extensions. This work recognised that an arterial option may emerge in the future but did not require this to service the development.

The Integrated Transport Assessment for Lakeview described the then current bus routes and referred to them providing for an adequate level of public transport service to the Lakeview development. These bus routes form part of the current and future planned bus network via Stanley Street, Shotover Street and Lake Esplanade.

In the current roading context, it is not possible to operate buses into Lakeview because there is no way to turn a bus around. This is because Thompson Street ends up in a cul-de-sac and there is no other current feasible bus turnaround location.

This issue could be overcome if all three stages of the town centre arterials were to proceed, including the stage 3 Thompson Street extension to the One Mile Roundabout. But a key aim of the arterials, as envisaged in the Queenstown Town Centre Masterplan, was to provide a traffic bypass of the town centre to enable Stanley Street, Shotover Street and Lake Esplanade to become more pedestrian- and cycle-friendly and to facilitate bus priority via those streets through the Queenstown Town Centre.

So even if all three stages of the arterials were to proceed, it would still make sense to run buses via Shotover Street and Lake Esplanade simply because the traffic would have diverted to the arterials. Running buses via the arterials would have them mixed with general traffic which risks reliability, a key feature sought by public transport customers, while a route via Stanley Street, Shotover Street and Lake Esplanade provides excellent service to the whole of the historic core of the Queenstown Town Centre and the large hotels on Lake Esplanade. Of note is that Lakeview in its entirety is in walking distance from the town centre with no part of Lakeview more than 420 metres from either Lake Esplanade or Shotover Street. We acknowledge that the gradient between the town centre and Lakeview is a challenge in the uphill direction, but this issue is not unique to Lakeview. For example, parts of Queenstown Hill with very high walk mode share to/ from the town centre have similar gradient issues.

An alternative mechanism to service Lakeview directly by public transport would be to provide a feeder service using smaller vehicles connecting to the main Queenstown town centre bus hub (this could be provided by on-demand or autonomous vehicles in the future, as technology permits). Due to the short distances involved this is considered unlikely to be viable however it has not been precluded.

Conclusion

Our view is that most trips from Lakeview to and from the town centre will be by foot with vehicular access available for taxis (including Total Mobility subsidised trips for people with significant mobility challenges), Uber, rental cars and private vehicles. Public transport services will be within walking distance on the lakefront and through the historic core. We believe that the core network as currently operated and in our thinking for the future should continue to follow this route which provides the best balance between serving the historic core and lakefront and the forthcoming Lakeview development.

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