



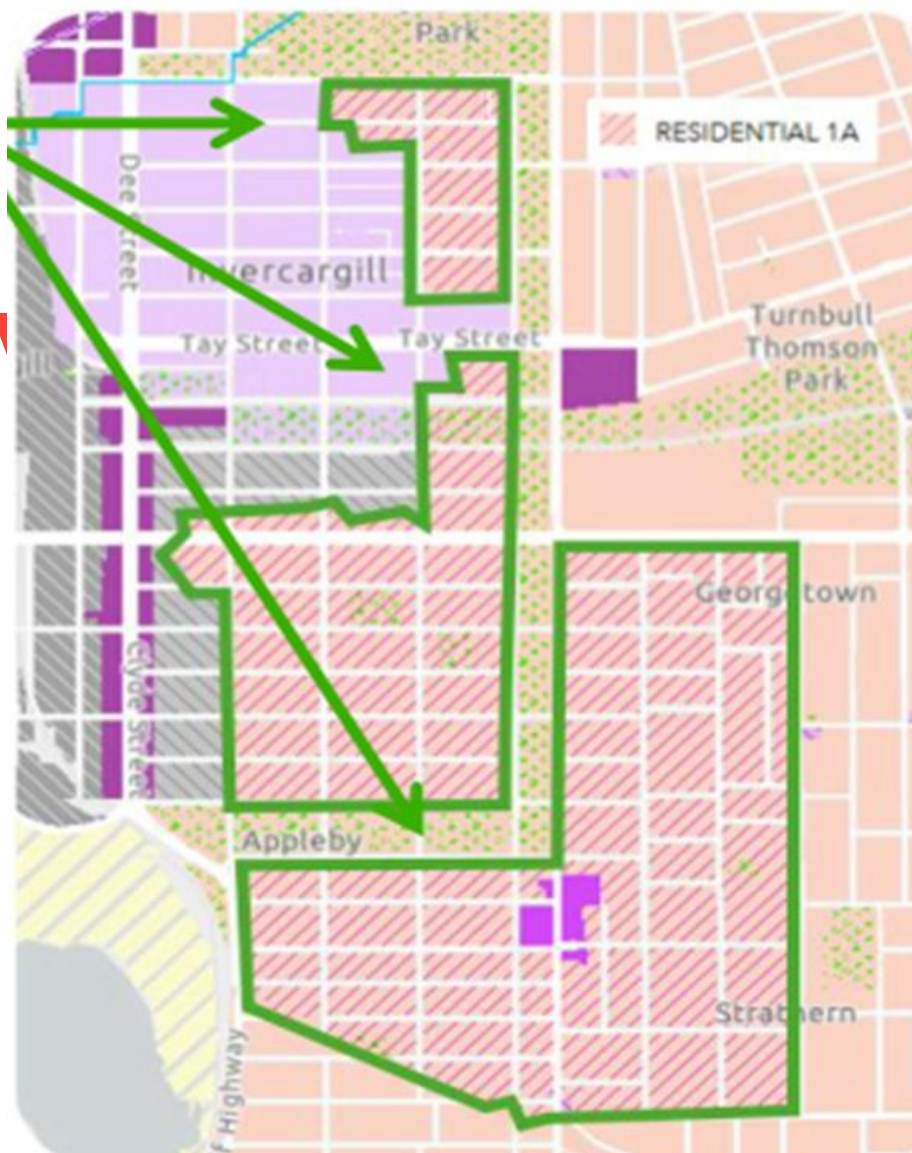
ICC

Invercargill City Council **Transport Assessment**

Proposed Housing and Code of Practice Plan Change

27 September 2025

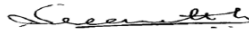
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Transport Assessment
Proposed Housing and Code of Practice Plan Change
Invercargill City Council

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2	8/8/25	Updated based on ICC feedback
3	27/9/25	Updated based on Planning Feedback

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This report ('Report') has been prepared by WSP exclusively for Invercargill City Council ('Client') in relation to Residential Zoning Change ('Purpose') and in accordance with the C1115 Professional Services for Transport. The findings in this Report are based on and are subject to the assumptions specified in the Report and CBN29. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.





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ABBREVIATIONS

Vph	Vehicles per hour
Vpd	Vehicles per day
ADT	Average Daily Traffic
MRU	Minor Residential Units

EXECUTIVE SUMMARY

Project Background and Zone Changes

The Housing and Code of Practice Plan Change seeks to increase housing density and diversity in Waihōpai Invercargill. Key amendments include reducing minimum lot sizes in Residential 1A (Medium Density) Zone from 400m² to 300m² as permitted, with options for higher density under restricted discretionary or discretionary activities. The Residential 1 Zone retains a 400m² minimum but modifies activity statuses for densities between 350m² and 400m². Additionally, the report recommends removing references to an expired bylaw to decouple the Code of Practice from the District Plan.

Information and Data Sources

The assessment relies on various documents provided by the client, including district plan reviews, engineering memos, and housing capacity evaluations. Traffic counts and road widths were obtained from Mobile Road/RAMM databases, with peak hour traffic estimated at 10% of average daily traffic (ADT) due to lack of specific traffic surveys or modelling.

1 Housing Capacity Scenarios

Three scenarios were modelled to assess residential capacity for RES1A under current and proposed planning settings:

Scenario	Existing Dwellings	Feasible Capacity	Net Capacity (Additional Dwellings)	Projected Dwellings per HA
1. Status Quo	2,901	3,147	246	19.8
2. Proposed Plan Change	2,901	4,591	1,690	28.9
3. Proposed Plan Change + MRUs	2,901	4,844	1,943	30.4

Table -Information sourced from ICC House Sufficiency and Monitoring Report

The inclusion of Minor Residential Units (MRUs), or "granny flats," as permitted activities further increases feasible capacity.

Existing Road Networks and Classifications

The assessment focuses on three areas with typical Invercargill grid road patterns:

Area 1: Gala Street – Doon Street and Esk Street Block

- Roads include arterials (Gala Street, Yarrow Street), primary and secondary collectors.
- Gala Street is a major east-west arterial with high traffic volumes (ADT ~17,941) and significant pedestrian and cyclist activity due to proximity to Queens Park.
- Roads have widths around 13.4m to 14m with on-street parking on both sides.

Area 2: Ness Street, Nith Street, and Balmoral Drive

- Includes regional State Highway (Tay Street), arterials, secondary collectors, and access roads.
- Roads vary from 6.8m to 18m wide.
- Ness Street, though classified as access, carries significant traffic.

- Key north-south routes include Ness Street and Conon Street, with Conon Street as a primary collector connecting Tweed Street to Balmoral Drive.

Area 3: Pomona Street, Tramway Street, Tweed Street, Elles Road, Dalrymple Street, and Nith Street

- Contains arterials, primary and secondary collectors, and access roads.
- Roads range from 9.2m to 14.5m wide.
- Major arterials include Tweed Street and Elles Road with high ADT volumes (16,019 and 13,904 respectively).
- Grid pattern connects primary and secondary collectors with residential access roads.
- Area subdivided into west and east of Elles Road for traffic assessment.

Public Transport and Active Modes

- All three areas are served by Invercargill City Buses with routes passing through key streets like Yarrow Street (Area 1), Conon Street (Area 2), and multiple roads in Area 3.
- Cycling infrastructure includes marked cycle lanes on Conon Street (Area 2) and Conon and Ness Streets (Area 3 west of Elles Road). Tramway Road and Tweed Street has cycle lanes (Area 3 east of Elles Road).
- Footpaths are present on both sides of roads throughout all areas, with roads wide enough to accommodate cyclists even where dedicated lanes are absent.

Traffic Generation and Impact Assessment

Traffic generation estimates are based on net additional dwellings per scenario, distributed proportionally by area size, with vehicle trip rates varying by suburban classification:

Area	Approx. Area (HA)	Scenario 1 Additional Dwellings	Scenario 2 Additional Dwellings	Scenario 3 Additional Dwellings
1	9.9	15 (163.5 vpd; 18vph)	107 (1,145 vpd; 126vph)	124 (1,260 vpd; 140vph)
2	48.7	76 (625 vpd; 69vph)	524 (4,296 vpd; 471vph)	602 (4,826 vpd; 533vph)
3	100.5	155 (1,271 vpd; 139vph)	1,065 (8,730 vpd; 958vph)	1,224 (9,811 vpd; 1,085vph)

(vpd = vehicles per day, vph = vehicles per hour).

Area 1 Traffic Impact

- Peak hour traffic increases by 149vph.
- Major roads (Gala Street, Yarrow Street) will see additional 50vph each.
- Existing road network grid offers multiple routing options.
- Gala Street is already near capacity existing peak hour traffic is 850vph/lane (Capacity as per Austroads is 900vph/lane); additional traffic may increase delays and reduce level of service, especially at priority-controlled intersections like Doon Street/Gala Street and Jed Street/Gala Street.

Area 2 Traffic Impact

- Peak hour traffic increases up by 542vph.

- Key north-south roads such as Conon Street, Ness Street, and Ythan Street expected to carry most additional traffic.
- East - west traffic on Ettrick Street and Crinan Street connecting SH1 to Elles Road.
- Existing network can accommodate traffic, but increased delays anticipated, especially for right-turning vehicles at intersections like Ettrick/Conon Street, Crinan/Conon Street, and Ness/Ettrick Street.

Area 3 Traffic Impact

- Peak hour traffic increases by 1,102vph.
- Traffic distributed 30% west and 70% east of Elles Road.
- Major arterials Tweed Street and Elles Road will carry significant additional traffic (600vph and 300vph respectively).
- Increased traffic expected to cause delays at intersections such as Pomona Street/Tweed Street and Tramway Road/Elles Road,
- The Elles Road and Tweed Street roundabout may experience increased delays; further modelling is recommended.
- No opportunity for vehicles to cross Elles Road between Tweed Street and Martin Street; assessment needed for potential upgrades at Crinan Street.

Parking Considerations

- Area 1 roads are wide (13.6m to 14m) with on-street parking on both sides; increased delays may require extending no-parking zones to accommodate queues.
- Area 2 roads mostly have on-street parking on both sides, except Tyne Street (6.8m wide) with parking on one side.
- Area 3 includes narrower streets (Janet Street and Martin Street and various residential streets, 9.2m wide) where parked cars on both sides could hinder vehicle passage, necessitating potential parking restrictions.
- If new dwellings do not provide off-street parking (assuming one park per dwelling), this will add significant on-street parking demand across all areas, potentially exacerbating parking issues.

Area	Additional Car Parks (Scenario 3)
Area 1	149
Area 2	542
Area 3	1,102

Conclusions

The proposed residential zone changes will significantly increase housing capacity and traffic volumes across the three areas assessed. While the existing road networks have capacity to absorb additional traffic, some arterials and key intersections are near or at capacity and will experience increased delays, particularly at priority-controlled and give-way intersections. The additional capacity and growth in traffic is expected to be realised long term in 25 to 30 years.

Future Upgrades

The impacts will be gradual. The intersections and road network to be modelled and monitored to assess the trigger points for any future upgrades required to the road network. This will provide the council the data to

develop a long-term plan to mitigate effects and improve the level of service. Enhancing public transport routes and cycling infrastructure will support sustainable transport alternatives.

1 PROJECT BACKGROUND

1.1 ZONE CHANGES

The Housing and Code of Practice Plan Change is being developed to enable greater density and diversity of housing choice in Waihōpai Invercargill, and decouple the Code of Practice for Land Development and Subdivision Infrastructure from the District Plan. This report recommends the following preferred approach:

Enable Housing Density and Diversity

Amend the Residential 1A (Medium Density) Zone policies and rules:

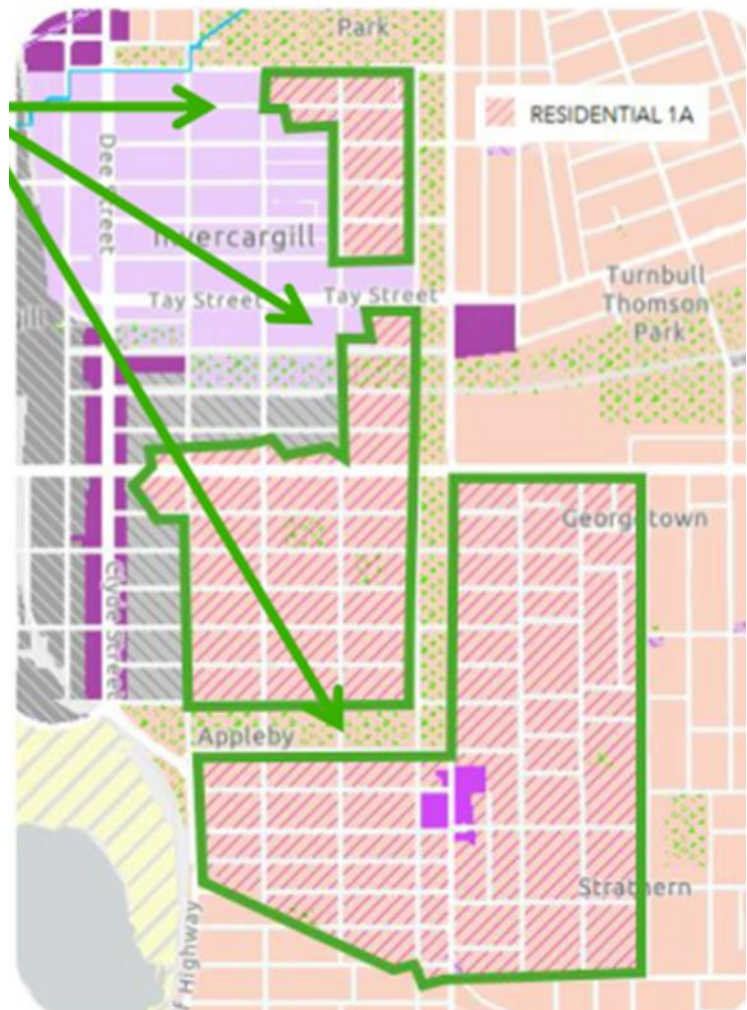
- Change the permitted housing density from 400m² to 300m²
- Enable density to 200m² as a restricted discretionary activity¹(public notification precluded)
- >200m² to be a discretionary activity
- New standards would apply for setbacks, coverage, open space, outlook, glazing etc

Amend the Residential 1 Zone policies and rules:

- Retain 400m² minimum permitted density
- Change density between 350m² and 400m² from discretionary to be a restricted discretionary activity (public notification precluded)
- Change >350m² from non-complying to be a discretionary activity

Code of Practice

Decouple the Code of Practice for Land Development and Subdivision Infrastructure from the District Plan by removing references to the expired bylaw.



2 INFO / DATA PROVIDED TO THE CONSULTANT

2.1 PROPOSAL DOCUMENTS

The list of documents provided by the client are follows.

- 1) District Plan Review Fact Sheet
 - 2) Engineering Memo for Plan Change
 - 3) ICC Feasible Development Capacity Preliminary Evaluation
 - 4) Housing and Code of Practice – Options and Preferred Approach Report.
 - 5) ICC Housing and Monitoring Report
-

2.2 INFORMATION USED

1. The Traffic counts were from Mobile Road / RAMM.
 2. The road widths were from Mobile Road / RAMM
 3. There has been no modelling or traffic surveys completed for this assessment.
 4. Since there has been no traffic surveys completed, we have assumed the peak hour traffic to be 10% of the Average Daily Traffic (ADT)
-

2.3 ICC HOUSING SUFFICIENCY AND MONITORING REPORT

As per the ICC Housing and Monitoring Report, the following three scenarios have been modelled to assess capacity available under both operative and proposed planning settings.

(A) SCENARIO 1

Status Quo: Reflecting the operative District Plan with current bulk, location and density provisions.

(B) SCENARIO 2

Proposed Plan Change: Incorporating proposed amendments to minimum lot sizes and activity statuses within the RES1 and RES1A zones.

(C) SCENARIO 3

Proposed Plan Change + Minor Residential Units (MRUs): This scenario builds on Scenario 2 by incorporating indicative assumptions from the central government's proposed National Environmental Standards (NES) for Minor Residential Units, commonly referred to as "granny flats.". Under this scenario, one MRU per lot is assumed to be enabled as a permitted activity, provided the unit meets the relevant criteria. These include a maximum internal floor area of 70 square metres, a combined site coverage limits of 50% for both the MRU and the principal residential dwelling, and a minimum 2-metre setback from all parcel boundaries and any existing buildings on the site. MRUs must remain in common ownership with the main dwelling and are not subject to additional requirements relating to outdoor space, car parking, or glazing standards.

Rule	Zone	Scenario 1 Current District Plan	Scenario 2 Proposed Plan Change	Scenario 3 Proposed Plan Change + MRUs
Permitted Activity Threshold (m ²)	Residential 1	400	400	400
	Residential 1A	400	300	300
Restricted Discretionary Threshold (m ²)	Residential 1	--	350	350
	Residential 1A	--	200	200
Discretionary Activity Threshold (m ²)	Residential 1	350	250	250
	Residential 1A	350	150	150
Min. Contiguous Requirement (m ²) for Medium Density	Residential 1A	2,000 (Disc.)	--	--
Proposed Granny Flat Rules	Modelled in Residential 1A and 1 Zones	--	--	Yes (assumed at 60m ² per MRU)

Figure 1: Scenario Definition, Changes from Baseline are highlighted in orange. (From the ICC Housing Sufficiency and Monitoring Report)

The below table summarises the capacity for the Residential 1A

Scenario	Zone and Lot Classification	Land Area (HA)	Existing Dwellings	Plan-Enabled Capacity	Infrastructure Enabled Capacity	Feasible Capacity	Current % Achieved	Projected % Achieved	Projected Dwellings per HA	Net Capacity
1 Status Quo	Residential 1A	159.1	2,901	4,083	4,075	3,147	71%	77%	19.8	246
2 Proposed Plan Change	Residential 1A	159.1	2,901	6,079	6,071	4,591	48%	76%	28.9	1,690
3 Proposed Plan Change + MRUs	Residential 1A	159.1	2,901	7,487	7,480	4,844	39%	65%	30.4	1,943

TABLE 1 – NET CAPACITY ANALYSIS (PROVIDED BY ICC HOUSING SUFFICIENCY AND MONITORING REPORT)

3 EXISTING ROAD NETWORK

The proposed changes are for three areas, area 1, area 2 and area 3 as listed below. Existing road characteristics and classifications of the road network for each area is provided in the below section.

3.1 AREA 1

Gala Street – Doon Street and Esk Street Block

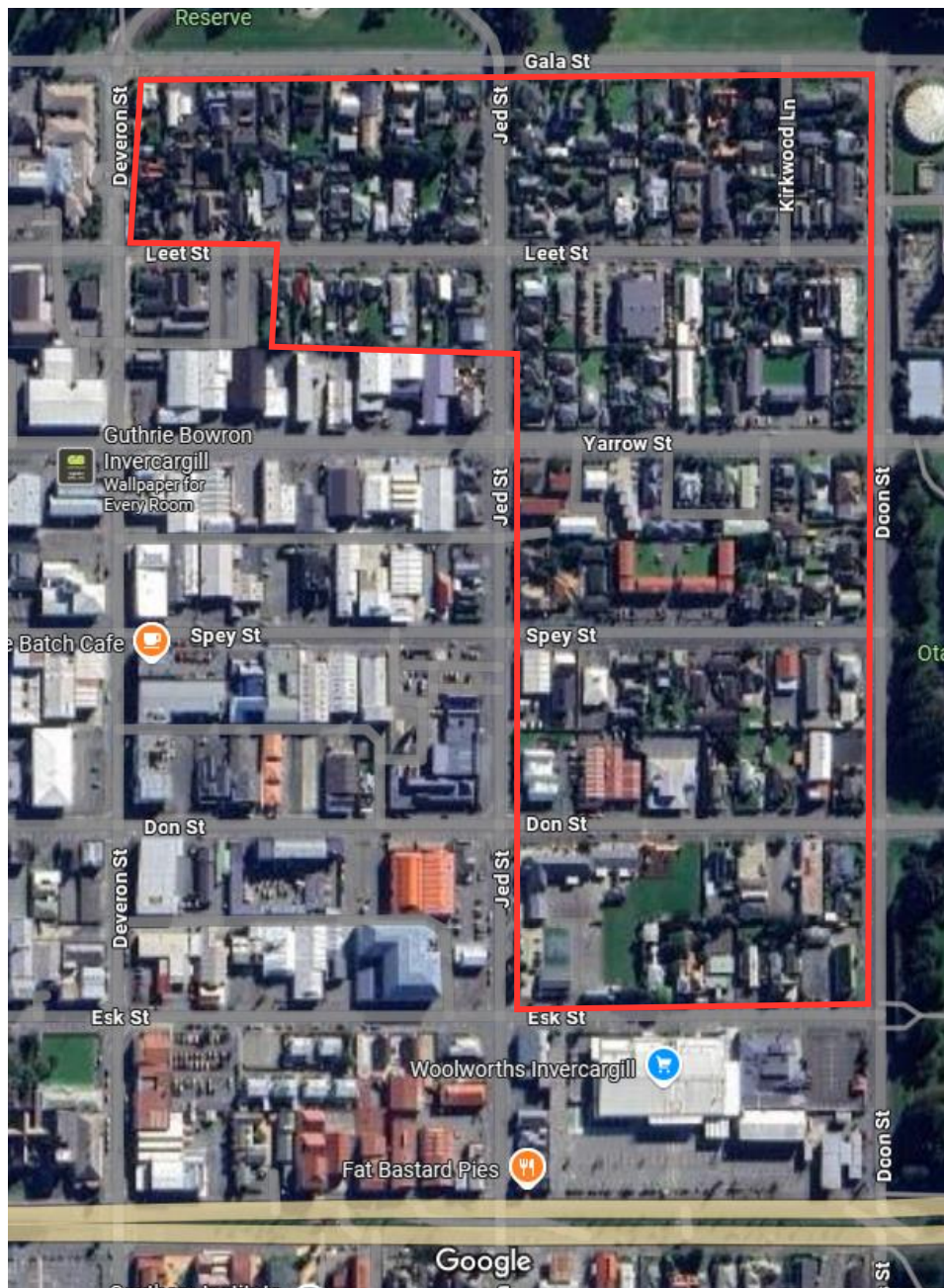


Figure2: Aerial view of Area 1.

3.1.1 ROAD NETWORK

The area 1 is made up of roads in a grid pattern which is typical for Invercargill City. Below is the list of roads with their functions and geometry.

Street/Road	Classification	ADT (vehicles per day)	Width	Current Peak hour (10% of VPD)
Gala Street	Arterial	17,941	14m	1,700
Yarrow Street	Arterial	7,214	13.6m	720
Don Street	Primary Collector	3,569	13.8m	356
Leet Street	Secondary Collector	624	13.6m	100
Spey Street	Secondary Collector	4,328	14m	432
Esk Street	Secondary Collector	2,621	13.4m	262
Doon Street	Secondary Collector	1,037	13.6m	103
Jed Street	Secondary Collector	5,105	13.6m	510

TABLE 2: LIST OF ROADS FOR AREA 1

The road network is made of higher category roads such as Arterials, Primary and Secondary Collectors. Close to the city centre, area 1 is bound by major arterials. There is also a high level of parking on these streets due to the proximity to the CBD and pocket of businesses.

There is substantial traffic on Gala Street currently as it forms the main arterial, running east-west connecting Queens Drive to State Highway 6. Gala Street also attracts a lot of pedestrians and cyclists as it provides frontage to the Queens Park.

3.2 AREA 2

Ness Street, Nith Street and Balmoral Drive

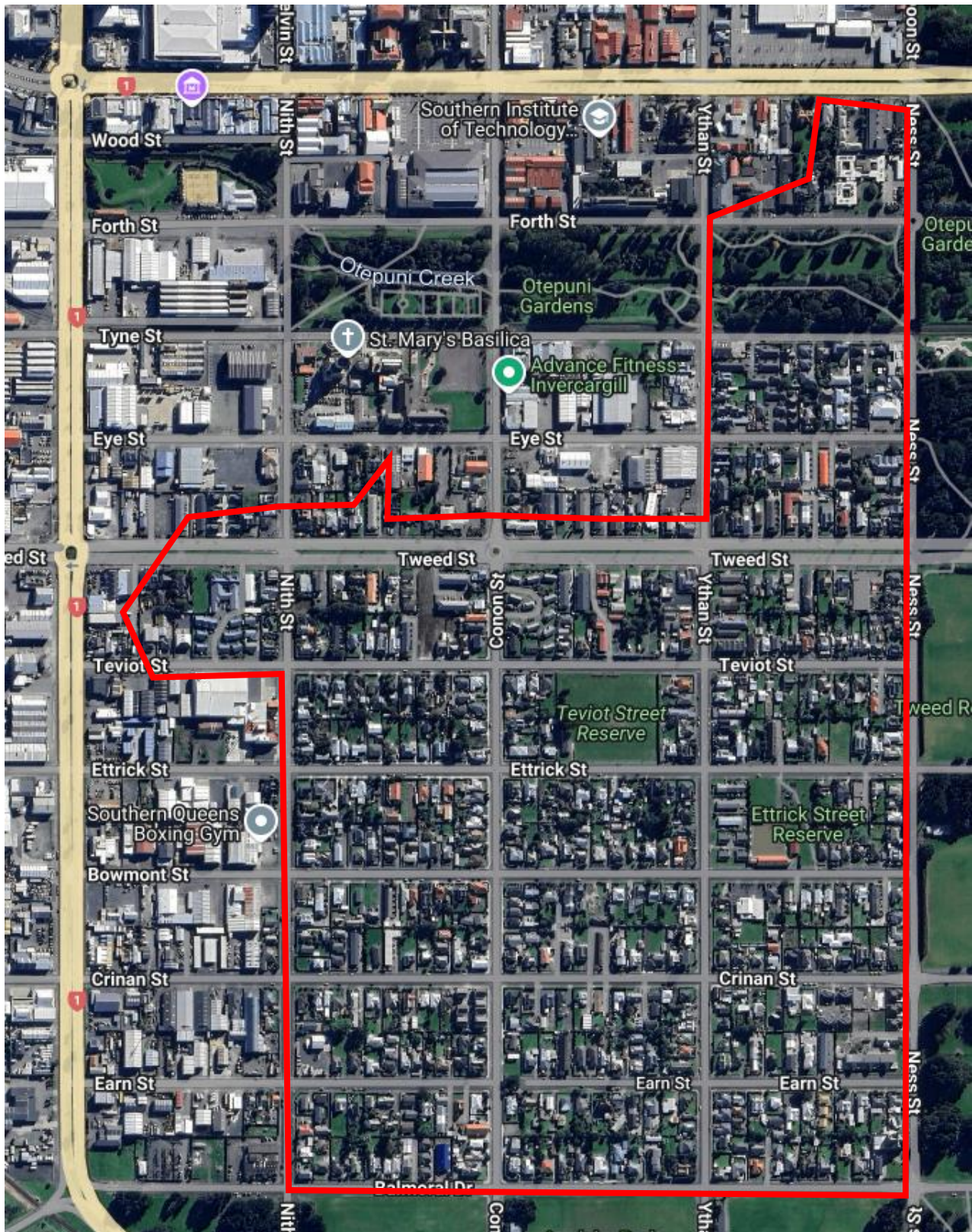


Figure 3: Aerial of Area 2

3.2.1 ROAD NETWORK

The area 2 is made up of roads in a grid pattern which is typical for Invercargill City. Below is the list of roads with their functions and geometry.

Street/Road	Classification	AADT	Width	Current Peak hour (10% of the VPD)
Tay Street	Regional SH	5,500	10m	550
Forth Street	Access	331	18m	30
Tyne Street	Access	225	6.8m	22
Eye Street	Access	337	14m	33
Tweed Street	Arterial	10,769	14m	1,076
Teviot Street	Access	328	14m	32
Ettrick Street	Secondary Collector	390	14m	39
Bowmont Street	Access	281	13.7m	28
Crinan Street	Secondary Collector	1,017	14m	101
Earn Street	Access	144	9.2m	14
Balmoral Drive	Access	326	14m	32
Ness Street	Access	1,391	14m	139
Ythan Street	Access	462	14m	46
Conon Street	Primary Collector	5,002	14.5m	500
Nith Street	Secondary Collector	1,437	14m	143

TABLE 3: LIST OF ROADS FOR AREA 2

Ettrick Street and Crinan Street, classified as the secondary collector, acts as the main route for vehicles travelling east - west as it connects SH1 to Elles Road.

Ness Street and Conon Street are the main routes north-south connecting Tweed Street to Balmoral Drive. Even though Ness Street is classified as an access it carries significant traffic.

3.3 AREA 3

Pomona Street, Tramway Street, Tweed Street, Elles Road and Elles Road, Dalrymple Street and Nith Street

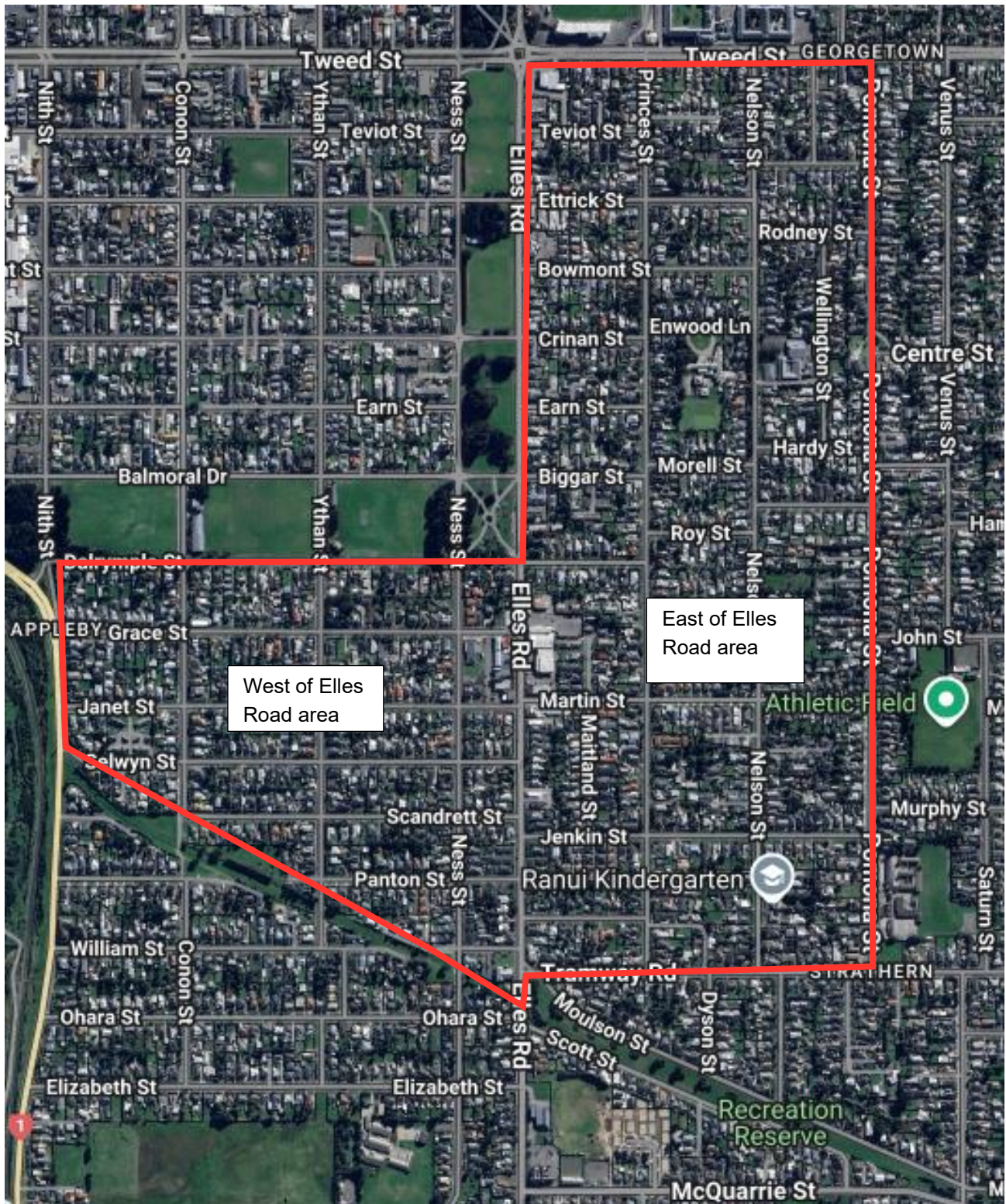


Figure4: Aerial of Area 3

3.3.1 ROAD NETWORK

The area 3 is made up of roads in a grid pattern which is typical for Invercargill City. Below is the list of roads with their functions and geometry.

Street/Road	Classification	ADT (vehicles per day)	Width	Current Peak hour (10% of VPD)
Tweed Street	Arterial	16,019	11.5m	1,600
Elles Road	Arterial	13,904	14m	1,390
Princes Street	Secondary Collector	399	14m	39
Nelson Street	Secondary Collector	1,458	14m	145
Pomona Street	Primary Collector	4,059	10.2m (between John Street and Tweed Street) 17.5m (between John Street and Tramway Road)	405
Tramway Road	Primary Collector	4,352	13m	435
Ness Street	Access	1,391	14m	139
Ythan Street	Access	462	14m	46
Conon Street	Primary Collector	5,002	14.5m	500
Nith Street	Secondary Collector	1,437	14m	143
Janet Street	Secondary Collector	1,640	9.2m	164
Martin Street	Primary Collector	3,786	9.2m	378

TABLE4: LIST OF ROADS FOR AREA 3

3.3.1.1 WEST OF ELLES ROAD

Janet Street runs east - west between SH1 and Elles Road. The intersection of Janet Street and Elles Road has traffic signals, this provides opportunities for vehicles to cross Elles Road.

Conon Street runs north - south between Scandrett Street and Tay Street. This is classified as primary collector and is the main route for vehicles travelling into town. The roundabout at the intersection of Tweed Street and Conon Street makes it easier for vehicles to cross Tweed Street.

3.3.1.2 EAST OF ELLES ROAD

Elles Road is the main arterial connecting Tay Street (SH1) to SH1 South City. It is a major arterial connecting south city. Elles Road runs north - south and is part of the southern scenic route.

Princes Street and Nelson Street are both secondary collectors and connect Tramway Road to Tweed Street. Most of the traffic is residential.

Pomona Street is classified as primary collector; it connects Tramway Road to Tweed Street. Pomona Street also connects into Centre Street for vehicles wanting to travel east. The width of Pomona Street changes from 10.2m wide to 17.5m wide. Pomona Street section between John Street and Tweed Street is narrow 10.2m wide and currently has parking on both sides.

Morton Street/Lindisfarne Street and Tweed Street is a roundabout and provides opportunities for vehicles to cross/enter/exit Tweed Street.

Martin Street runs east - west and is a primary collector. The intersection of Martin Street and Elles Road is signalised and provides opportunity for vehicles to cross/enter/exit Elles Road.

Currently, most side road intersections along Elles Road experience delays for vehicles making right turns, while left turn movements are predominant. Drivers intending to turn right typically utilise intersections controlled by roundabouts or traffic signals to facilitate their manoeuvre.

3.3.1.3 RESIDENTIAL ACCESS STREETS

There are several access roads in the area providing access to the dwellings which form a grid pattern connecting the Primary and secondary collectors. The ADT on these roads is less than 500vpd.

1. Teviot Street, Ettrick Street, Bowmont Street, Crinan Street, Earn Street, Biggar Street, Dalrymple Street run east-west between Elles Road and Princes Street.
2. Ettrick Street, Bowmont Street, Earnwood Lane, Morell Street, Roy Street and Gordon Street run east- west between Prices Street and Nelson Street.
3. Compton Street, Rodney Street, Hardy Street, Collingwood Street run east – west between Nelson Street and Pomona Street.
4. Dalrymple Street, Grace Street, Selwyn Street run east-west between Elles Road and SH1.

3.4 BUS ROUTES

Invercargill City Buses service all the areas identified for RES1 changes. The bus routes run from City Centre Bus Smart Hub to various city suburbs which are listed below

Clifton	Kingswell	Newfield	Hargest	Waverley	Waikiwi
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TABLE5: BUS ROUTES

3.4.1 AREA 1

Waverley Bus Route passes through Yarrow Street. This provides the residents another mode of transport to get to the City Centre or the Bus Smart Hub, from where they can access other bus routes.

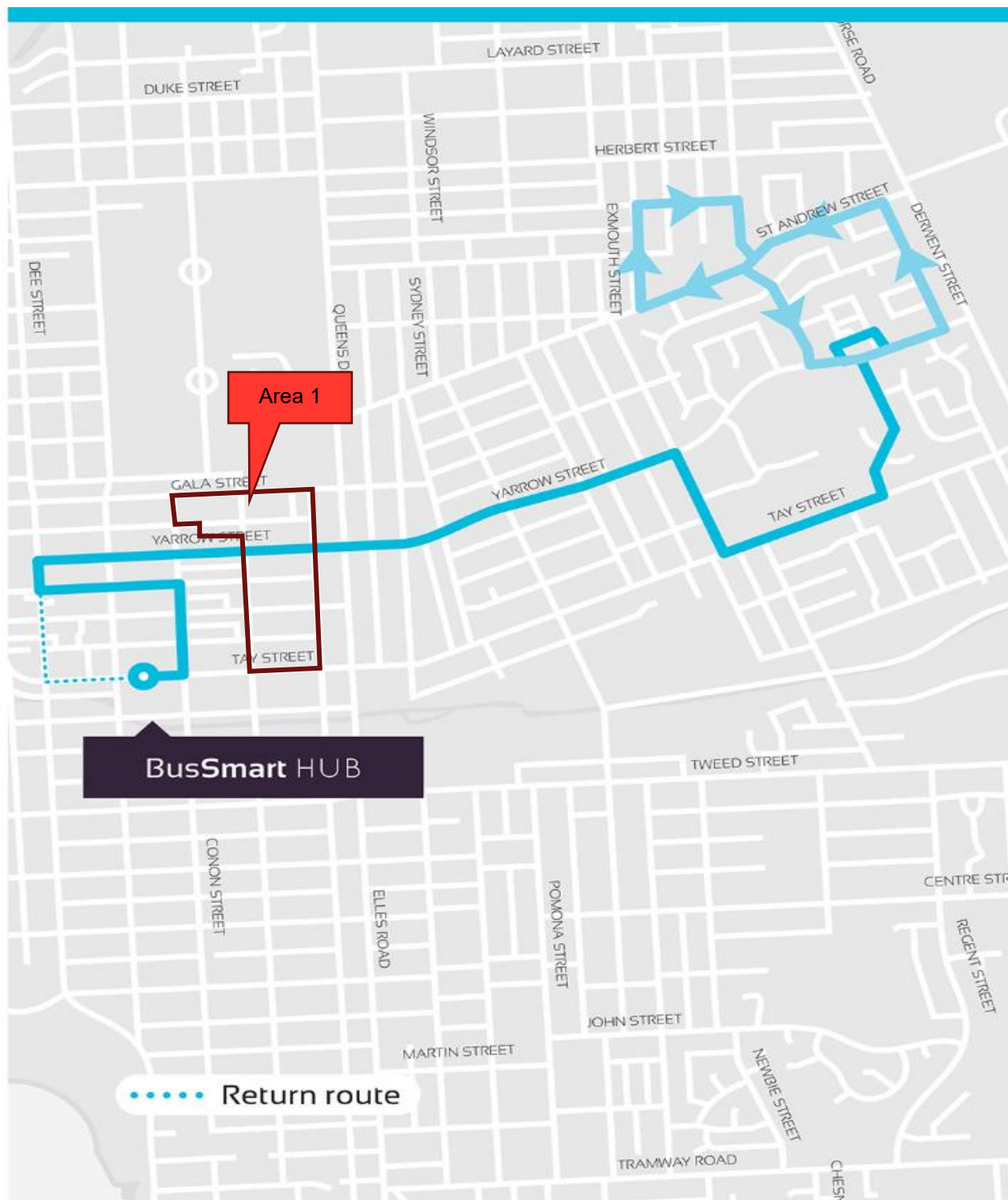


Figure5: Waverley Bus Route

3.4.2 AREA 2

Clifton Bus route passes through Conon Street. This provides the residents another mode of transport to get to the City Centre or the Bus Smart Hub, from where they can access other bus routes.-



Figure6: Clifton Bus Route

3.4.3 AREA 3

Both Clifton and Kingswell Bus routes services area 3. Clifton Bus route pass through Conon Street. Janet Street and Ythan Street. Kingswell Bus route passes through Elles Road, John Street and Tramway Road.

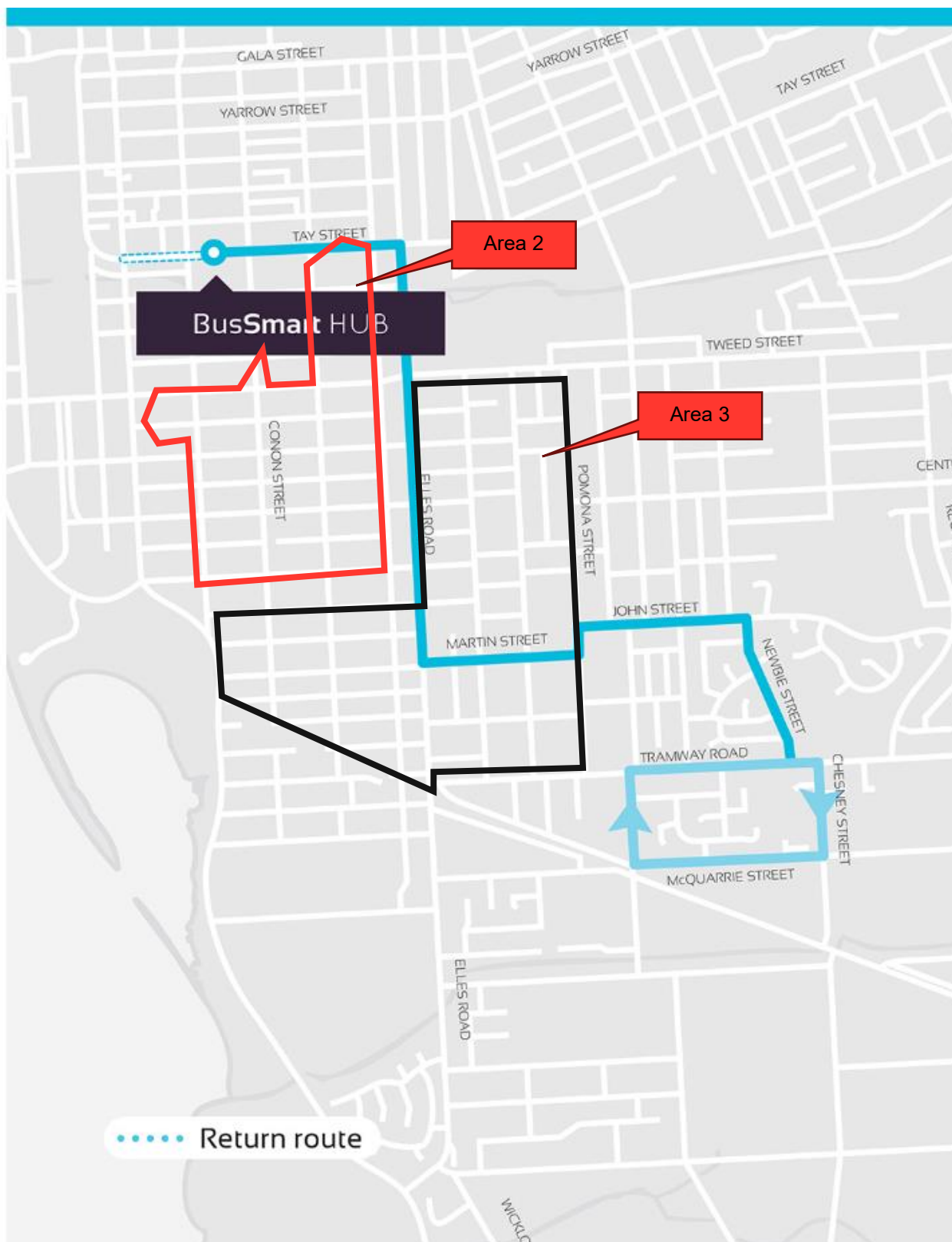


Figure7: Kingswell Bus Route

4 TRAFFIC ASSESSMENT

Traffic generation was calculated using the data from the ICC Housing Sufficiency and Monitoring Report. For RES1 areas, net capacity (additional dwellings) equals feasible capacity minus existing dwellings. The table below shows the number of dwellings needed to meet net capacity under all three scenarios.

The three areas evaluated for RES1A differ in size, and the number of additional dwellings has been allocated proportionally according to each area's size. The number of MRUs was calculated as the difference between the net capacity of Scenario 2 and Scenario 3.

Scenario	Existing Dwellings	Feasible Capacity (total dwellings)	Net Capacity (additional Dwellings)
1 Status Quo	2,901	3,147	246
2 Proposed Plan Change	2,901	4,591	1,690
3 Proposed Plan Change + MRUs	2,901	4,844	1,943

TABLE6: SCENARIOS – ADDITONAL DWELLINGS

4.1.1 AREA 1

The area 1 has an approximate area of 9.9 HA, the net capacity for each of the scenario was distributed proportionally based on the area (6% of the 159.1HA total area for RES1).

The traffic generation for Area 1 as per Report 453 Trips and Parking Demand the traffic generation rate for each dwelling is 10.9vpd and 1.2vph for peak hour traffic. The classification of the area is suburban.

For the MRU's the traffic generation rate is 6.8 vpd and 0.8vph for peak hour traffic.

Scenario	Additional Dwellings	Traffic Generation per day (vehicles per day)	Traffic Generation Peak hour (Vehicles per hour)
1 Status Quo	15	163.5	18
2 Proposed Plan Change	106	1,145	126
3 Proposed Plan Change + MRUs	123	1,260	140

TABLE7: TRAFFIC GENERATION AREA 1

4.1.2 AREA 2

The area 2 has an approximate area of 48.7HA, the net capacity of each of the scenario was distributed proportionally (31% of the 159.1HA total area for RES1)

The traffic generation for Area 1 as per Report 453 Trips and Parking Demand the traffic generation rate for each dwelling is 8.2vpd and 0.9vph for peak hour traffic. The area is classified as suburban (outer).

For the MRU's the traffic generation rate is 6.8 vpd and 0.8vph for peak hour traffic.

Scenario	Additional Dwellings	Traffic Generation per day (vehicles per day)	Traffic generation Peak Hour (Vehicles per hour)
1 Status Quo	76	625	69
2 Proposed Plan Change	522	4,296	471
3 Proposed Plan Change + MRUs	600	4,826	533

TABLE8: TRAFFIC GENERATION AREA 2

4.1.3 AREA 3

The area 3 has an approximate area of 100.5 HA, the net capacity for each of the scenario was distributed proportionally (63% of the 159.1HA total area of RES1).

The traffic generation for Area 1 as per Report 453 Trips and Parking Demand the traffic generation rate for each dwelling is 8.2vpd and 0.9vph for peak hour traffic. The area is classified as suburban (outer).

For the MRU's the traffic generation rate is 6.8vpd and 0.8vph for peak hour traffic.

Scenario	Additional Dwellings	Traffic Generation per day (vehicles per day)	Traffic Generation Peak Hour (Vehicles per hour)
1 Status Quo	155	1,271	139
2 Proposed Plan Change	1,061	8,730	958
3 Proposed Plan Change + MRUs	1,220	9,811	1,085

TABLE9: TRAFFIC GENERTION AREA 3

4.2 TRAFFIC IMPACTS

The approximate capacity of a two-lane two-way road according to the Highway Capacity Manual is estimated to be 1600 passenger car units (pcu) / lane for free flow scenario. For Urban Midblock typical midblock capacity as per Austroads section 5.2 is provided in the table below

Type of Lane	One Way mid-block capacity(pc/h)
Kerb Lane - Adjacent to parking lane	900
Kerb Lane - Occasional Parked vehicles	600
Clearway conditions	900
Median or Inner Lane – Divided Road	1000
Median or Inner Lane – Undivided Road	900

TABLE10: AUSTROADS LANE CAPACITY FOR MIDBLOCK

The values referenced above will form the foundation for assessing the absorption capacity of the road network in this evaluation. Comprehensive capacity analysis has not been conducted by WSP, which is outside the scope of this report.

4.2.1 AREA 1

Scenario 3 represents the highest projected traffic volumes. This scenario is anticipated to increase daily vehicle traffic by 1,260 vehicles per day (vpd) and add 140 vehicles per hour (vph) during peak periods.

As the changes to the Plan Rules will apply zone-wide, and the uptake and location of additional residential development in these areas is market dependent, traffic modelling has not been completed, and a conservative approach to additional peak hour vehicle movements have been applied.

There has been no traffic modelling completed and not knowing where the new dwellings will be constructed, we have assumed the maximum number of new vehicles added during peak hour on the listed roads. These are rough estimates, and the total exceeds the peak hour vehicles generation of 140vph.

Street/Road	Classification	ADT (vehicles per day)	Existing Peak hour (assumed in vph)	Additional Peak Hour Traffic due to proposal (vph)
Gala Street	Arterial	17,941	1,700	50
Yarrow Street	Arterial	7,214	720	50
Don Street	Primary Collector	3,569	356	50
Leet Street	Secondary Collector	624	100	10
Spey Street	Secondary Collector	4,328	432	10
Esk Street	Secondary Collector	2,621	262	10
Doon Street	Secondary Collector	1,037	103	50
Jed Street	Secondary Collector	5,105	510	50

TABLE11: ASSUMED PEAK HOUR TRAFFIC AREA 1

The road network within the area is in a grid pattern, the traffic within the area has multiple options to reach their destination. The major routes east - west are Gala Street and Yarrow Street both are arterials. Doon Street, Jed Street are secondary collectors and Deveron Street is a primary collector.

The existing road network has the capacity to absorb the additional traffic during peak hour. The impacts on the safety and efficiency of the road network will be minor.

Gala Street currently carries 1700vph, almost 850vph in each lane, it has the capacity of absorbing the additional traffic due to the development. If the traffic increases above 900vph each lane due to any developments over and above what is proposed, then additional analysis will be required to assess the decrease in level of service.

Most traffic will use the arterial roads, providing access to signalised intersections. With the proposed number of new dwellings, the increase in delays will be minimal.

4.2.1.1 INTERSECTIONS

Doon Street/ Gala Street – There is a potential of increased delays for right turning vehicles at this intersection.
Jed Street/ Gala Street – There is a potential of increasing delays for right turning vehicles at this intersection, this will be minimal as vehicles will use the neighbouring signalised intersections to turn right. The additional traffic can be accommodated without compromising safety and efficiency.

4.2.2 AREA 2

Scenario 3 represents the highest projected traffic volumes. This scenario is anticipated to increase daily vehicle traffic by 4,826 vehicles per day (vpd) and add 533 vehicles per hour (vph) during peak periods.

As the changes to the Plan Rules will apply zone-wide, and the uptake and location of additional residential development in these areas is market dependent, traffic modelling has not been completed, and a conservative approach to additional peak hour vehicle movements have been applied.

There has been no traffic modelling completed and not knowing where the new dwellings will be constructed, we have assumed the maximum number of new vehicles added during peak hour on the listed roads. These are rough estimates, and the total exceeds the peak hour vehicles generation of 533vph.

Street/Road	Classification	ADT (vehicles per day)	Existing Peak hour (assumed in vph)	Additional Peak Hour Traffic due to proposal (vph)
Tay Street	Regional SH	5,500	550	50
Forth Street	Access	331	30	10
Tyne Street	Access	225	22	20
Eye Street	Access	337	33	20
Tweed Street	Arterial	10,769	1,076	150
Teviot Street	Access	328	32	50
Ettrick Street	Secondary Collector	390	39	100
Bowmont Street	Access	281	28	50
Crinan Street	Secondary Collector	1,017	101	100
Earn Street	Access	144	14	50
Balmoral Drive	Access	326	32	50
Ness Street	Access	1,391	139	100
Ythan Street	Access	462	46	100

Conon Street	Primary Collector	5,002	500	200
Nith Street	Secondary Collector	1,437	143	150

TABLE12: ASSUMED PEAK HOUR TRAFFIC AREA 2

The main routes carrying additional traffic will be the north - south roads such as Conon Street, Nith Street, Ythan Street and Ness Street. These will carry most of the additional traffic from the proposal. Conon Street is the only road that provides vehicles to cross Tweed Street hence this will be the more popular route, as the other alternatives would require vehicles to travel to SH1(Clyde Street) or Elles Road.

The main routes for the east - west traffic will be via Ettrick Street and Crinan Street as they connect SH1 to Elles Road.

The existing road network has capacity to accommodate the additional traffic. There will be increase in delays for vehicles at some of the main intersections in the area, they can accommodate the extra traffic without compromising safety and efficiency. Most of the intersections with Tweed Street are left turn in and left turn out configurations.

4.2.2.1 INTERSECTIONS

Ettrick and Conon Street Intersection – Delays will increase, especially for right turning vehicles. The intersection will need upgrades to provide vehicles access onto Conon Road when the developments are fully operational.

Crinan Street and Conon Street Intersection – Delays will increase, especially for right turning vehicles. The intersection will need upgrades to provide vehicles access onto Conon Road when the developments are fully operational.

Ness and Ettrick Street Intersection – Delays will increase, especially for right turning vehicles. The intersection will need upgrades to provide vehicles access onto Ness Street when the developments are fully operational.

4.2.3 AREA 3

Scenario 3 represents the highest projected traffic volumes. This scenario is anticipated to increase daily vehicle traffic by 9,811 vehicles per day (vpd) and add 1,085 vehicles per hour (vph) during peak periods.

As the changes to the Plan Rules will apply zone-wide, and the uptake and location of additional residential development in these areas is market dependent, traffic modelling has not been completed, and a conservative approach to additional peak hour vehicle movements have been applied.

There has been no traffic modelling completed and not knowing where the new dwellings will be constructed, we have assumed the maximum number of new vehicles added during peak hour on the listed roads. These are rough estimates, and the total exceeds the peak hour vehicles generation of 1,085vph.

Area 3 has been further broken into 2 areas, east and west of Elles Road for this assessment. Area west of Elles Road will generate 30% of the proposed traffic and area east of Elles Road will generate 70% of the proposed traffic.

Street/Road	Classification	ADT (vehicles per day)	Existing Peak hour (assumed in vph)	Additional Peak Hour Traffic due to proposal (vph)
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Tweed Street	Arterial	16,019	1,600	600
Elles Road	Arterial	13,904	1,390	300
Princes Street	Secondary Collector	399	39	100
Nelson Street	Secondary Collector	1,458	145	200
Pomona Street	Primary Collector	4,059	405	300
Tramway Road	Primary Collector	4,352	435	200
Ness Street	Access	1,391	139	50
Ythan Street	Access	462	46	50
Conon Street	Primary Collector	5,002	500	150
Nith Street	Secondary Collector	1,437	143	20
Janet Street	Secondary Collector	1,640	164	150
Martin Street	Primary Collector	3,786	378	200

TABLE13: ASSUMED PEAK HOUR TRAFFIC AREA 3

There are several access roads in the area providing access to the dwellings which form a grid pattern connecting the primary and secondary collectors. The ADT on these roads is less than 500vpd.

5. Teviot Street, Ettrick Street, Bowmont Street, Crinan Street, Earn Street, Biggar Street, Dalrymple Street run east-west between Elles Road and Princes Street.
6. Ettrick Street, Bowmont Street, Earnwood Lane, Morell Street, Roy Street and Gordon Street run east- west between Princes Street and Nelson Street.
7. Compton Street, Rodney Street, Hardy Street, Collingwood Street run east – west between Nelson Street and Pomona Street.
8. Dalrymple Street, Grace Street, Selwyn Street run east-west between Elles Road and SH1.

For the area 3 access roads listed above the additional traffic on these roads due to the proposal is estimated to be 10 to 20 vehicles per hour, which is well within their absorption capacity.

4.2.3.1 WEST OF ELLES ROAD

Conon Street will serve as the main route into the city for areas east of Elles Road. This north-south primary collector is expected to accommodate the highest traffic volume, as it provides a direct connection to the city.

Janet Street will serve as the main connection east - west connecting SH1 to Elles Road. This is the only street where the vehicles can access Elles Road or cross Elles Road, the traffic signals provide them with the opportunity.

4.2.3.2 EAST OF ELLES ROAD

Elles Road currently experiences peak volumes of 1,300 vehicles per hour (vph), and an increase of 300vph. This will result in greater delays and a decreased level of service once the development is fully operational in 25 to 30 years.

The proposed plan will result in increased traffic volumes on Princes Street, Nelson Street, and Pomona Street. Presently, these roads have sufficient capacity to handle the additional vehicles. However, this change is likely to lead to greater delays at the intersections with Tweed Street which can be accommodated but will need changes at the intersections to accommodate for longer queues.

Martin Street is an east - west arterial route that connects Elles Road with Pomona Street and functions as a primary collector. The intersection of Martin Street and Elles Road is the sole signalised junction in this vicinity, facilitating vehicle crossings on Elles Road.

Tramway Road is an east - west arterial route that connecting Elles Road to Rockdale Road. There is capacity to accommodate the extra traffic, but this will increase delays to vehicles at the intersection with Elles Road. The Tramway Road has the capacity to accommodate the additional traffic without compromising safety and efficiency.

Pomona Street is a north - south street connecting Tramway Road to Tweed Street and is classified as a primary collector. Pomona Street provides the connection for vehicles travelling north - south and provides the connection into Centre Street for vehicles travelling east. Pomona Street changes in width between Tweed Street and John Street and with the addition of 300vph this will increase the delays and reduce the level of service.

4.2.3.3 INTERSECTIONS

Pomona Street / Tweed Street - The intersection is currently Give Way controlled, the additional traffic will increase delays for vehicles on Pomona Street. The delays will be excessive for right turning vehicles at the intersection once the proposal is fully developed. The queues will be longer on Pomona Road.

Tramway Road / Elles Road – The intersection is currently Give Way controlled, the additional traffic will increase delays for vehicles on Tramway Road. The delays will be excessive for right turning vehicles at the intersection. The delays at this intersection are currently excessive with additional traffic it will require upgrades to a traffic signals in the next 5 to 10 years.

Elles Road and Tweed Street – The intersection at Elles Road and Tweed Street currently features a two-lane roundabout. Traffic modelling will be necessary to evaluate the impacts and determine the level of service given anticipated increases in volume. With the addition of over 500 vehicles during peak hours, delays at this intersection are expected to rise.

Currently there is no opportunity for vehicles to cross Elles Road between Tweed Street Roundabout and Martin Street Traffic Signals. Further assessment should be completed to determine whether Crinan Street should be upgraded to a roundabout or Traffic Signals in future when the level of service drops.

4.2.4 FUTURE UPGRADES

The impacts will be gradual. The intersections and road network to be modelled and monitored to assess the trigger points for any future upgrades required to the road network. This will provide the council the data to develop a long-term plan to mitigate effects and improve the level of service.

4.3 CYCLING AND PEDESTRIAN ROUTES

4.3.1 AREA 1

There are no marked cycling routes in Area 1. The area has a lot of cyclists due to Queens Park being in the close vicinity. Deveron Street is identified as a cyclist route which connects into Queens Park. The road network within area 1 have footpaths on both sides for Pedestrians. The roads are wide enough to accommodate cyclists.

4.3.2 AREA 2

Conon Street, Ness Street and Tweed Street is part of the inner-city cycling strategy and has cycle lanes marked for both directions. This will provide alternate mode of transport for Area 2 to reach the city. The road network within area 2 have footpaths on both sides for Pedestrians. The roads are wide enough to accommodate cyclists.

4.3.3 AREA 3

4.3.3.1 WEST OF ELLES ROAD

Conon Street and Ness Street has cycle lanes marked for both directions. The road network within area 3 have footpaths on both sides for Pedestrians. The roads are wide enough to accommodate cyclists.

4.3.3.2 EAST OF ELLES ROAD

Tramway Road and Tweed Street has dedicated cycle lanes in both directions. The road network within area 3 have footpaths on both sides for Pedestrians. The roads are wide enough to accommodate cyclists.

Opportunities exist to identify dedicated cycling routes and implement cycle lanes on streets to enhance network connectivity. Such measures would encourage cycling and offer an alternative mode of transportation.

4.4 PARKING

National Policy Statement on Urban Development 2020 section subpart 8 – Car Parking states below

1. If the district plan of a tier 1, 2, or 3 territorial authority contains objectives, policies, rules, or assessment criteria that have the effect of requiring a minimum number of car parks to be provided for a particular development, land use, or activity, the territorial authority must change its district plan to remove that effect, other than in respect of accessible car parks.
2. Territorial authorities must make any changes required by subclause (1) without using a process in Schedule 1 of the Act.
3. Nothing in this National Policy Statement prevents a district plan including objectives, policies, rules, or assessment criteria:
 - a. requiring a minimum number of accessible car parks to be provided for any activity; or
 - b. relating to parking dimensions or manoeuvring standards to apply if:
 - i. a developer chooses to supply car parks; or
 - ii. when accessible car parks are required

The worst-case scenario would be, if the proposed dwellings do not provide off street parking this will result in residents parking on-street. This is not expected to be the reality as most of the development within Invercargill often provide car parks within their properties.

Assuming one park for each new dwelling this will add more cars to park on roads, the table below shows the additional car parks for scenario 3 (highest number of additional dwellings added).

Area	Additional Car Parks
Area 1	149
Area 2	542
Area 3	1102

TABLE14: ADDITIONAL CAR PARKS FOR ALL AREAS

4.4.1.1 AREA 1

All roads within Area 1 are 13.6m to 14m wide and have on-street parking on both sides. Intersections experiencing increased delays may necessitate longer queue lengths, which could require extending the no-parking zones to adequately accommodate these queues.

This area being close to the city centre some of the streets are used for long term parking. The occupancy rates for on street parks are high. If the new dwellings don't provide off street parks, then it would result in parking issues in area.

4.4.2 AREA 2

Tyne Street is the only street which is 6.8m wide and parking is on one side. Rest of the streets in Area 2 vary from 12.8m to 14m and have on-street parking on both sides. Intersections experiencing increased delays may necessitate longer queue lengths, which could require extending the no-parking zones to adequately accommodate these queues. If the new dwellings don't provide off street parks, then it would result in parking issues in area.

4.4.3 AREA 3

Janet Street and Martin Street both are 9.2m wide, with on-street parking on both sides. Both these streets are secondary and primary collectors respectively. The increase in traffic may result in difficulties for vehicles attempting to pass each other when cars are parked on both sides of the street, as this significantly reduces the available traffic lanes. Intersections experiencing increased delays may necessitate longer queue lengths, which could require extending the no-parking zones to adequately accommodate these queues.

The section of Pomona Street between Tweed Street and John Street has a width of 10.2 metres. With on-street parking permitted on both sides and increased traffic volumes, there is likely to be a decrease in the level of service and an increase in delays. This narrow section will require further modelling in the next 10 years to come up with a trigger points.

Most of the residential streets east of Elles Road is 9.2m wide. If the new dwellings don't provide off street parks, then it would result in parking issues in area. The increase in traffic may result in difficulties for vehicles attempting to pass each other when cars are parked on both sides of the street, as this significantly reduces the available traffic lanes. Intersections experiencing increased delays may necessitate longer queue lengths which may need parking bans in the future to accommodate longer queues.

4.5 PUBLIC TRANSPORT

Currently all the three areas are serviced by Public Transport. The routes currently only target few streets in each area as discussed in the Public Transport section. The bus routes through these areas will have to be reviewed to better service the areas where the feasible development potential is realised.

5 CONCLUSIONS

5.1 OVERALL

The proposed residential zone changes will significantly increase housing capacity and traffic volumes across the three areas assessed. While the existing road networks have capacity to absorb additional traffic, some arterials and key intersections are near or at capacity, and will experience increased delays, particularly at priority-controlled and give-way intersections.

The impacts will be gradual. The intersections and road network to be modelled and monitored to assess the trigger points for any future upgrades required to the road network. This will provide the council the data to develop a long-term plan to mitigate effects and improve the level of service.

Enhancing public transport routes and cycling infrastructure will support sustainable transport alternatives.

5.2 SPECIFIC ROADS

The below roads will have significant additional traffic added to them, they will be able to handle the additional traffic, but this would increase delays.

Street/Road	Classification	ADT (vehicles per day)	Additional Peak Hour Traffic due to proposal (vph)	Existing Peak hour (assumed in vph)	Total Peak hour in vph	Increase in %
Forth Street	Access	331	10	30	40	25.00%
Tyne Street	Access	225	20	22	42	47.62%
Teviot Street	Access	328	50	32	82	60.98%
Balmoral Drive	Access	326	50	32	82	60.98%
Ness Street	Access	1,391	150	139	289	51.90%
Ythan Street	Access	462	150	46	196	76.53%
Eye Street	Access	337	20	33	53	37.74%
Bowmont Street	Access	281	50	28	78	64.10%
Earn Street	Access	144	50	14	64	78.13%
Yarrow Street	Arterial	7214	50	720	770	6.49%
Tweed Street	Arterial	16,019	600	1,600	2200	27.27%
Elles Road	Arterial	13,904	300	1,390	1690	17.75%
Gala Street	Arterial	17941	50	1700	1750	2.86%
Tweed Street	Arterial	10,769	150	1,076	1226	12.23%
Pomona Street	Primary Collector	4,059	300	405	705	42.55%
Tramway Road	Primary Collector	4,352	200	435	635	31.50%
Conon Street	Primary Collector	5,002	350	500	850	41.18%
Martin Street	Primary Collector	3,786	200	378	578	34.60%
Don Street	Primary Collector	3569	50	356	406	12.32%
Tay Street	Regional SH	5,500	50	550	600	8.33%
Princes Street	Secondary Collector	399	100	39	139	71.94%
Nelson Street	Secondary Collector	1,458	200	145	345	57.97%
Nith Street	Secondary Collector	1,437	20	143	163	12.27%

Janet Street	Secondary Collector	1,640	150	164	314	47.77%
Leet Street	Secondary Collector	624	10	100	110	9.09%
Spey Street	Secondary Collector	4328	10	432	442	2.26%
Esk Street	Secondary Collector	2621	10	262	272	3.68%
Doon Street	Secondary Collector	1037	50	103	153	32.68%
Jed Street	Secondary Collector	5105	50	510	560	8.93%
Ettrick Street	Secondary Collector	390	100	39	139	71.94%
Crinan Street	Secondary Collector	1,017	100	101	201	49.75%
Nith Street	Secondary Collector	1,437	150	143	293	51.19%

TABLE15: PEAK HOUR TRAFFIC INCREASE

Area 3 residential access roads, the peak hour traffic will increase by 10 to 30 vehicles and have been excluded from the above list.

5.3 INTERSECTIONS

The below intersections will require further modelling,

1. Gala Street / Doon Street Intersection
2. Jed Street / Gala Street Intersection
3. Conon Street / Ettrick Street Intersection
4. Conon Street / Crinan Street Intersection
5. Ettrick Street / Ness Street Intersection
6. Pomona Street/ Tweed Street Intersection
7. Tweed Street / Elles Road Intersection
8. Tramway Road / Elles Road Intersection

Right turns from side roads onto Gala Street, Elles Road, and Tweed Street will face longer delays due to increased traffic.

5.4 PARKING

If the new proposed dwellings do not include off-street parking, this could lead to increased use of on-street parking, including vehicles parked on both sides of the roads. On roads that are less than 10 metres wide, this may slow vehicle movement and reduce the overall level of service. Area 1 currently has a high occupancy rate for on-street parking, and additional demand may increase congestion.

5.5 PUBLIC TRANSPORT

The current bus routes serving Waverley, Kingswell, and Clifton already cover the areas outlined in the proposal. However, these routes may require review to ensure they serve these areas more effectively.

5.6 PEDESTRIANS AND CYCLIST ROUTES

The current road network includes footpaths to support pedestrian movement. Conon Street, Tweed Street and Ness Street feature cycle lanes within Area 2, offering options for cyclists.

East of Elles Road Tweed Street and Tramway Road feature cycle lanes. Additional assessment is necessary to determine which roads can accommodate cyclists in this area.

6 LIMITATIONS

This report ('Report') has been prepared by WSP New Zealand Limited ('WSP') exclusively for Invercargill City Council ('Client') in relation to ITA for Residential Zone Changes ('Purpose') and in accordance with the C1115 Professional Services for Transport ('Agreement'). The findings in this Report are based on and are subject to the assumptions specified in the Report and CBN29 dated 7 July 2025. WSP accepts no liability whatsoever for any use or reliance on this Report, in whole or in part, for any purpose other than the Purpose or for any use or reliance on this Report by any third party.

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



ITA Addendum

To: Emma Spalding
Copy: Grant Fisher
From: Sreenath Venkataraman
Office: Invercargill
Date: 16 October 25
File/Ref: 6-VI066.00/CBN29
Subject: ITA amendment - Invercargill Zone changes

Below is an addendum to our high-level Integrated Transport Assessment (ITA) delivered on 29th September 2025. The ITA was based on the net capacity information provided to us by Rationales – Invercargill City Council Housing Development Capacity and Monitoring Report July 2025 version.

The Capacity and Monitoring report has been subsequently updated, and it has resulted in increase in the net capacity for residential 1A/1B. The impact of the increase in net capacity is assessed below.

Scenario	July 2025 Report- Net Capacity	Final Version – Net Capacity	Change in Net Capacity
1- Status Quo	246	471	225
2- Proposed Plan Change	1690	1932	242
3- Proposed Plan Change + MRUs	1943	2186	243

The ITA was assessed for Scenario 3 in the ITA, the capacity has increased by 243 dwellings. The additional traffic for the three areas is provided in the table below.

Area	Additional Dwellings	Traffic - Vehicles per hour
1	15	13
2	75	67
3	153	138



Conclusion

The increases for all the three areas are well within the limits discussed in the ITA report. The changes to the capacity data have been reviewed and do not materially change the findings and conclusions of this ITA.