27 October 2021

Selwyn District Council
2 Norman Kirk Drive
West Melton
7643
Christchurch

**By email:** online.resourceconsentapplications@selwyn.govt.nz

Dear Selwyn District Council,

Request for Further Information: Plan Change 77

We are responding to the Request for Further Information (RFI) for 1234 West Coast Road, Plan Change 77 (PC77) that was issued on the 27 April 2021 to Marama Te Wai Ltd.

Yours faithfully
**INOVO PROJECTS**

Peter McAuley
Director
**T.** 022 217 2858
**E.** peter@inovo.nz

Request for Further Information (RFI) Document – 27 April 2021

- Please see the matters outlined in the RFI by Council in (italics) and our response (not in italics).

1. *Please provide a list of the addresses, legal descriptions and ownership details of the properties along Shepherd Avenue incorporated into this plan change request, i.e., complete Table 1 so that it relates to all properties affected by the proposed plan change.*

| Application Address | Appellation Title | Area (ha) | Owners |
|---|---|---|---|
| 1234 West Coast Road | RS 6619 | 12.55 | West Melton Holdings Limited |
| 1252B West Coast Road | Lot 1 DP 471561 | 5.19 | Michael James Fitzgerald, Sarah Jane Fitzgerald |
| 1252A West Coast Road | Lot 2 DP 471561 | 4.8085 | Scott Carl Eden, Sharlene Marie Eden |

| | | | |
|---|---|---|---|
| 345 Halkett Road, West Melton | Lot 1 DP 525046 | 4.67 | Julie Alison McLeod, Sylvia Eleanor Searle, Peter Hartley Walker, Stephen Cloudsley Walker |
| 341 Halkett Road | Lot 2 DP 525046 | 4.08 | Joy Margaret McLeod, Peter Alan McLeod |
| 343 Halkett Road | Lot 3 DP 525046 | 4.67 | Alma Hughes, Kyle Hughes, Roger Hughes |
| **Greenfields Total** | | 35.9685 ha | |
| **West Shepherd Avenue Sections** | | | |
| 95 Preston Avenue | Lot 250 DP 456695 | 0.4 | Gerard Michael John Jordan, Halina Maria Jordan, Norman Lawrence Withers |
| 91 Preston Avenue | Lot 249 DP 456695 | 0.37 | Paul Alexander Munro |
| 87 Preston Avenue | Lot 248 DP 456695 | 0.5477 | Graeme Stewart Curtis, Grant Rae |
| | Lot 4 DP 525046 | 0.3588 | Graeme Stewart Curtis, Grant Rae |
| | Lot 5 DP 525046 | 0.2151 | Graeme Stewart Curtis, Grant Rae |
| 83 Preston Avenue | Lot 247 DP 456695 | 0.5 | Cambridge Trustees Limited, David Eric Riddell, Patricia Gaile Riddell |
| 79 Preston Avenue | Lot 246 DP 456695 | 0.4831 | Richard Geoffrey Erskine, Patricia Louise Standfield |
| | Lot 6 DP 528937 | 0.2853 | Richard Geoffrey |

| | | | |
|---|---|---|---|
| | | | Erskine, Patricia Louise Standfield |
| 75 Preston Avenue | Lot 245 DP 456695 | 0.4475 | Julie Anne Smith, Kevin James Smith |
| | Lot 7 DP 525046 | 0.3297 | Julie Anne Smith, Kevin James Smith |
| 71 Preston Avenue | Lot 202 DP 453222 | 0.4482 | Melanie Ruth England, Murray Russell England |
| | Lot 8 DP 525046 | 0.3748 | Melanie Ruth England, Murray Russell England |
| Reserve | Lot 411 DP 453222 | 0.5052 | |
| 4 Shepherd Avenue | Lot 201 DP 453222 | 0.3875 | Dennis Arthur Boden, Gillian Margaret Boden |
| 8 Shepherd Avenue | Lot 200 DP 453222 | 0.4072 | Charlene Heather Benson, Philip Reginald Benson |
| | Lot 9 DP 525046 | 0.5221 | Charlene Heather Benson, Philip Reginald Benson |
| 12 Shepherd Avenue | Lot 199 DP 453222 | 0.4014 | Gyorgy Ferenc Stefanissin, Jacqueline Ann Stefanissin |
| | Lot 10 DP 525046 | 0.2075 | Gyorgy Ferenc Stefanissin, Jacqueline Ann Stefanissin |
| 16 Shepherd Avenue | Lot 198 DP 453222 | 0.4026 | Brendon Basil Anderson, Elene Anderson |
| | Lot 11 DP 525046 | 0.1886 | Brendon Basil Anderson, Elene |

| | | | |
|---|---|---|---|
| | | | Anderson |
| 20 Shepherd Avenue | Lot 197 DP 453222 | 0.3763 | Raymond Wayne Young, Sandra Maree Young |
| 24 Shepherd Avenue | Lot 196 DP 453222 | 0.3125 | David King, Sharon Anne King |
| 28 Shepherd Avenue | Lot 195 DP 453222 | 0.3064 | Nicola Jane Holland, Stephen John Mangels |
| 32 Shepherd Avenue | Lot 194 DP 453222 | 0.3107 | Jonathan Ross Cole, Sarah Caroline Cole |
| 36 Shepherd Avenue | Lot 193 DP 453222 | 0.4235 | Nathan John Russ, Robyn Newham Russ |
| 40 Shepherd Avenue | Lot 284 DP 458646 | 0.4633 | Kim Marie Grave, Steven William Grave |
| 44 Shepherd Avenue | Lot 283 DP 458646 | 0.4999 | Natalie Jane McGeady, Wayne Leslie McGeady<br>NB/ The Applicant has reached agreement to purchase this site. |
| 48 Shepherd Avenue | Lot 282 DP 458646 | 0.4999 | Anne Marie Owens, Wayne Owens |
| 52 Shepherd Avenue | Lot 281 DP 458646 | 0.5 | Schmitt Family Trustees Limited |
| 56 Shepherd Avenue | Lot 280 DP 458646 | 0.4869 | Assi Elina Verkasalo, Cameron McGregor Whyte |
| 60 Shepherd Avenue | Lot 356 DP 469289 | 0.4432 | Christopher Richard Urmson, |

| | | | |
|---|---|---|---|
| | | | Dominica Margaret Urmson |
| 64 Shepherd Avenue | Lot 357 DP 469289 | 0.3485 | Anthony John Rabbidge, Sandra May Rabbidge, Brent Washington Smith |
| 68 Shepherd Avenue | Lot 358 DP 469289 | 0.3110 | John Raymond Cansdale, Vicki Lorraine Cansdale, Justine Louise Grey |
| 72 Shepherd Avenue | Lot 359 DP 469289 | 0.3104 | Karen Curtis, Martyn Curtis |
| 76 Shepherd Avenue | Lot 360 DP 469289 | 0.3132 | Amanda Jane Diehl, Andrew Karl Diehl |
| 80 Shepherd Avenue | Lot 361 DP 469289 | 0.3282 | Doreen Lorraine Daniel, Roye Daniel |
| 84 Shepherd Avenue | Lot 362 DP 469289 | 0.4153 | Stephen James Lycett |
| **West Shepherd Avenue Sections Total** | | 14.40 | |
| **Grand Total** | | 50.3685 | |

2. *Please provide evidence that the owners of the properties on Shepherd Avenue within the plan change area are party to, or supportive of, the request.*

   Our Response:

   The Applicant has consulted with the owners of the relevant properties on Shepherd Avenue (within the Plan Change area) by means of a letter box drop informing them of the proposed Plan Change. As yet we have had no response. Please see an example of the letter included in the **Appendix A.**

3. *If any, or all, of the above land owners do not wish to be party to the plan change, please*

*provide the rationale for including these parcels in the plan change request.*

Our Response:

The Applicant has not received any feedback from any owners consulted that they do not wish to be a party to the plan change. Please however note that the Applicant has secured properties at 1234 West Coast Road (being 12.5ha) and 44 Shepherd Avenue.

Please also note that notwithstanding the proposed Plan Change, intensification of the existing Living 1 West Melton lots will be at the discretion of the owners.

4. *Please provide a copy of any feedback received from Mahaanui Kurataiao Limited on the requested plan change.*

Our Response:

The Applicant has consulted with Mahaanui Kurataiao Limited (MKT). MKT are still in the process of finalising their feedback. Once this has been completed it shall be passed on to Council. We expect this to be in the next 14 days from the date of this letter.

5. *Please provide details of any consultation undertaken with Waka Kotahi/NZTA regarding the proposed new intersection onto State Highway 73.*

Our Response:

The Applicant has consulted with Waka Kotahi/NZTA regarding the proposed new intersection onto State Highway 73. Evidence of consultation has been provided with this application in **Appendix B**.

Further to this, we can confirm that a formal meeting has been held with Waka Kotahi/NZTA and Stantec. A general summary of the findings of the meeting are as follows:

- A proposed T-intersection is not considered an acceptable safe system solution based on the 100-km/h posted speed limit (and likely operating speeds along the road at the access point). Waka Kotahi did not indicate what form of intersection would be acceptable but agreed that 'proportionality' would be considered (i.e., level of traffic movements).
- As starting position, the application will be considered in terms of the Greater Christchurch Partnership (GCP) planning strategies / policies from a strategic perspective and the likely consequences of further growth in West Melton and may involve discussions with the other GCP parties including Selwyn District Council. The methodology for this has not been confirmed.
- The Integrated Transport Assessment (Carriageway Consulting) included with PC77 as lodged and Road Network Connectivity Assessment (Stantec) prepared subsequently and included with this RFI (see **Appendix C**) are in the process of being reviewed by

an external consultant engaged by NZTA. This review will inform NZTA's feedback on the proposed access and associated network impacts.

In light of the above, NZTA will be in position to further comment on PC77 in up to 4 weeks.

6. *Please provide an updated ODP addressing the various matters below and also include explanatory text addressing matters such as density, access and transport, open space, recreation and community facilities, servicing and reverse sensitivity.*

**Our Response:**

INTRODUCTION

The Outline Development Plan (ODP) is for an area of land located on the north western edge of West Melton. The Site boundaries are defined by West Coast Road (SH) to the south, the existing Preston Down subdivision to the east and Halkett Road to the north. The western boundary is with existing rural lifestyle blocks. The ODP has road access onto West Coast Road (SH), Halkett Road and Shepherd Avenue.

The ODP is based on an urban design concept that focuses on movement, connectivity and residential amenity to achieve a cohesive future urban form. The design concept for the Site uses a similar approach as the Preston Down layout with dominant north south road connections supporting the natural drainage pattern of the underlying terrain.

URBAN DESIGN

Design principles that underpin this ODP are in line with the New Zealand Urban Design Protocol and the following best practice urban design principles have been considered in the development of the ODP:

- Provide strong linkages and a well-connected internal road network which accommodates all modes of transport and encourages pedestrian movement
- Provide a Hierachy of movement corridors to aid legibility
- Adopt blocks with a predominant north-south orientation in order to maximise solar gain
- Provide gateway features on Halkett Road and SH73 to contribute to forming legible gateways into the township
- Provide a variety of residential lifestyle options, which offer a range of housing typologies and price points, including more affordable options
- Provide dedicated open spaces which function as the heart of the new community and provide residents with access to daily recreation and social interaction
- Enable future residents access to local services, facilities and recreation within easy walking/cycling distance
- Protect residential amenity along SH73

DENSITY

The ODP layout has been designed to accommodate several medium density housing locations, which will provide a greater mix of house types and price points and enable the minimum density of 12 hh/ha to be met across the ODP area as a whole.

These intensified pockets of MD should be co-located with the open green spaces and /or high amenity streetscapes. The MD areas should not be located at the periphery of the site to avoid affecting the rural interface or existing residential areas.

With regard to density and amenity - West Melton as a township has a very low density and is only now starting to gradually consolidate its form. Residential development regardless of density therefore needs to address the underlying character of the village and contribute to its amenity. This can be achieved through careful placement of Medium Density developments.

The ODP does not specifically highlight areas for MD small site or comprehensive residential developments as these are best identified through the subdivision design process when more accurate and detailed information is available to make better informed decision and assess the suitability of each location.

## MOVEMENT NETWORK

A direct road connection to SH73 will be the main entry to the Site and continue as a primary route north-south from SH73 to Halkett Road.

A secondary road connection runs east-west across the site creating an eastern access opposite Elizabeth Allen Avenue. This access forms a key link to the east and achieves connectivity between the proposed development and the existing township. It is strategically located in a central position, connecting the key open space within the Site with the eastern neighbourhood. Two other possible roads and /or cycle and pedestrian links running east – west should link directly to Sheppard Avenue and the east – west roads in Preston Downs. Any future subdivision should be 'future proofed' to facilitate provision of these additional possible connections. There should be no residential lots in the path of these potential additional secondary connection points.

Possible road and pedestrian /cycle connections are also proposed along the western boundary, to allow for potential further growth westwards.

Further connectivity within the Site, is provided through additional local roads (to be confirmed at the subdivision stage) and pedestrian/cycle ways providing linkage to all destinations such as the neighbourhood parks and utility reserves.

## GREEN NETWORK

Two public open spaces are included in the ODP to add amenity to the neighbourhood, provide relief from more compact residential clusters, and provide residents with the opportunity for recreation.

The northern recreational reserve has been placed in line with the existing reserve on Shepherd Avenue to create a green linear network for high amenity off road pedestrian and cycling

connections. This reserve is central to the northern portion of the site and creates a break in the development and a natural space to congregate. The linear shape aids in the drainage of this northern part of the site.

The central reserve has been co-located with the utility reserve to create a large open space that can open up the denser built environment. It also enables views to the west and northwest / towards the Southern Alps providing a sense of orientation and sense of place for West Melton within the wider context of the Canterbury Plains.

The utility reserve in the south of the Site creates an open space contributing to an attractive entry into the development and a natural setback for dwellings. It also has the opportunity to function as the 'green gateway' into the Site and offers a 'spatial break' and casual meeting place for the community.

SH 73 Road frontage is planned to have incorporated a 12 metre buffer for landscaping, cycling and walking which with Council's support could eventually connect to the east with Weedons Ross with appropriate passive surveillance and contribute towards the creation of a more urban streetscape and entry into the town. Detailed resolution of all the above shall be developed at the subdivision stage.

BLUE NETWORK

Stormwater – A natural ridge runs northwest/southeast connecting with Shepherd Avenue at its intersection with Wilfield Drive. This naturally splits the Site into two catchments, being the northern and southern catchment. A stormwater management area (SMA) for each catchment area will consist of a:

- A first flush/infiltration basin
- A detention basin to provide water quality attenuation in large rainfall events greater than the first flush event, but up to 2% AEP in all durations.
- A large rapid soakage chamber under the detention basins to discharge stormwater to ground and provide additional storage within the voids of the chamber.

Water – An additional water source and treatment plant will be required. The requirement for the additional water source and treatment plant will be determined at the subdivision stage. Water connections are required to enable development.

A utility lot will need to be provided for the water supply. This should be accommodated in the south-eastern quadrant.

Water race – There are two local/lateral water races in the middle to north of the ODP area that are part of the Paparua Water Race Scheme. Any Subdivision and road design will account for the presence of the water race, ensuring its ongoing function is not compromised until the water race is closed with the appropriate agreement with Council and affected landowners.

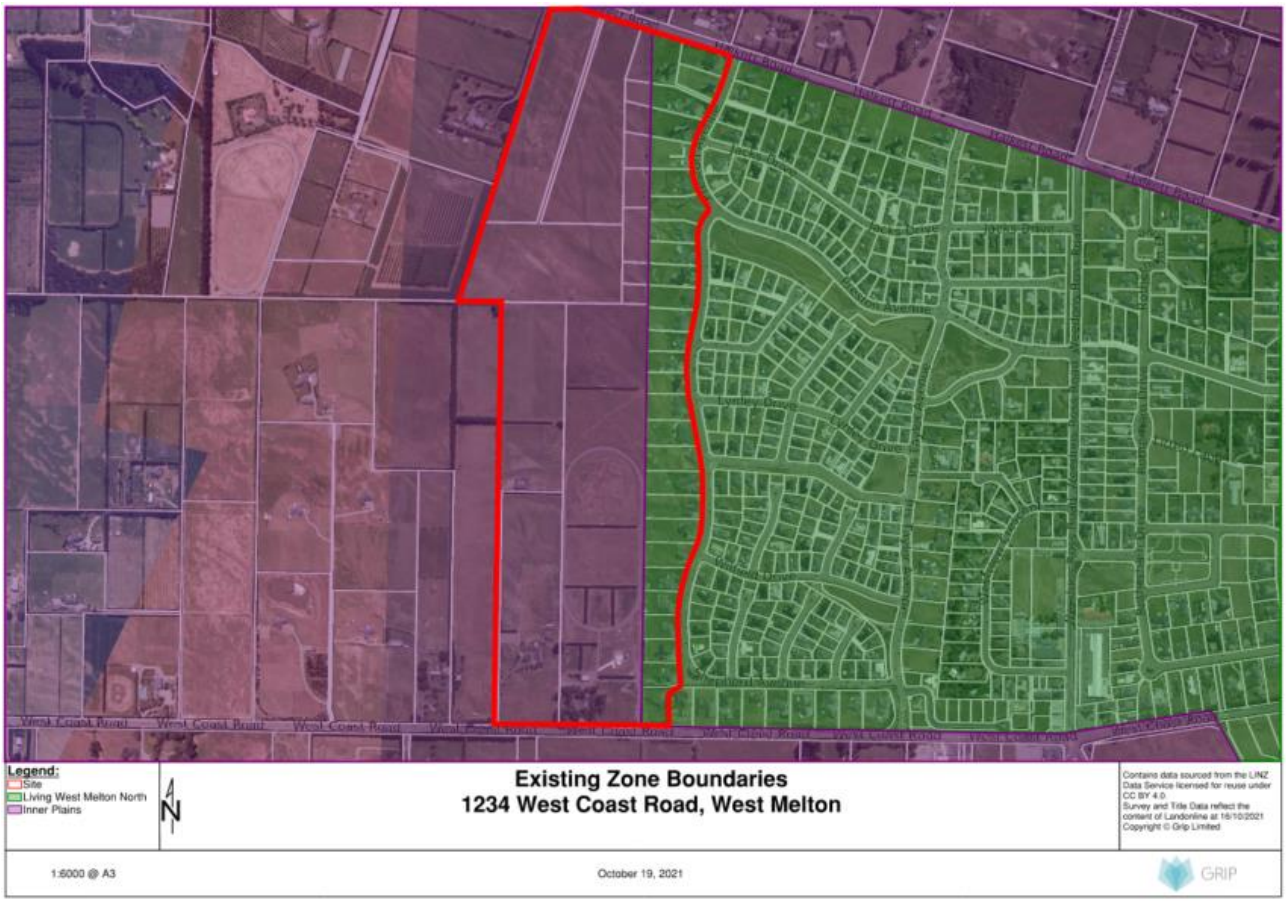
Sewer – The main constraint for West Melton with respect to wastewater is the reticulation from West Melton to the Pines Wastewater Treatment Plant at Rolleston. Servicing options for addressing capacity constraints are available which can be determined at the subdivision stage.

All feasible options require a new pressure main along the West Coast Road to connect to the existing pressure main at the West Melton Road/West Coast Road intersection.

7. *Please update Figure 1 of the proposed plan change document to reflect the current zoning found in the operative Selwyn District Plan.*

**Our Response:**

Please see the updated Figure 1 below:




8. *Please update the ODP/accompanying explanatory text to include the overall density target and also to at least describe the areas where any Medium Density Residential Development is proposed.*

*[Please also see #20 below regarding the Council Urban Designer's query over the proposed approach to the provision of Medium Density]*

**Our Response:**

Please refer to point 6. above.

9. *Please advise of any discussions with the owners of these adjoining properties (as well as Council and the Department of Conservation) regarding the feasibility of the proposed roading connections between the area of the plan change and the existing township proceeding as shown on the ODP.*

**Our Response:**

We have provided a letterbox drop to all parties along Shepherd Avenue, this includes the outline development plan and proposed roading connections. There have been no verbal discussions entered into at this stage with the respective parties. We note that the new ownership structure within Marama Te Wai Limited has secured the property at number 44 Shepherds Avenue (in addition to 1234 West Coast Road), which creates a direct link through into the township to the east.

As all parties will be aware any changes made to a recreational reserve will likely require public consultation at an appropriate time. The potential transportation route through Lot 410 DP 453222 is a continuation of the recreational reserve corridors to the east. Unfortunately, the ability to continue this to the west is hampered somewhat by the recent survey placing residential sections on the western boundary of the reserve. Any roading/transportation corridor continuing along the extension of Prestons Avenue to the west would have the benefit of unlocking a continuation of this recreation corridor to the west.

To date there has been no formal dialogue with Department of Conservation.

10. *Please provide some commentary on the ability of the plan change to proceed in the absence of the ability to secure one or any of the proposed connections. Furthermore, please advise of the proposed mechanisms included within the amendments to the operative District Plan to ensure that residential development could not proceed until such time as these connections are available.*

**Our Response:**

We can confirm that the 'promoter of plan change' has purchased 44 Shepherd Avenue (in addition to owning 1234 West Coast Road). This will act as a secondary road connection. The secondary road connection runs east-west across the site creating an eastern access opposite Elizabeth Allen Avenue. This access forms a key link to the east and achieves connectivity between the proposed development and the existing town. It is strategically located in a central position, connecting the key open space within the Site with the eastern neighbourhood.

In respect of the northern and southernmost east-west connections (to Prestons Avenue and Wilfield Drive), Stantec have advised that from a practical perspective, the development can proceed without securing any of the proposed 'internal' east-west connections on the eastern side. Ideally we acknowledge that these latter connections will provide increased connectivity and the ODP reflects this.

Please also refer to commentary made by the Applicants Urban Designer - **Appendix D**.

11. *Please provide sufficient engineering detail to show how the proposed connection and re-*

*alignment could be accommodated within the existing land available without impacting on other adjoining private landholdings.*

**Our Response:**

Please refer to Appendix F which indicates the engineering details showing how the proposed connection and re-alignment could be accommodated within the existing land available without impacting on other adjoining private landholdings. The road connections are shown as being indicative/conceptual and/or possible. The 'promoter of the plan change' have purchased 44 Shepherd Avenue (in addition to owning 1234 West Coast Road), which will enable through road connection/linkage between the proposed Plan Change area and Elizabeth Allen Drive. As indicated in the engineering details in Appendix F, there, shall be no likely conflict from the proposed roading connections.

12. *Please provide further detail as to the proposed pedestrian and cycle linkages through to West Melton township, in particular the School and existing amenities.*

**Our Response:**

Refer to conceptual intersection design attached in **Appendix F** which show pedestrian/cycle linkages at the Elizabeth Allen Avenue intersection. This access forms a key link to the east and achieves connectivity between the proposed development and the existing town. It is strategically located in a central position, connecting the key open space within the Site with the eastern neighbourhood.

Further, an additional two indicative east/west roading/pedestrian/cycle connections are indicated on the northern and southernmost aspects of the ODP area which connect onto Shepherd Avenue. Shepherd Avenue has existing pedestrian and cycle pathways on the eastern side, providing additional linkages through to the West Melton Township and the surrounding area.

13. *Please clarify what the green dot shown on the ODP represents.*

**Our Response:**

The green dot is intended to be a green link to extend from the central green space to the western boundary to create a future high amenity corridor and provide a break in the built environment.

14. *Please provide an assessment of how the request would contribute to the function of the wider urban environment, the surrounding district and the Greater Christchurch Area.*

**Our Response:**

The NPS-UD 2020 does not make it explicit the scale at which individual proposals such as Plan Change 77 are to be tested against, in particular whether it should be at a local, sub– regional

or regional scale. The Selwyn District Council is a Tier 1 local authority which itself has responsibilities for enabling housing capacity within its district within the short, medium and long term. This would suggest that focus of assessing proposals against Policy 1 of the NPS-UD should be more localised.

Nevertheless, RFI 14 has been responded to as requested.

Clearly the Plan Change proposal satisfies Policy 1 within a township frame of reference.

The findings of the Urban Design Statement (**Appendix 8** of the application as lodged), considers the urban form arising from the proposal and in particular whether the direction of growth provided for by this Plan Change application will create an appropriate urban form and density for the West Melton township. The Urban Design Statement addresses key elements of a well-functioning urban environment in terms of:

1. Movement and connectivity
2. Placemaking, Community and Neighbourhood Identity - Green Spaces
3. Lifestyle choice and density
4. Interfaces with adjoining land.

That Assessment identifies six key features of the proposal:

1. Continues the direct green links between Preston Downs and the proposed new recreational reserve through the extension of Prestons Avenue (northern connection) and Elizabeth Allen Avenue (central connection);
2. Provides for future connections to adjacent development in the future;
3. Delivers residential development at a minimum density of 12 households/hectare and provides for a variety of residential house types, lifestyles and price points through some sites of medium density housing;
4. Promotes social interaction and neighbourhood cohesion through the inclusion of neighbourhood reserves and strategically located local connections internal and external;
5. Encourages active transport modes through the provision of shared paths that provide both internal connectivity as well as links to the wider West Melton area with a focus on walking and cycling and building on the close walkable connection to the town centre;
6. Balances the constraints of site shape, geometry and the uncertainty of the noise contour line with the desire to provide a cohesive well connected residential environment;

NPS-UD Policy 1 defines the elements of an urban environment which are required as a minimum for it to be 'well-functioning'. PC77 as lodged assesses the proposal against these criteria at a township level (reproduced below), with additional comments with respect to its assessment at the District and Greater Christchurch level inserted:

| NPS-UD Policy 1 | Assessment |
|---|---|
| (a) have or enable a variety of homes that:<br>(i) meet the needs, in terms of type, price, and location, of different households; and<br>(ii) enable Māori to express their cultural traditions and norms; | The proposal is to have medium density, standard and larger (minimum average 1000m$^2$) lots supporting different housing typologies and price points. West Melton currently has an existing very low density residential character, so the proposed LZ development will broaden the range of housing options available here.<br><br>The rezoning will deliver around 525 additional lots. At a township, District and Greater Christchurch level, it will in particular meet the needs of those persons specifically wishing to move to or remain in West Melton, including enabling more opportunity to 'age in place' due to the provision for smaller sites. |
| (b) N/A business sectors | |
| (c) have good accessibility for all people between housing, jobs, community services, natural spaces, and open spaces, including by way of public or active transport; and | The Site is within easy and convenient walking/cycling distance to the existing West Melton shops and school on the north side of the West Coast Road; and to the community centre, preschools, Domain and West Melton Tavern. NZTA proposed upgrade at the West Melton Road/SH/Weedons Ross Road intersection will improve the efficiency and safety of this intersection, facilitating pedestrian movements across the SH and resolving SH severance issues which have hampered development of the township to date (see **Appendix 3** of application as lodged for details).<br><br>The Site layout can be designed to support future public transport, with the widths of primary and secondary roads wide enough for a bus stop. There is currently a public bus service between West Melton, Darfield and central Christchurch with various bus stops at West Melton. There is also a private school bus service into Christchurch.<br><br>West Melton is close to a number of significant employment hubs including Rolleston north industrial development (Izone and Iport), Darfield (including Fonterra dairy factory), Christchurch International Airport, Hornby and Islington. In terms of proximity, at a District and Greater Christchurch scale, it has good accessibility to these employment hubs. |
| (d) support, and limit as much as possible adverse impacts on, the competitive | This proposal for rezoning will contribute to ensuring some competition in the West Melton |

| | | |
|---|---|---|
| | operation of land and development markets; and | market, with the other urban growth proposals (Plan Changes 59, 67 and 74) involving just two developers. At a District and Greater Christchurch level, it will contribute to a more competitive land and development market by facilitating entry of a new 'player' into the market (the PC77 applicant). |
| (e) | support reductions in greenhouse gas emissions; and | The Site has significant advantages in being within walking distance of the town centre and township reserves, community facilities and school. The Site is readily accessible to a public bus route which includes stops along West Coast Road.<br><br>The proposal enables a consolidated form to West Melton with excellent connectivity and linkages via multiple transport modes to the town centre reducing the need for car travel, and including the potential for a second linkage to the community centre, Domain and West Melton Tavern on the south side of the SH via a new SH crossing linking to future potential residential development in the southwest quadrant of the township.<br><br>West Melton is a Service Town in the District's Township Network and so there is likely to be some continued reliance on neighbouring larger centres for higher order services. There is likely to be some continued reliance on private vehicle trips to travel to neighbouring centres. However, this may not be significant especially over time. Mitigating factors will include increasing use of electric vehicles and alternative modes of transport, working from home opportunities, accessibility of recreational opportunities within West Melton itself and a degree of convenience shopping available locally. |
| (f) | are resilient to the likely current and future effects of climate change | The Site is an inland site away from major rivers. It is not at risk from climate change induced extreme natural hazard events like sea level rise, or river flooding. |

In summary, the proposed Plan Change will contribute about 525 new lots in a favourable location on the edge of the township. It will:

1. provide a variety of dwellings enabling diversity in the type, price and location of different households in a district with very rapid population growth, including a higher density (12 hh/ha), than the existing Rural Inner

Plains Zoning facilitating greater provision of housing for smaller households, including retirees and single person households as well as families;

2. provide good accessibility to the rest of the District being an edge site well serviced by arterial roads and close to the State Highway;
3. support the competitive operation of the land and housing market creating choice and diversity within the District with competing location urban location options at West Melton, Lincoln, Prebbleton and Rolleston;
4. support reductions in greenhouse gas emissions at a District level by facilitating consolidated and compact urban growth at higher densities than currently exist at West Melton in a location and manner which will facilitate a walkable community, and in close proximity to the services, facilities and employment opportunities of neighbouring larger centres;
5. be resilient to the likely current and future effects of climate change reflected in sea- level rise and storm surges, adaptable to heavy rainfall events/frequency, and the potential for building and landscape design to mitigate increased mean temperatures or amplification of heat extremes.

This is a significant proposal at 525 lots at full development. It will contribute to a well-functioning Greater Christchurch urban area by adding substance to an existing township that satisfies Policy 1 matters relating to housing choice and diversity, including in relation to creating a competition in the land market with the price points the development can provide compared to similar suburban development in the City and Waimakariri. The proposal will support a competitive regional land and development market by offering additional and mainstream residential dwelling choices at a range of densities in an accessible location.

Recent highway investment by the Government including the Southern Motorway ensures good accessibility at a regional level between housing, jobs, education, community services, reserves for car-based trips, while provision is made for public transport and cycling options at a regional level.

Plan Change 77 enables:

a) Upgrades to West Coast Road and Halkett Road and key intersections improving access for residents to community facilities and connectivity to the State Highway 73;
b) Future proofing future access to further land development west of the Site;
c) Residential development at a density of 12 households/hectare and provides for a variety of residential house typologies, lifestyles and price points including medium density housing;
d) Connectivity to the town centre at West Melton through direct connections with

the extension of Prestons Avenue, Elizabeth Allen Avenue and provides for connection to adjacent future residential development to the south and east;

e) active transport modes with shared paths and on-road cycle lanes – linking community amenity areas and reserves;

f) a sensitive response to its interfaces with both existing and future adjacent development.

The plan change application provides connections to adjoining existing and proposed development areas and both provides for and enables a consolidated urban form, consistent with providing a well-functioning urban environment on a scale wider than simply just the Plan Change 77 area.

Overall, the proposal will contribute to well-functioning urban environments at a localised, district and regional scale.

15. *Please provide a more thorough assessment of how the request supports an urban environment that supports the reduction in greenhouse gas emissions and is resilient to the current and future effects of climate change, as required by Objective 8 and Policies 1 and 6*

**Our Response:**

New urban development can contribute to reduced greenhouse gas emissions if it is situated close to and is well connected to existing urban facilities and services (shops, community and recreational facilities etc.) and employment areas, including by public transport and active transport modes (walking and cycling). The Site is suitably placed in this regard. It has easy and convenient access to the existing West Melton shops and school on the north side of the West Coast Road; and to the community centre, preschools, Domain and West Melton Tavern. NZTA proposed upgrade at the West Melton Road/SH/Weedons Ross Road intersection will improve the efficiency and safety of this intersection, facilitating pedestrian movements across the SH and resolving SH severance issues which have hampered development of the township to date.

West Melton is a Service Centre in the District's township hierarchy, and as such there will be a reliance on neighbouring larger centres for higher order retail, community and service needs. However, West Melton is well positioned in this regard as it is close to both western Christchurch and the rapidly growing District Centre at Rolleston.

The Site layout can be designed to support future public transport, with the widths of primary and secondary roads wide enough for a bus stop. There is currently a public bus service between West Melton, Darfield and central Christchurch with various bus stops at West Melton. There is also a private school bus service into Christchurch.

West Melton is close to a number of significant employment hubs including Rolleston north industrial development (Izone and Iport), Darfield (including Fonterra dairy factory), Christchurch International Airport, Hornby and Islington.

Further, the Site is an inland site away from major rivers, it is not at risk from climate change induced extreme natural hazards events like sea level rise, or river flooding.

16. *Please provide an assessment of the building heights and densities proposed in the request relative to Policies 3(d) and 1(a). This assessment should demonstrate, in terms of the proposed densities, what the differences are on the ground between 12 and 15hh/ha and how the proposal provides for a variety of homes that meet the needs of different households, including all age groups.*

Our Response:

The ODP has been designed to accommodate several medium density housing locations, which will provide a greater mix of house types and price points, and enable the minimum density of 12hh/ha to be met. This will be achieved through enabling different housing typologies (i.e. duplexes, multi units/level complexes), which will be better suited to differing age groups (as opposed to single standalone units) providing for greater variety in households and age groups.

The proposed LZ development will broaden the range of housing options available and will in particular include more opportunity to 'age in place' due to the provision of smaller sites. As, the site is within easy and convenient walking/cycling distance to the existing West Melton shops and the school; on the north side of the West Coast Road; and to the community centre, preschools, Domain and West Melton Tavern, it is considered that the Site is well suited to enabling MD areas. Further, the Site layout can be designed to support future public transport in the fullness of time.

Building heights will be guided by zoning rules which generally allow for 2 storey dwellings. The minimum 12hh/ha requirement will not alter this. To achieve an achieve an overall density of 15 hh/ha a height increase of 1 storey may be required in MD areas – however, the comprehensive MD design process and associated rules already enable this as designs are assessed via a resource consent based on in context and on 'design merit'.

17. *The Council's Urban Designer considers the proposal is missing an assessment of the western boundary in the context of what will be a rural-urban interface. Such an assessment is required and needs to extend to a discussion of the current land uses and potential reverse sensitivity issues, as well as discuss any mitigation measures proposed.*

Our Response:

As detailed in **Appendix D,** the western boundary to the rural environment will shift westwards. The interface with the rural environment does not require specific mitigation measures as the

rural farming activities and the residential activities are fairly compatible. LZ zone allows for a variety of lot sizes and it is proposed to place slightly larger lots along this internal boundary to the rural environment. This allows for a larger setback for dwellings and space for planting on private property so individual owners can create their own landscaped boundary treatment to achieve privacy and shelter if desired.

To achieve a cohesive and rural appearance consistent open style rural fencing is proposed along the rural boundary. In combination with the individual landscape treatment this will create a cohesive appearance with a good level of variety in landscape treatment

In addition, the western boundary is visually broken into 4 segments by proposed future linkages creating gaps in the built environment. These linkages have been added to futureproof the development and be able to provide connectivity should urban growth extend further west over time. These future links also allow viewshafts from the development into the rural environment to the west enhancing the internal amenity for residents.

18. *The application also needs to include a character assessment of the site, including visual impact (e.g., loss of outlook) on existing residential sections in West Melton (Shepherd Avenue).*

**Our Response:**
The urban design report included a description of the site and general site characteristic.

A full character assessment of the Site and the receiving environment as well as a visual impact assessment with a focus on residents is currently being prepared. We estimate that Council will be in receipt of this in approximately 2 weeks.

19. *Discussion on SH73 interface and more specifically how the proposed response will create a more urban streetscape/entry into the town. The proposed layout is designed to create buffer for immediate relief from SH73 rather than an integrated solution.*

**Our Response:**
As detailed in **Appendix D** of this RFI, the intersection upgrade at the centre of West Melton with traffic lights and good pedestrian and cycle crossings will go some way towards overcoming the north-south severance SH73 has been allowed to create. The older community focused domain, community centre and other facilities in the south will now slowly be able to reconnect with the residential areas and the new commercial centre to the north.

As a result, the role of SH 73 will gradually change from a 'through road' to a town centre 'main street'. As such it is be reasonable to assume that upgrades will occur along this stretch of the SH73, new footpaths and landscaping will be added to improve the amenity and safety for pedestrian and that traveling speeds will reduce drastically. SH73 will become an important link for the development not only to the town centre but also to the southern parts of West Melton.

Refer to ODP narrative for SH treatment.

**20.** *Clarification on proposed Medium Density areas and how single lot only & not comprehensive is considered appropriate to meet both the density target and also achieve a variety of housing options.*

**Our Response:**

As stated in Appendix D of this RFI response, and as further commented on in items 8 and 16 above, Medium Density areas are designed and located to accommodate comprehensive medium density developments. The comprehensive MD will be the more suitable development option to achieve the desired densities within the West Melton context, as it will be able to respond to matters of character and amenity through the comprehensive design process. However, this should not mean the exclusion of small lot MD as there will most likely be scenarios where this type of MD will be able to be integrated into the 'standard' layout on smaller lots. This will also add to the variety and affordability of housing.

**21.** *Please update the ODP/Explanatory text to refer to the risk areas and the matters required to be fulfilled as part of any subsequent consent application to subdivide the property.*

**Our Response:**

A Preliminary Site Investigation undertaken identified two areas within 1234 West Coast Road, that are at risk contamination by heavy metals. Further detailed investigations are required into this at the time of subdivision.

This area of potential risk has not been identified on the ODP. If required this matter could be inserted into the supporting narrative of the ODP, potentially under the heading 'introduction'.

**22.** *Please provide the peak water demand generated by this proposed development in litres per second (l/s) and the basis for calculating this.*

**Our Response:**

Please refer to **Appendix E** which addresses this matter.

**23.** *Please comment on the feasibility of being able to transfer consented water allocation as per Section 6.3, Option 3.*

**Our Response:**

Please refer to **Appendix E** which addresses this matter.

24. *Should a new bore and treatment plan be required as per Section 6.3 Option 3 please confirm that a utility lot can and will be provided within the proposed plan change area. This should also be referred to on the updated ODP/Explanatory Text.*

**Our Response:**

Utility allotments can be incorporated at the subdivision stage if required. This level of detail will be determined at a later stage during Subdivision and Land Development. Community water supply and a pump station can be easily accommodated within the south-eastern quadrant of the Plan Change area.

25. *Please provide the peak discharge flow rate of wastewater generated from this site in l/s and the basis for calculating this.*

**Our Response:**

Please refer to **Appendix E** which addresses this matter.

26. *Please provide an estimate of the wastewater storage volume required for Section 5.3, Option 2 (SDC vested pump station with storage – pumping outside peak times) and a comment on the feasibility of this option.*

**Our Response:**

Please refer to **Appendix E** which addresses this matter.

27. *Please comment on the feasibility for this proposed plan change area to be serviced by a pressure main pumping directly to the Rossington Drive wastewater pump station.*

**Our Response:**

Please refer to **Appendix E** which addresses this matter.

28. *Please show the locations of the existing water races within the site on the ODP.*

**Our Response:**

The Applicant is in the process of closing the existing water race on 1234 West Coast Road. It is expected that in an urbanised environment that these wateraces will not be required and it is worth noting that they all are "end of line" supplies and that no parties are relying on the transmission of water through the proposed urbanised areas. Notwithstanding, the following commentary has been added to the ODP narrative.

*There are two local/lateral water races in the middle to north of the ODP area that are part of the Paparua Water Race Scheme. Any Subdivision and road design will account for the*

*presence of the water race, ensuring its ongoing function is not compromised until the water race isclosed with the appropriate agreement with Council and affected landowners.*

Other matters

We acknowledge the recent announcement on the Resource Management (Enabling Housing Supply and Other Matters) Amendment Bill which may need to be incorporated into the proposed Plan Changes at a later date. We await guidance from Selwyn District Council in respect of this matter.

# APPENDIX A | Owners Notification Letter

# Marama Te Wai Limited

Wednesday, 14 October 2021

Dear Owner,

In December 2020 Marama Te Wai Limited applied for a zoning change that may benefit your property. While you may have received a consultation letter from us in February 2021, we wanted to follow up with you to seek your comments on the proposal should you wish to participate in the process.

You can read about the application online at the Selwyn District Council web site at www.selwyn.govt.nz

If you want to go straight to the application use https://tinyurl.com/westmeltonplanchange

The plan change essentially asks that the land is rezoned from rural to residential.

The benefits to you as a property owner are:

1. Retain your property as it is; AND
2. Receive a substantial increase in the value of the underlying land; AND
3. Be able to subdivide all or part of the land to generate funds

The process to rezone the land will take place over the next year or so.

Ultimately this rezoning if successful will release further land which will ease the housing shortage in the area and help realise the dreams of many New Zealanders for home ownership and security in their future.

If you would like to contact us directly with comments and/or helpful suggestions, please email admin@inovo.nz

We look forward to hearing from you.

Thank you,

*Marama Te Wai*

Marama Te Wai Limited

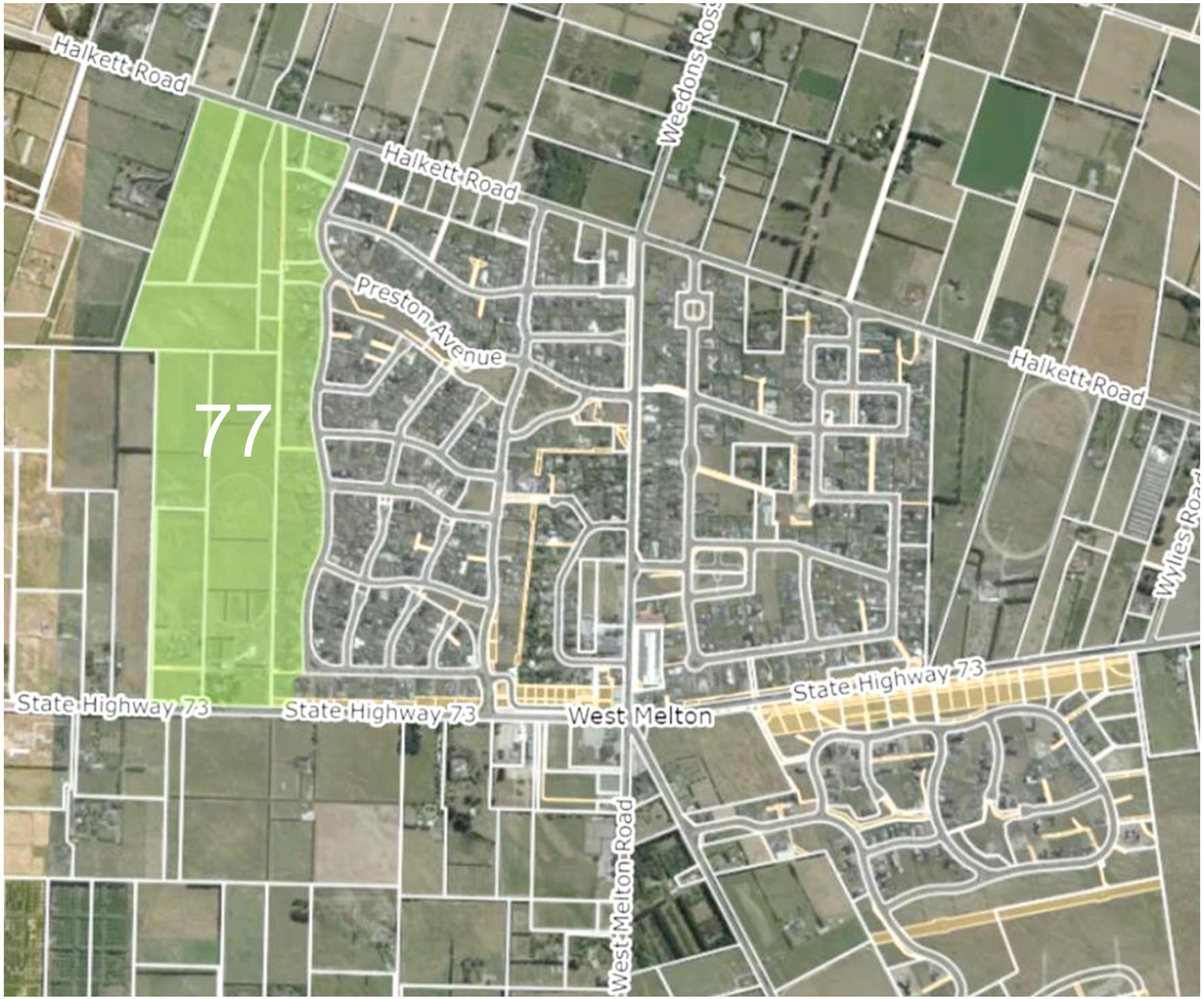
PS Remember this plan change will provide you and others future security.

# APPENDIX B | NZTA CONSULTATION


# Plan Change 77, West Melton

*Consultation with Waka Kotahi | NZ Transport Agency, Wednesday, 20 October 2021*

1. Introductions
2. Plan Change 77
3. Transport and access proposals incl. SH73 connection
4. Other matters
5. Questions




# Locality Plan (Aerial)


# 02

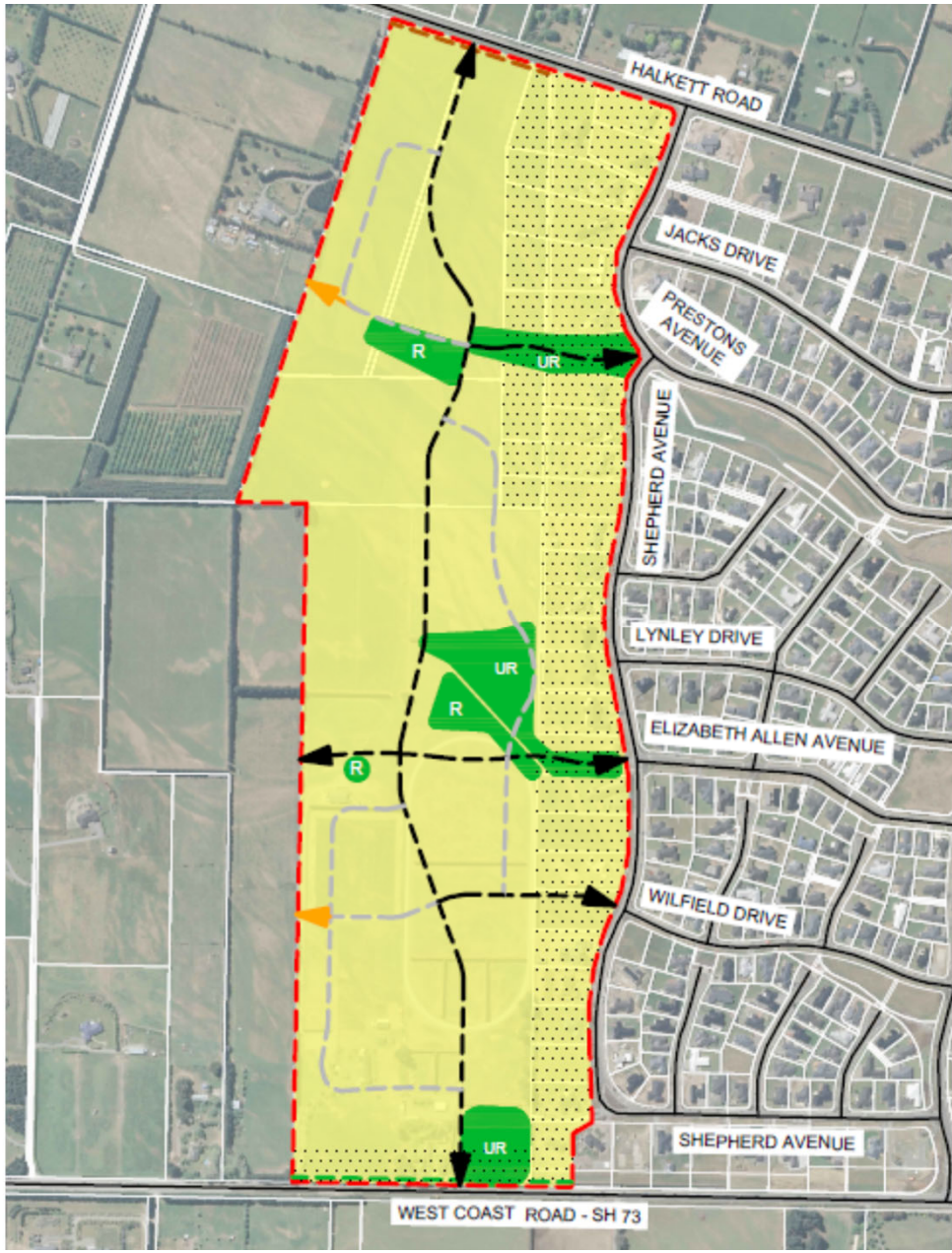
# West Melton Plan Change Areas under Review

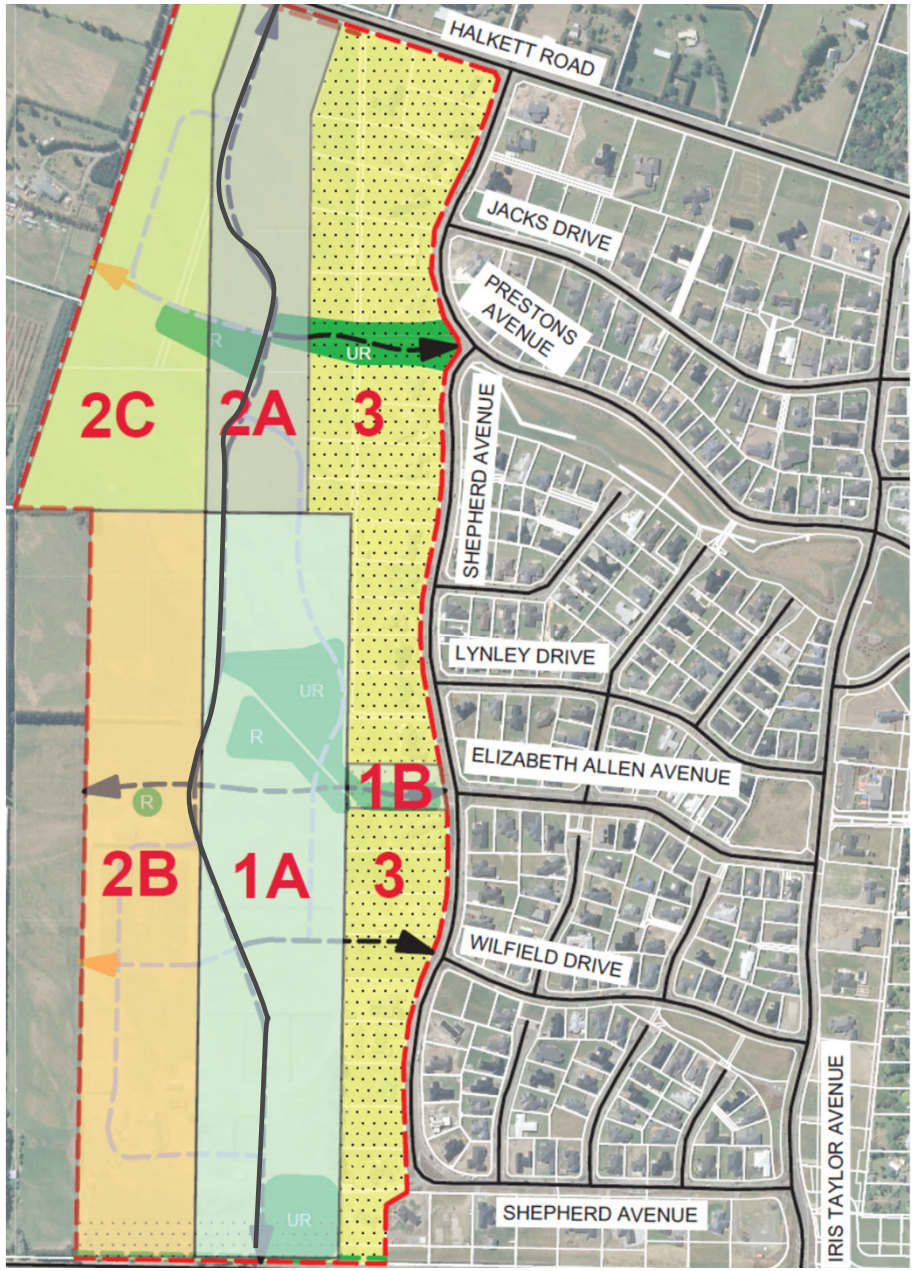
# PC77 Scheme Layout

- 50-ha site
- 500+ dwelling units
- Main N-S spine (collector)
- Secondary E-W spines (local roads)

- Outline Development Plan Area
- Fixed Road
- Indicative Road
- Possible Road
- Possible Road or Cycle/Pedestrian Route
- 12m Landscape Strip - No Vehicular Access
- Continuous Rural Style Boundary Fence

- General Residential Zone
- Large Lot Residential Specific Control Area 2 (1000m² Average Minimum 800m² )
- R — Reserve Location (size to be determined at time of subdivision)
- UR — Possible Utility Reserve Location (size to be determined at time of subdivision)






# Indicative Staging

- Stages 1A & 1B
- Stages 2A & 2C
- Stage 2B
- Stage 3

# SH73 Intersection Proposal

- Proposal to implement a priority T-intersection with right-turn bay consisting of:-
  - 20-m long right-turn pocket length, and
  - 180-m long diverge taper in advance of right-turn pocket

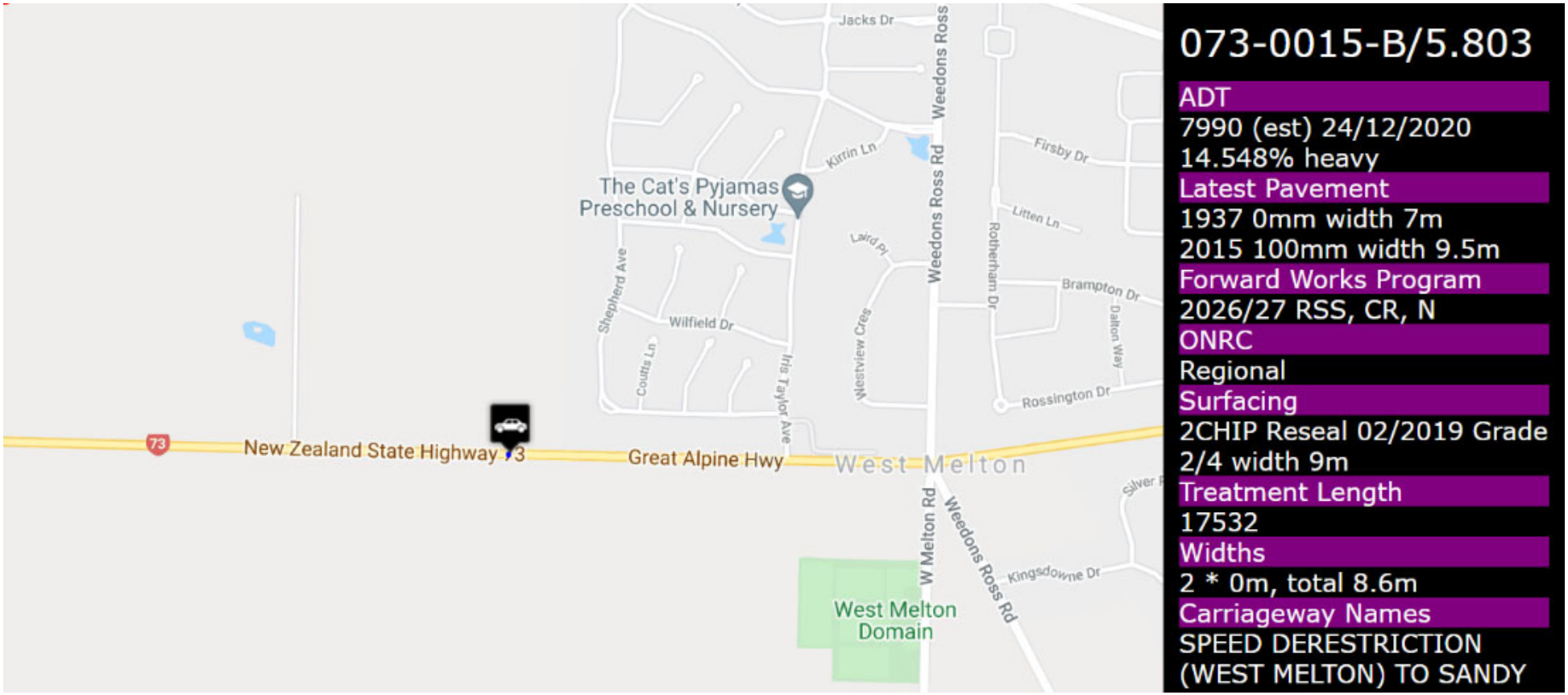
- Straight alignment either side of the proposed SH73 connection location provides uninterrupted sight distances

(Note: All comments relate to the current posted speed restriction of 100-km/h).

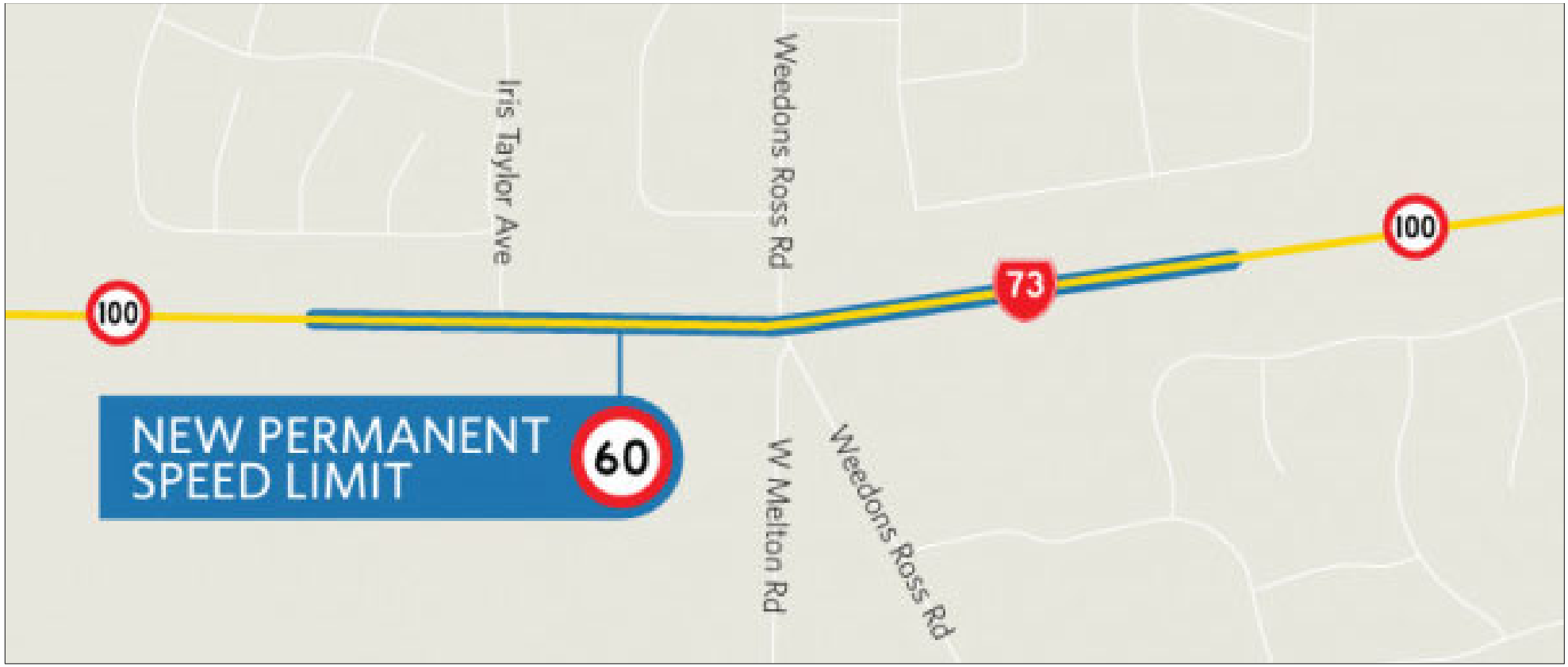

# SH73: View to East


# SH73: View to West


- **Min. 285-m Safe Intersection Sight Distance achieved.**
- **NZTA Planning and Policy Manual specify a min. accessway spacing of 200-m. Note that only the existing accessway to the west is marginally deficient (approx. 176-m). Iris Taylor spacing > 500-m.**

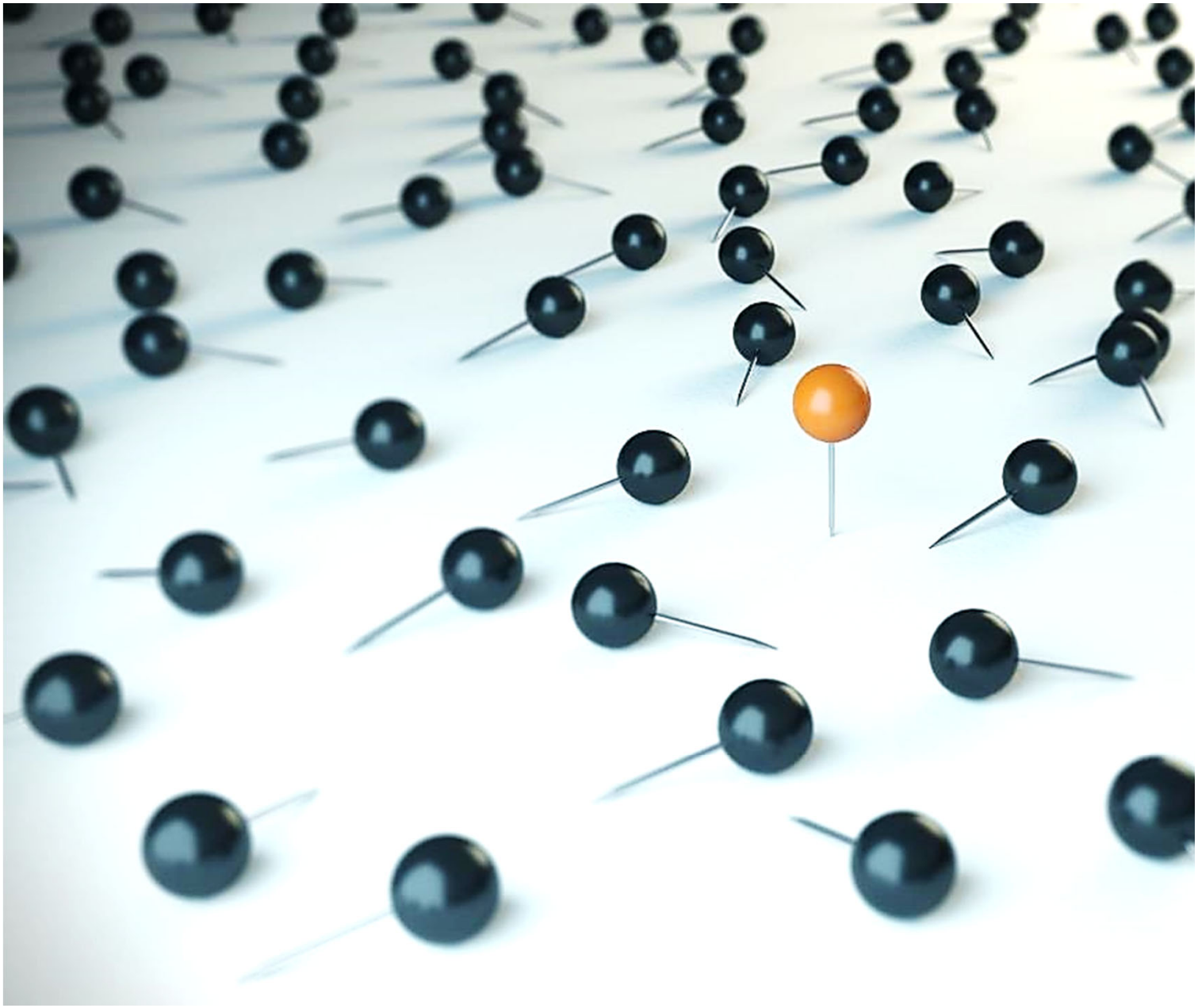



# SH73 details from Mobile Road




**Safe Network Programme – speed management: The posted speed limit reduced from 70 to 60 km/h from 20 October 2020 as per Waka Kotahi's Speed Review and in alignment with the NZ Road Safety Strategy, Road to Zero 2020 – 2030.**


# NZ Upgrade Programme: SH73/Weedons Ross Road intersection to be upgraded from priority to signals control.



# Questions?

12 October 2021

Waka Kotahi | NZ Transport Agency
Level 1, BNZ Centre
120 Hereford Street
CHRISTCHURCH 8140

**Attention:** **Mr. Richard Shaw <richard.shaw@nzta.govt.nz>**
Team Lead South – Poutiaki Taiao | Environmental Planning, Transport Services

Dear Mr. Shaw,

**Plan Change 77, 1234 West Coast Road, West Melton, Selwyn District**

This letter serves as initial form of engagement with Waka Kotahi regarding the proposed residential subdivision in West Melton as per Plan Change 77 (PC77) and in particular the proposed connection off State Highway 73 (West Coast Road).

The location to which this application relates is an approx. 50 ha site located on the western edge of West Melton with frontage to SH 73 and Halkett Road. The location of PC77 in relation to West Melton and other current plan change applications is shown in **Figure 1**.

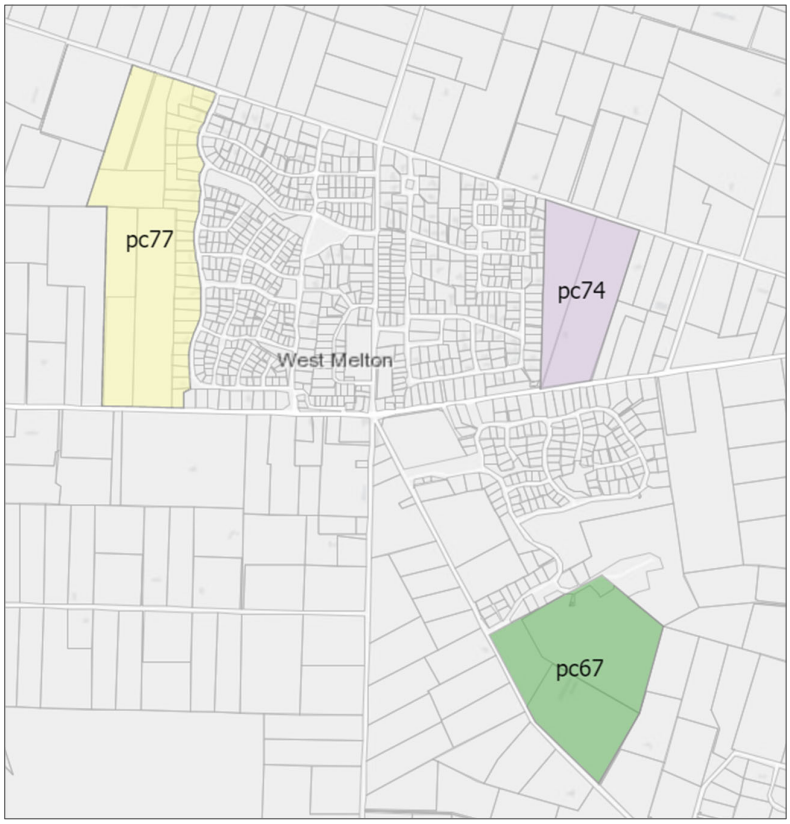



**Figure 1: Locality plan showing location of PC77 in relation to West Melton**
*Source:*
*https://www.selwyn.govt.nz/property-And-building/planning/strategies-and-plans/selwyn-district-plan/plan-changes*

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**Plan Change Application**

Copies of the Plan Change Application and the Outline Development Plan prepared by Aston Consulting is attached as **Annexure A** and **Annexure B**, respectively.

The Plan Change seeks to amend the Operative Selwyn District Plan (OSDP) to enable development of the approx. 50 ha site (the Site) for residential purposes, including some medium density lots in a sustainable and integrated manner that will provide for the needs of the West Melton and Selwyn community.

The legal descriptions and addresses of the land to which this application relates, are as summarised in **Table 1**:

**Table 1: PC77 Property Particulars**

| Appellation | Address | Surveyed Area (ha) |
|---|---|---|
| RS 6619 | 1234 West Coast Road | 12.5452 |
| Lot 1 DP 471561 | 1252B West Coast Road | 5.1920 |
| Lot 2 DP 525046 | 1252A West Coast Road | 4.8085 |
| Lot 1 DP 525046 | 345 Halkett Road | 4.1135 |
| Lot 2 DP 528937 | 341 Halkett Road | 4.0807 |
| Lot 3 DP 525046 | 343 Halkett Road | 4.6693 |
| Various lots/sections along the eastern edge of PC77 | Preston and Shepherd Avenues | 14.4000 |
| **Total** | | **49.8092** |

*Source: Adapted from Aston Consultants, 2021 / GRIP, 2021*

**Transport Assessment**

A copy of the Transportation Assessment by Carriageway Consulting dated 14 December 2020 is attached as **Annexure C**.

**Section 8.3. Form of Intersection on State Highway 73** deals with the proposed intersection form and associated details. Relevant aspects from the text are highlighted in **bold**):

8.3.1. **In view of the traffic volumes on State Highway 73, it is considered that the proposed new intersection would need to be similar in layout to that of Iris Taylor Avenue, with an auxiliary right-turn lane being provided. The design of the intersection depends on the prevailing speeds, with a layout suited to a 100 km/h speed limit being different to one appropriate for a 60 km/h speed limit, and it is possible that the speed limit will be reduced due to the presence of the site.**

8.3.2. **In either case, there is sufficient width within the legal reserve to achieve this (20 m is available) but the current layout of the highway does not include wide shoulders and therefore there would be a requirement to widen the existing seal.**

**Section *9.7. NZTA Planning Matters*** dealt with the proposed connection off **State Highway 73** as follows (with relevant aspects highlighted in **bold**):

9.7.1. Under the NZTA Planning Policy Manual, for a highway with a 100 km/h speed limit, any new intersection is required to be assessed under its own merits and there is no minimum separation required. **However, the separation proposed to Iris Taylor Avenue is in the order of 500 m which is likely to be ample. The presence of the development of the site also creates the opportunity to lower the speed limit on the highway.**

9.7.2. The further matter is the separation of the proposed new intersection from adjacent driveways. **A separation distance of 200 m on State Highway 73, and this cannot be achieved because of existing property accesses which are likely to be difficult to relocate. That said, the property access is to a rural lot, which is likely to be infrequently used, and therefore it is not considered that adverse effects would arise from the non-compliance**.

**Section 10. Conclusions** included the following conclusions (with relevant aspects highlighted in **bold**):

10.1. This report has identified, evaluated and assessed the various transport and access elements of a proposed residential plan change to the west of West Melton. **Overall, it is considered that the traffic generated by the development of the site can be accommodated on the adjacent roading network without capacity or efficiency issues arising. Levels of service at the intersection most likely to be affected (State Highway 73 / Iris Taylor Avenue) remain satisfactory, with relatively low queues and delays. Change in queues and delays at other intersections will also be low because traffic flows are lower.**

10.2. **The crash history in the vicinity of the site does not indicate that there would be any adverse safety effects from the proposal.**

10.3. **The ODP indicates that the subdivision pattern will largely meet the requirements of the District Plan, other than in respect of the separation distances at several intersections, and sight distances at vehicle crossings close to intersections. However, both of these non-compliances can be supported at this stage and can be considered further when subdivision consents are sought**.

10.4. **Two new intersections are proposed to the north and south (Halkett Road and State Highway 73 respectively) and in both cases, the intersections are closer to vehicle crossings than anticipated in relevant planning documents. However, both driveways are lightly trafficked and at this stage it is considered that the non-compliances can be supported**.

10.5. **Overall, and subject to the preceding comments, the plan change can be supported from a traffic and transportation perspective, and it is considered that there are no traffic and transportation reasons why the plan change request could not be recommended for approval**.

**Road Network Connectivity Assessment**

A copy of the Road Network Connectivity Assessment by Stantec (8 September 2021) is attached as **Annexure D**.

This assessment reviews and builds on the Transportation Assessment prepared by Carriageway Consulting (14 December 2020). The report focussed on testing various short to longer term demand scenarios for the proposed connection to SH73 (referred to as 1234 West Coast Road or 1234WCR) as a priority-controlled T-junction with right turn bay as well as impacts on the adjacent intersections based on available information.

A summary of the assessment findings based on the client's brief is included in **Table 10.1** (as duplicated below):

**Table** Error! No text of specified style in document.**.1: Summary Table**

| Brief items by Marama Te Wai Ltd. | Findings |
|---|---|
| *Review of existing TIA prepared for PCR77 and confirm or otherwise that the likely form of intersection (similar to Iris Taylor Ave) is appropriate and traffic generation and movements are reasonable assumptions. Assume the intersection is located centrally along the site frontage.* | **The form of intersection proposed for 1234WCR (copy of the existing Iris Taylor) is appropriate in the short to medium term, using traffic level of service and peak hour movement delays as defining performance measures**.<br><br>Replicating the TIA 2020 and 2030 models yield approximately the same delay and LOS results.<br><br>There are several assumptions which influence Level of Service at the intersection, such as trip generation and growth on SH73.<br><br>The intersection still operates at an adequate level of service at 2055 if trip generation remains a moderate 0.9 trips/dwelling/hr but experiences high right-turn out delays by 2045 if trip generation is the higher extreme of 1.4. |
| *Modelling of the intersection to determine performance based on the whole PCR 77 area traffic coming through here; and if required, determining what volume of traffic would get an acceptable level of service.* | If other proposed connections within the proposed subdivision are severed so that the only access is to 1234 West Coast Road:<br><br>If 100% of the development traffic is directed solely to SH73, the intersection still operates well in 2030 but is performing poorly in the 2045 AM peak with delays exceeding 3 minutes.<br><br>Poor level of service (F) begins to occur in the following scenario morning peaks where the new subdivision is restricted in size:<br><br>• 2045 - 90% (equates to about 425 trips/peak hour, assuming 0.9 trips generation)<br>• 2045 – 60% (equates to about 425 trips/peak hour, assuming 1.4 trips generation)<br>• 2055 - about 65% (about 300 trips/hr at a generation rate of 0.9 trips/dwelling) |
| *Advise on whether there will be impacts due nearby intersections (Iris Taylor Ave) and what the proposed signals at Weedons Ross Road might have on the development and the performance of this intersection* | **Iris Taylor/SH73:**<br><br>**As a base-line check, with no new development, the existing Iris Taylor intersection operates adequately beyond 2050 (but if trip generation grows as high as indicated by CAST, then Iris Taylor will experience LOS F movements between 2045 and 2055).**<br><br>For the fully-connected scenario as assessed in the ITA, where new subdivision traffic travels via both 1234WCR and Iris Taylor, then LOS F is experienced by 2045 during the morning peak. LOS F will be reached earlier if the Preston subdivision generates increased trips as indicated by CAST. The intersection is impacted by both the extra internal traffic, and the extra southbound traffic originating from 1234WCR.<br><br>For the severed connection scenario, Iris Taylor is impacted by the large volume of AM traffic exiting the solitary 1234WCR access. LOS F occurs for Iris Taylor left turn out movement in the morning peak soon after full development is reached in 2030 (this assumes 100% of the development utilising 1234WCR access).<br><br>For the severed connection scenario, the size of the development can be limited to reduce the volume of disrupting traffic. LOS F occurs for Iris Taylor left turn out movement morning peak when the subdivision is restricted in size as follows:<br><br>• 2045 – 65% (equates to about 300 trips/peak hour, assuming 0.9 trips generation) |

| Brief items by Marama Te Wai Ltd. | Findings |
|---|---|
| | • 2055 - 40% (about 190 trips/hr at a generation rate of 0.9 trips/dwelling<br>• 2055 - 0% (intersection is at capacity if CAST generation occurs in the Preston subdivision).<br>This modelling does not take into account the potential for Preston subdivision traffic to redistribute to other access points to and from the subdivision as delays and queues at Iris Taylor intersection increase.<br>The above findings assume free flow conditions on SH73.<br>The proposed Weedons Ross signals could further disrupt traffic movements at Iris Taylor and reduce its future capacity below that described above.<br>**Weedons Ross/SH73 signals**:<br>***To be confirmed, dependant on data availability of proposed signals*** |
| *The frontage is currently 100 km/h but would like to see results for 60 km/h as well, as the current 60 km/h could be extended following installation of the signals.* | **No significant effect on delays or level of service is apparent for either 1234WCR or Iris Taylor models if the local SH73 speed environment is reduced from 100 km/h to 60 km/h**. |

*Source: From Table 10.1, Road Network Connectivity Assessment. Stantec, 8 September 2021*

**Request for Further Information from Selwyn District Council**

The request for further information letter from Selwyn District Council on the Private Plan Change Request (Ref. PC200077, 27 April 2021) is attached as Annex E.

The letter states that **"The plan change request is depending on securing the appropriate connection through to State Highway 73. Given the importance of this connection and the reliance of the plan change request on it, there needs to be further advice from the appropriate road network authority (Waka Kotahi/NZTA) as to whether they will agree to another intersection along SH73 west of Iris Taylor Dr and consequently extending the 60 kmph speed limit further west to encompass it"**.

Point 5 further requests: "**Please provide details of any consultation undertaken with Waka Kotahi/NZTA regarding the proposed new intersection onto State Highway 73".**

**Request to Waka Kotahi**

Our request is for Waka Kotahi to review the proposed plan change 77 and in particular the proposed T-junction connection off State Highway 73 and advise possible constraints and/or conditions that may apply in permitting the proposed connection, as feedback into the PC77 review process.

It is noted that a formal access application is still to be lodged (pending support for the plan change) and will require further, more detailed traffic and design assessments.

Your assistance in this regard will be highly appreciated.

Please do not hesitate to contact the writer should you have any questions and/or require additional information.

Yours sincerely,

Tobie Ueckermann CEng CMEng
**Principal Transportation Engineer - Transport Advisory, Private Sector**
**Stantec New Zealand**

Encl.: Annexure A: Plan Change Application (Aston Consulting, December 2020)
Annexure B: Outline Development Plan (Ashton Consulting, December 2020)
Annexure C: Transportation Assessment (Carriageway Consulting, December 2020)
Annexure D: Road Network Connectivity Assessment (Stantec, October 2021)
Annexure E: Request for Information from Selwyn District Council, 27 April 2021

Copy to: Marama Te Wai Limited (C/o- West Melton Holdings Ltd)

# Road Network Connectivity Assessment

## 1234 West Coast Road Residential Subdivision, West Melton

**PREPARED FOR MARAMA TE WAI LTD | ISSUE 3, SEPTEMBER 2021**

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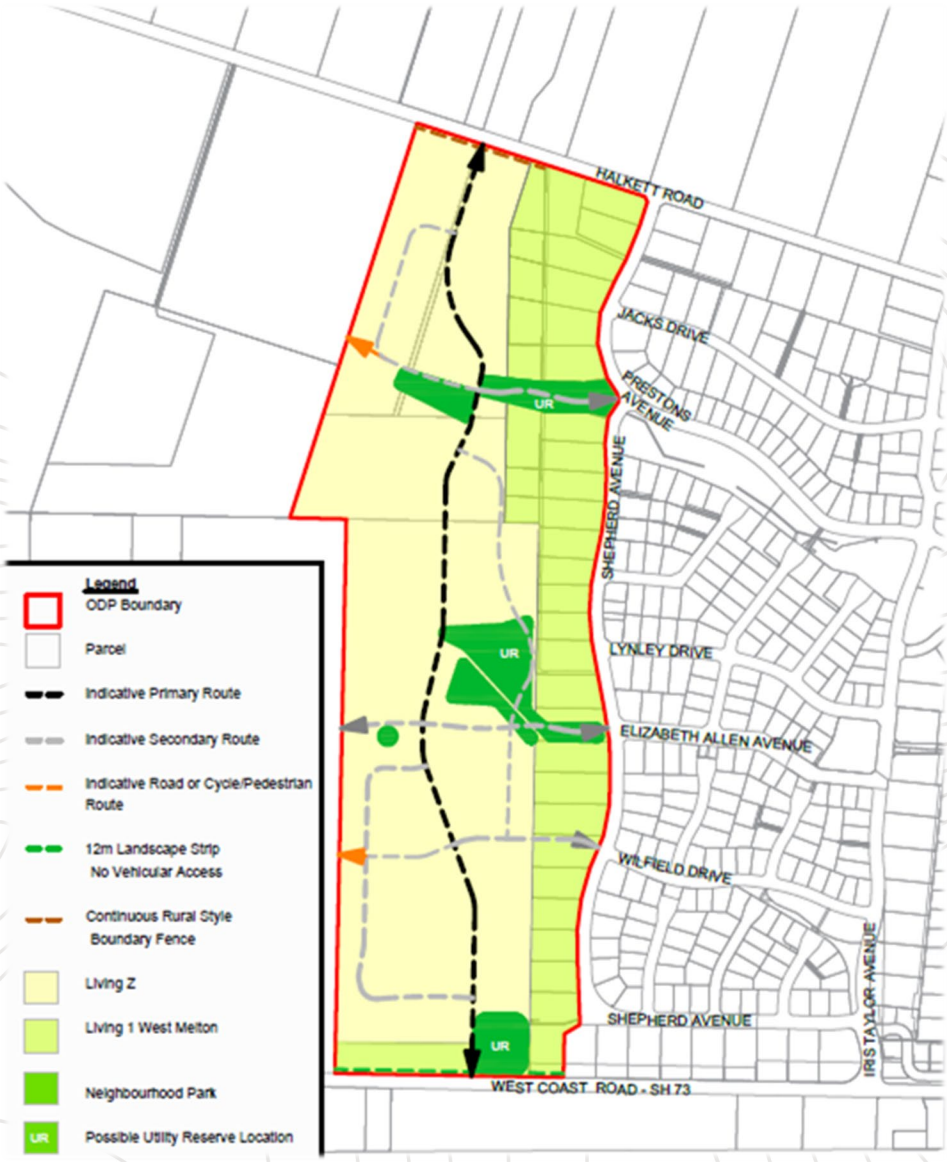
We design with community in mind




Stantec

# Revision Schedule

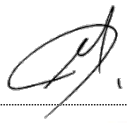
| Rev No. | Date | Description | Signature or Typed Name (documentation on file) | | | |
|---|---|---|---|---|---|---|
| | | | Prepared by | Checked by | Reviewed by | Approved by |
| 0 | 31/08/2021 | Issue 1, draft for client review | J. Watt | N. Overdevest | T. Ueckermann | N. Overdevest |
| 1 | 08/09/2021 | Issue 2, Final | J. Watt | N. Overdevest | T. Ueckermann | N. Overdevest |
| 2 | 08/09/2021 | Issue 3, Final | J. Watt | N. Overdevest | T. Ueckermann | N. Overdevest |

# Quality Statement

This document has been prepared for the benefit of Marama Te Wai Ltd. No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to Marama Te Wai Ltd and other persons for an application for permission or approval to fulfil a legal requirement.

| PROJECT MANAGER | PROJECT TECHNICAL LEAD |
|---|---|
| Tobie Ueckermann | Nick Overdevest |

| | | |
|---|---|---|
| **PREPARED BY** | | |
| James Watt |  | 07 / 09 / 2021 |
| **CHECKED BY** | | |
| Nick Overdevest |  | 08 / 09 / 2021 |
| **REVIEWED BY** | | |
| Tobie Ueckermann |  | 08 / 09 / 2021 |
| **APPROVED FOR ISSUE BY** | | |
| Nick Overdevest |  | 08 / 09 / 2021 |

**HAMILTON**
PWC Centre, Level 3, 109 Ward Street, Hamilton 3204
PO Box 13-052, Armagh, Christchurch 8141
TEL +64 7 839 0241

STATUS Issue 3 | Project No 310204767

# Table of Contents



## LIST OF TABLES

## LIST OF FIGURES

# Abbreviations

| | |
|---|---|
| NZTA (or WK) | The New Zealand Transport Agency or Waka Kotahi |
| CAST | Christchurch Assignment and Simulation Transportation model |
| CTM | Canterbury Transport Model |
| CBD | Central Business District |
| SH 23 | State Highway 23 |
| Ha | Hectare(s) |
| CCC | Christchurch City Council |
| RITS | Regional Infrastructure Technical Specifications |
| m | metres |
| km | kilometres |
| km/h | kilometres per hour |
| hr | hour |
| yr | year |
| ITA | Integrated Transport Assessment (previously known as TIA, “Traffic Impact Assessment”) |
| LoS | Level of Service |
| RAB | Roundabout |
| Max | Maximum |
| Q | Queue |
| S or sec | Seconds |
| veh/hr | Vehicles per hour |

# Glossary

| | |
|---|---|
| Level of Service (LoS) | LoS is a qualitative stratification of the performance measure or measures representing quality of service. A LOS definition is used to translate complex numerical performance results into a simple stratification system representative of road users' perceptions of the quality of service provided by a facility or service (HCM 2016). These service measures include speed and travel time, delay, density, freedom to manoeuvre, traffic interruptions, comfort and convenience, and safety. In general, there are six levels of service, designated A to F, with LOS A representing the best operating condition and service quality from the users' perspective (i.e., free-flow) and LOS F the worst (i.e., forced or breakdown flow or having reached a point that most users would consider unsatisfactory, as described by a specific service measure value or a combination of service measure values). Sourced from *AGTM03-20 Part 3 Transport Study and Analysis Methods - Austroads* |
| Saturation (or Degree of Saturation) | The concept of degree of saturation, or VCR (Volume to Capacity Ratio), is used in the capacity and operational analysis of intersections. The degree of saturation of a signalised intersection approach may be defined as the ratio of the arrival flow (demand) to the capacity of the approach during the same period<br><br>The degree of saturation of an intersection approach ranges from close to zero for very low traffic flows up to 1.0 for saturated flow or capacity. A degree of saturation greater than 1.0 indicates oversaturated conditions in which long queues of vehicles build up on the critical approaches. In general, the lower the degree of saturation the better the quality of traffic service. However, the degree of saturation, delay and queue length parameters should always be used together to assess intersection performance.<br><br>In practice the target degrees of saturation of 0.90 for signals, 0.85 for roundabouts and 0.80 for unsignalised intersections are generally agreed to. These are usually called 'practical degrees of saturation'. Sourced from *AGTM03-20 Part 3 Transport Study and Analysis Methods – Austroads* |

# 1 INTRODUCTION

This Road Network Connectivity Assessment (RNCA) report has been prepared by Stantec New Zealand (Stantec) on behalf of Marama Te Wai Limited regarding a proposed residential subdivision development at 1234 West Coast Road, on the western edge of West Melton, west of Christchurch city. The development is the subject of a private plan change request, PC77. The site is bounded by the village of West Melton to the East, Halkett Road to the North, and SH73 (West Coast Road / Great Alpine Highway) to the south.


**Figure 1.1: PC77 development area**

*Source: Selwyn District Council*[1]

This RNCA reviews and builds on a previous assessment "Proposed Residential Plan Change - West Melton – Transportation Assessment" dated 14 December 2020, prepared by Carriageway Consulting Ltd. Carriageway Consulting's assessment shall be referred to herein as the Integrated Transport Assessment (ITA).

The ITA indicates the proposed subdivision will deliver 525 permitted properties generating 472 peak hour vehicle movements. The proposed outline development plan indicates access to the wider road network will be via new intersections onto SH73 and Halkett Road as shown in Figure 1.2, and new links to the existing adjacent 'Prestons' subdivision which in turn will allow access via Preston and Iris Taylor Avenues. The ITA has assessed expected peak time trip generation for the subdivision, then assessed the direction it will travel to connect to the wider network (i.e., the distribution), and finally assessed the impact of this traffic at the connection points to the wider network. The year adopted for prediction purposes is 2030. One of the main tasks of this RNCA is to confirm the findings of the ITA.

1 *https://www.selwyn.govt.nz/property-And-building/planning/strategies-and-plans/selwyn-district-plan/plan-changes/plan-change-77,-rezone-50-hectares-of-land-from-rural-inner-plains-to-living-z-and-living-1-west-melton,-west-melton#*

The proposed subdivision has an un-named spine road that connects to both Halkett and SH73. These connections will be referred to as 1234WCR/SH73, and 1234WCR/Halkett.

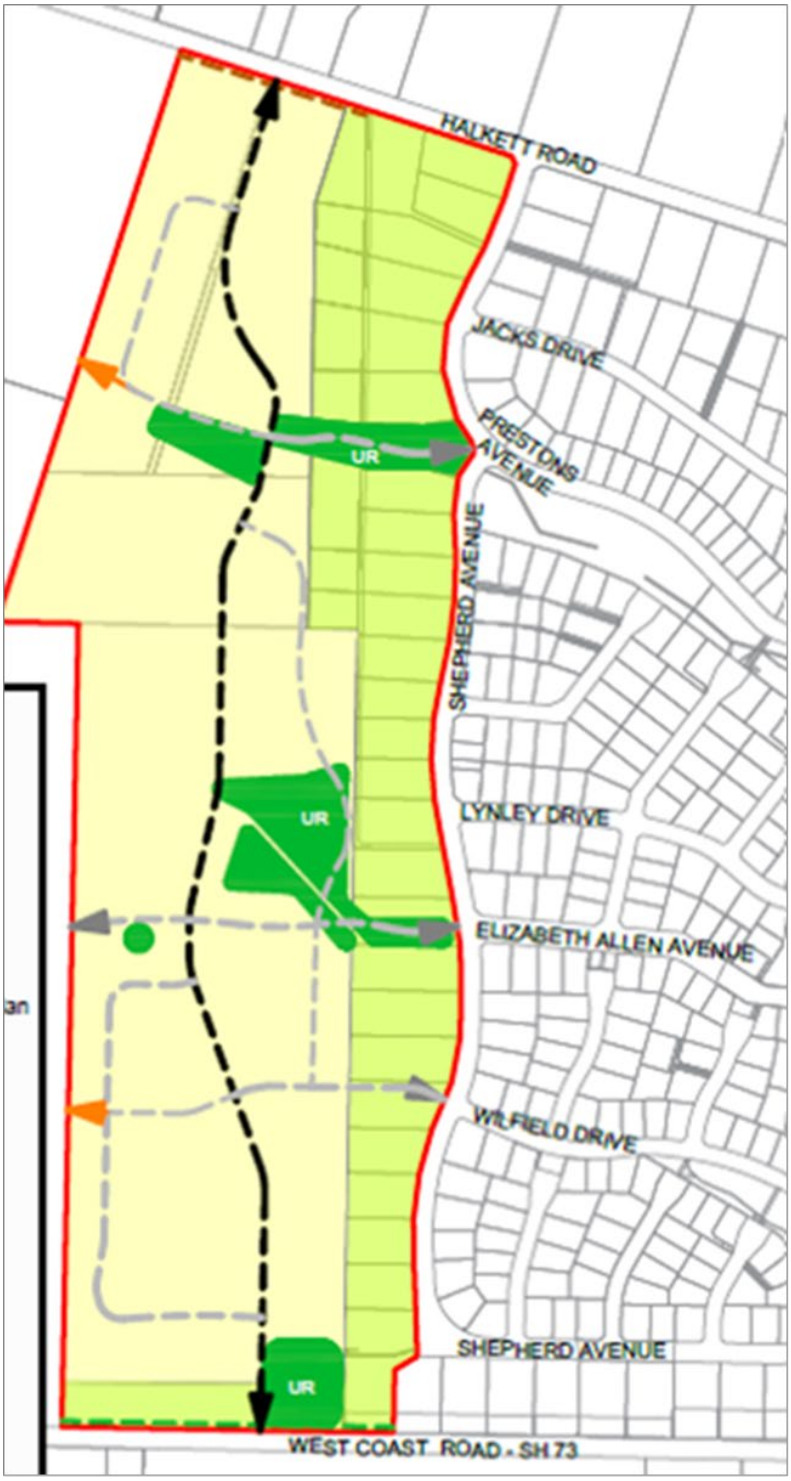



**Figure 1.2: Development areas**

*Source: Ultimate Global, 2021*

# 2 SCOPE

Marama Te Wai Ltd has identified the following scope to be addressed by this report. The scope was communicated via Russell Davies email 26 July 2021. The scope, and the methodology used to assess traffic effects, is listed below:

**Table 2.1: Brief from Marama Te Wai Ltd**

| Items | Task |
|---|---|
| 1. Review of existing TIA prepared for PCR77 and confirm or otherwise that the likely form of intersection (similar to Iris Taylor Ave) is appropriate and traffic generation and movements are reasonable assumptions. Assume the intersection is located centrally along the site frontage. | • Review trip generation used in ITA<br>• Source base regional traffic (CAST model)<br>• Review traffic distribution against CAST<br>• Review TMS and network traffic growth<br>• Develop 1234WCR/SH73 peak weekday turning models for 2030 and year 25 (2055)<br>• Develop 1234WCR/SH73 SIDRA model for ITA flows<br>• Repeat SIDRA model for above peak flows<br>• Repeat SIDRA for year 25 (2055)<br>• Repeat SIDRA for % of peak weekday flows if capacity exceeded (Risk item, to be confirmed. |
| 2. Modelling of the intersection to determine performance based on the whole PCR 77 area traffic coming through here; and if required, determining what volume of traffic would get an acceptable level of service. | • Adjust peak weekday turning model to divert all traffic via 1234WCR/SH73 intersection<br>• Repeat SIDRA for 100% development flow<br>• Repeat SIDRA for % of peak weekday flows if capacity exceeded |
| 3. Advise on whether there will be impacts due nearby intersections (Iris Taylor Ave) and what the proposed signals at Weedons Ross Road might have on the development and the performance of this intersection (I expect these are too far away to have an influence). | Assessment of Iris Taylor/SH73:<br>• Develop SIDRA for Iris Taylor adopting ITA measured flows and utilising CAST year 25 (2055) flows<br><br>Assessment of Weedons Ross:<br>• To be confirmed in further work, dependant on data availability of proposed traffic signals design. |
| 4. The frontage is currently 100 km/h but would like to see results for 60 km/h as well, as the current 60 km/h could be extended following installation of the signals. | • Repeat above SIDRA for 60 km/h on SH73 |

# 3 KEY INTERSECTIONS

Figure 2.1 shows the position of the intersections of interest. The pink intersections highlighted are existing Preston subdivision intersections that could be impacted by the new 1234 WCR development, or by future traffic redistribution towards Halkett Road. The blue intersections are the two main access points to the proposed subdivision. The red intersection is the Weedons Ross / SH73 intersection which is soon-to-be-upgraded to traffic signal control. The pink intersections on Halkett Road help to identify the distribution of traffic adopted by the CAST model.

The three key intersections of interest in this report are the three intersections with SH73 (West Coast Road):

- 1234 WCR;
- Iris Taylor Avenue; and
- Weedons Ross Road.


**Figure 3.1 Intersection Locations**

All intersections are currently priority give-way or stop controlled. However, the Weedons Ross / SH73 cross-roads is close to being upgraded to traffic signals as part of Waka Kotahi's West Melton Improvement project.

As part of that upgrade, Waka Kotahi have modified the speed limit on SH73 from 70 km/h to 60 km/h within the village. The 100/60 limit change is located 150 m west of Iris Taylor. We understand there is a proposal to extend the 60 km/h westward to include the new 1234WCR/SH73 intersection.

Assessment of effects on the current Weedons Ross priority control intersection has little relevance with an upgrade pending. Waka Kotahi has been approached to share technical design data for the proposed intersection so that we can better assess the traffic effects of 1234 WCR. Consequently, the assessment of effects on Weedons Ross intersection has not been included as part of this assessment.

# 4 ANALYSIS YEARS

The 'base' analysis year adopted in both this report and the ITA is 2030, which is when the proposed development is fully developed and thus generating its consistent maximum of traffic. In addition, for this report, a year 25 (2055) is assessed to examine the potential long term traffic effects of the development. However, predictions of traffic performance 25 years or more from now are uncertain, particularly in the absence of network model guidance such as CAST, which is limited to 2048. In 2055 the intersections perform poorly regardless of the assumptions made. Consequently, several scenarios in 2045 have been tested, as at this point the intersections begin to perform poorly (LOS F) under a number of tested scenarios. It is noted that the ITA did not test any year other than 2030.

# 5 ANALYSIS MODES

Only vehicular traffic, and the effects of vehicular traffic on intersection capacity are assessed within this report. It is assumed there are no bus requirements (either Metro or school service) that affect the choice or performance of the intersections investigated.

# 6 CAST MODEL

Within Greater Christchurch, modelling of transport is primarily undertaken using two (principal) mathematical transport models:

- The Christchurch Transport Model (CTM), a traditional four stage multi-modal model with the focus on strategic or 'high-level' area-wide modelling; and
- The Christchurch Assignment and Simulation Traffic (CAST) model, which provides a more refined focus on supply (capacity) and demand for the traffic network only - but one that is still reasonably consistent with (and dependent upon) projections of transport demand produced by the parent CTM model.

Together both models form an analytical toolkit to assess the impact of land use changes on transport infrastructure requirements in the greater Christchurch area and thus the potential efficacy of land use changes, or transport infrastructure - or both in combination.

Forecast from the CAST model have been used for this assessment for the years 2028, 2038, and 2048. The model version is referred to as "v18a" and is based on estimated 2018 land use data (i.e., not data from the 2018 Census which was not available when this model update was produced).


**Figure 6.1 CAST Model Link map**

This report adopts the CAST model as it is more detailed and importantly includes the existing Preston subdivision. Results from the 2028, 2038, and 2048 CAST model years are interpolated to provide year 2030 (end of development, year zero), 2045, and 2055 (end of development + 25 years).

A feature of the CAST model is that Weedons Ross/SH73 is modelled as a cross-roads signals with a single through lane and right-turn lane for each approach. This closely matches the current signal design proposal. This gives some confidence the distribution model will reasonably reflect the delay effects of the new signals.

## 6.1 PEAK PERIODS

This review is primarily concerned with capacity and therefore concentrates on times of highest flow – the weekday morning and evening peaks. The principal opposing flow that causes congestion at the various SH73 intersections of interest are the high SH73 commuter through flows, and so the peak times of interest are when those flows peak locally. Christchurch city has an accepted peak period of 7 to 8 am and 5 to 6 pm, however, traffic peaks further out from the city can occur earlier in the morning and later in the evening. To check this, traffic profiles from historic counts on SH73 have been examined to a 15-minute increment to determine the best peak to adopt. These profiles are available at fixed count stations on SH73 located at:

**Table 6.1: Traffic Commuter Peak Hours**

| Peak Hour | Count Station:<br>Dawsons Road: RP 073 5/8.43<br>(5.7km east of West Melton) | **Adopt at West Melton (approximate mid-point)** | Count Station:<br>Aylesbury Road RP 073 15/12.76<br>(6.9km west of West Melton) |
|---|---|---|---|
| AM | 7:30-8:30 | **7:30-8:30** | 7:15-8:15 |
| PM | 17:00-18:00 | **17:00-18:00** | 17:00-18:00 |

# 7 REVIEW ITA GENERATION & DISTRIBUTION

## 7.1 TRIP GENERATION

The ITA adopted peak hour trip generation of 0.9 movements per dwelling. The ITA does not identify the trip generation source and does not offer evidence to support the adopted rate. However, 0.9 matches the generation rate for 85$^{th}$ percentile movements from NZTA RR 453 Trips and Parking Related to Land use 7.2.2 “Outer suburban dwellings”. Using this rate would assume the development generates movements in a manner similar to an outer city suburb. This has some basis, as the typical style of West Melton property is essentially large urban with relatively extensive areas of landscaped lawn.

However, West Melton is not city-urban, as it is a rural enclave located 14 km from the urban edge of Christchurch city. In RR453, Rural dwellings are considered to generate 1.4 peak hour trips. This suggests local generation could be higher than adopted. As a conservative check, this review assesses the effects of a generation rate of 1.4 veh/hr/dwelling for some 2045 tests.

Another check is to consider current trip generation in the adjacent Preston subdivision. The CAST model predicts 2028 peak hour trip generation for that subdivision is at or below the 0.9/dwelling used in the ITA. However, the CAST model predicted trips will intensify progressively (possibly due to expected land use changes) until peak hour trips at 2045 are about 1.8/dwelling.

## 7.2 TRAFFIC DISTRIBUTION

The ITA assessed a proposed development with multiple access points; direct to SH73, a connection to Halkett Road, and several internal connections to the adjacent Preston subdivision. New subdivision traffic generated was assumed to be dispersed amongst the various connections in a similar manner to the adjacent Prestons subdivision. The peak hour turning flows assessed were calculated by:

- Adopting 525 dwellings (100% development) x 0.9 trips/dwelling = 473 peak hour trips AM and PM,
- Assume 35% of total flow will migrate to and from the new intersection with SH73, and
- Assume the turning proportions in and out of the intersection will match that of the adjacent Iris Taylor tee-intersection. Existing Iris Taylor turning was observed as part of a 2016 peak hour count.

This appears to be a reasonable approach to take.

However, it relies the assumption that the new development will match the Preston subdivision traffic patterns, and, on a "gut feel" distribution of the existing Preston internal distribution. This is difficult to predict, as there are six corridors which the newly generated traffic could disperse to; these are east and west on SH73, east and west on Halkett Road, and north and south on Weedons Ross Road (West Melton Road is expected to be closed off as part of the Weedons Ross/SH73 signals improvements). Therefore, as a check we have compared this Preston traffic distribution assumption against the CAST model distribution. In theory, the CAST model should consider the future redistribution effects of the new Weedons Ross traffic signals, and so might be slightly different to that measured by the ITA. Assuming 1234WCR will have a connection to Halkett Road, peak hour delays imposed on SH73 traffic by the signals may tend to encourage 1234 WCR city-bound traffic to divert to Halkett Road, which is almost as direct.

The CAST model has been examined to determine if its traffic distribution pattern for the existing West Melton Subdivision matches the distribution pattern adopted in the ITA. The CAST model distributes traffic as follows:

**Table 7.1: CAST model traffic distribution within Preston Subdivision**

| | % Trips to/from SH73, either direct or via side road | | |
|---|---|---|---|
| | ITA | CAST | |
| Year | 2030 | 2030 | 2045 |
| AM | 60% | 73% | 71% |
| PM | 60% | 74% | 73% |

The CAST model indicates there is a slightly higher desire to travel to and from SH73 than modelled in the ITA assumptions (about 73% vs. 60%). If this is reflected in the travel patterns for the new 1234WCR development, that means about 73% of generated traffic will travel mainly via the 1234WCR/SH73 intersection, or secondly via Iris Taylor/SH73 intersection.

If further confirmation is required, the current direction of generated traffic could be assessed after undertaking simultaneous peak hour turning counts at the five existing subdivision access points (Preston/Halkett, Iris Taylor/Halkett, Preston/Weedons Ross, Jacks/Weedons Ross, and Iris Taylor/SH73) to determine a representative balance.

## 7.3 SH73 TRAFFIC

The SH73 through-volume used in the model to check intersection performance is critical, as these volumes provide the bulk of opposing movements that create congestion at the intersections of interest. The ITA adopts SH73 traffic volumes based on a local 2016 peak hr traffic turning count at Iris Taylor intersection, extrapolated to 2030 using projected growth of 1.7% sourced from the nearby Aylesbury Road count station. Only the above description is provided in the ITA, the actual volumes modelled are not reported.

There are two other sources that can be used to check future through volumes:

- CAST Model
- SH73 traffic count stations,

The two count stations on SH73 are about 13 km apart with West Melton in the middle:

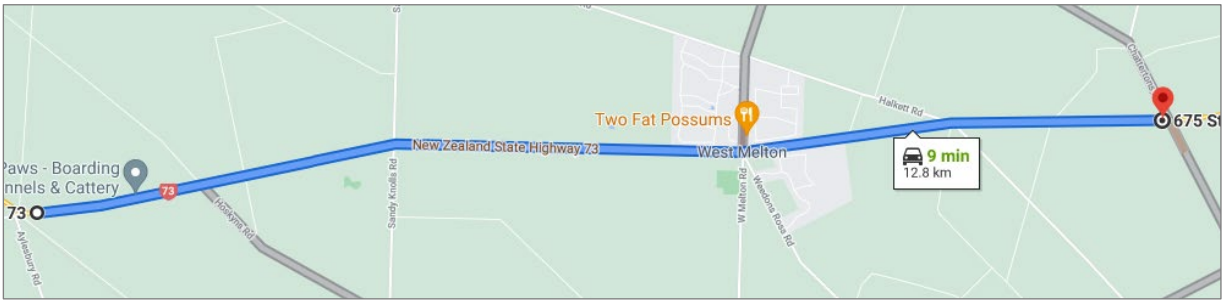



**Figure 7.1: Traffic count station locations**

The traffic used in the ITA can be compared to other sources as follows:

**Table 7.2: SH73 Weekday Peak Hour traffic volumes**

| Source | Peak | 2020 Growth %p.a. | Peak hr volumes SH73 west of Iris Taylor | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 2020 | | 2030 | | 2045 | |
| | | | Eastbnd | Westbnd | Eastbnd | Westbnd | Eastbnd | Westbnd |
| 2016 Count extrapolated 1.7% | AM | | **619** | 283 | **716** | 326 | **862** | 392 |
| | PM | | 384 | **579** | 542 | **669** | 523 | **799** |
| Aylesbury Road Count Station (73 on the Map) | AM | 1.5% | 377 | 263 | 436 | 303 | 610 | 425 |
| | PM | | 304 | 421 | 351 | 486 | 491 | 681 |
| Dawson Road Count Station (675 on the Map) | AM | 1.6% | 896 | 258 | 1034 | 298 | 1256 | 361 |
| | PM | | 331 | 737 | 382 | 851 | 464 | 1033 |
| Aylesbury/Dawson Average | AM | 1.5% | **637** | 260 | **735** | 301 | **892** | 365 |
| | PM | | 317 | **668** | 366 | **771** | 445 | **936** |
| CAST | AM | | | | 534 | 292 | 619 | 348 |
| | PM | | | | 299 | 445 | 351 | 555 |

The comparison shows that the ITA predicted **morning** dominant flow into the city matches well with the count station average eastbound flow. However, this flow is somewhat higher than the city-bound flow predicted by CAST, by some 30%. This implies adoption of the ITA or Count station average SH73 flow is robust.

The comparison shows that the ITA predicted **evening** dominant flow away from the city is lower than the count station average westbound flow by some 10-15%. However, this flow is somewhat higher than the city-exiting flow predicted by CAST, by some 50%. This implies adoption of the Count station average SH73 flow is the most robust test.

There is still some uncertainty over the count station flows. Although the stations are only 13 km apart, traffic more than doubles at the station closer to the city (Dawsons), meaning that there is potential for significant uncertainty in the vicinity of 1234 West Coast Road. A key refinement for all capacity tests at the West Melton intersections of interest would be to conduct simultaneous traffic counts west of Weedons Ross Road and at the two count stations to better establish the proportion of residual highway traffic present at 1234 WCR.

# 8 IRIS TAYLOR/SH73 INTERSECTION MODEL & SIDRA

## 8.1 TRAFFIC MODEL USING CAST

An AM and PM traffic model has been developed for the Iris Taylor/SH73 intersection, incorporating the following:

- Existing traffic volumes as predicted in the ITA for 2030,
- Addition of the proposed development traffic generated at 0.9 trips/dwelling,
- Tested at year 2045 and 2055.
- Tested with 100%, 65% and 40% of development traffic accessing SH73 directly
- Tested using a 2045 CAST distribution and trip generation output

CAST traffic volumes on SH73 have not been tested directly as these are generally lower than the values predicted by the traffic counters. The CAST peak hour volumes appear to be less than the peak volumes recorded for 2020.

Note that the ITA only models Iris Taylor, it does not model the new 1234WCR access. It (correctly) identifies Iris Taylor intersection as more vulnerable than the proposed 1234WCR access due to its higher traffic load. The implication in the ITA is that if Iris Taylor can function adequately with the extra traffic load imposed by the development, then an identical format intersection at 1234 WCR with less traffic load will also work fine.

## 8.2 IRIS TAYLOR CAPACITY CHECK

The Iris Taylor intersection (see Figure 8.1) has been modelled in SIDRA v9 as the existing priority control Give-Way, to check peak weekday capacity.


**Figure 8.1: Aerial view of the Iris Taylor Avenue intersection**

We have attempted to emulate the reported results in the ITA, but we do not have access to the exact SIDRA format adopted (i.e., lane configurations, % bunching factor, etc), calibration data, nor the exact traffic data (i.e., % PFF and % HCV). As a result, our model outputs only approximate the ITA results.

The modelling does not include modelling within CAST i.e., inserting the proposed network into CAST and then running CAST to new development will distribute. Only the existing CAST network is used. CAST outputs are examined to see how the existing Preston subdivision is treated, and then similar assumptions made for the proposed 1234WCR development.

Model results are listed below in a similar manner to the ITA to aid comparison. Only opposed movements are reported. Movements performing below the required service levels are highlighted in **orange** and very poorly (well above available capacity) highlighted in **red.**

The modelling assumes free flow conditions on SH73, as per the existing village layout. This means it is assumed that nothing is happening on SH73 to further restrict (or improve) access for Iris Taylor intersection traffic, which appears to be consistent with the approach in the ITA. However, there is the possibility that the new Weedons Ross signals will disrupt peak hour traffic, creating tailbacks that adversely impact the performance of Iris Taylor. These tail backs have not been allowed for in the modelling and the result of sustained tailbacks could be that Iris Taylor performs worse than described below:

**Table 8.1: Iris Taylor intersection performance (Years 2020 and 2030)**

| Test Description 2020 & 2030 | Movement | | Morning Peak Hour | | | Evening Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service |
| 1. 2020 Existing Intersection ITA 5.1.9 | SH73 (east) | R | 7.8 | 0.1 | A | 7.2 | 0.3 | A |
| | Iris Taylor Avenue | L | 7.3 | 0.8 | A | 5.8 | 0.3 | A |
| | | R | 14.2 | 0.8 | B | 14.4 | 0.3 | B |
| 2. 2030 Existing Intersection ITA 5.1.11 | SH73 (east) | R | 8.3 | 0.1 | A | 7.3 | 0.3 | A |
| | Iris Taylor Avenue | L | 10.1 | 1.3 | B | 6.5 | 0.4 | A |
| | | R | 18.5 | 1.3 | C | 17.8 | 0.4 | C |
| 3. 2030 1234WCR development added ITA 8.1.1 | SH73 (east) | R | 9.1 | 0.1 | A | 7.6 | 0.5 | A |
| | Iris Taylor Avenue | L | 16.5 | 3.5 | C | 7.0 | 0.6 | A |
| | | R | 30.4 | 3.5 | D | 24.2 | 0.6 | C |
| 4. 2030 1234WCR development added 100% direct access to SH73 | SH73 (east) | R | 11.5 | 0.1 | B | 7.9 | 0.4 | A |
| | Iris Taylor Avenue | L | 38.3 | 4.2 | E | 7.6 | 0.6 | A |
| | | R | 65.5 | 4.2 | F | 37.1 | 0.6 | E |
| 5. 2030 1234WCR development added with CAST generation | SH73 (east) | R | 9.9 | 0.1 | A | 7.4 | 0.2 | A |
| | Iris Taylor Avenue | L | 17.9 | 2.3 | C | 6.7 | 0.5 | A |
| | | R | 34.2 | 2.3 | D | 28.4 | 0.5 | D |
| 6. 2030 Test 5 with 100% direct access & widened approach. | SH73 (east) | R | 11.2 | 0.1 | B | 7.6 | 0.2 | A |
| | Iris Taylor Avenue | L | 22.4 | 1.9 | C | 7.0 | 0.2 | A |
| | | R | 37.0 | 0.3 | E | 32.8 | 0.3 | D |
| 7. 2030 Test 4, assuming 60 km/h environment. | SH73 (east) | R | 10.7 | 0.1 | B | 7.1 | 0.4 | A |
| | Iris Taylor Avenue | L | 38.3 | 4.2 | E | 7.6 | 0.6 | A |
| | | R | 65.5 | 4.2 | F | 37.1 | 0.6 | E |

**Table 8.2: Iris Taylor intersection performance (Year 2045)**

| Test | Movement | | Morning Peak Hour | | | Evening Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service |
| 8. 2045 No development added | SH73 (east) | R | 9.1 | 0.1 | A | 7.7 | 0.4 | A |
| | Iris Taylor Avenue | L | 13.9 | 1.8 | B | 7.2 | 0.5 | A |
| | | R | 28.0 | 1.8 | D | 25.5 | 0.5 | D |
| 9. 2045 No development added, using CAST generation | SH73 (east) | R | 9.4 | 0.1 | A | 7.1 | 0.4 | A |
| | Iris Taylor Avenue | L | 16.0 | 2.7 | C | 6.0 | 0.5 | A |
| | | R | 30.8 | 2.7 | D | 17.4 | 0.5 | C |
| 10. 2045 1234WCR development added ITA distribution 7.2.2 | SH73 (east) | R | 10.7 | 0.2 | B | 7.6 | 0.5 | A |
| | Iris Taylor Avenue | L | 69 | 12.5 | F | 7.0 | 0.7 | A |
| | | R | 94 | 12.5 | F | 41.8 | 0.7 | E |
| 11. 2045 Test 10 with widened approach | SH73 (east) | R | 10.8 | 0.2 | B | 7.7 | 0.5 | A |
| | Iris Taylor Avenue | L | 47.5 | 8.3 | E | 7 | 0.5 | A |
| | | R | 33.4 | 0.2 | D | 36.8 | 0.2 | E |
| 12. 2045 Test 10 with widened approach and CAST generation | SH73 (east) | R | 12.0 | 0.2 | B | 7.8 | 0.6 | A |
| | Iris Taylor Avenue | L | 180+ | 31 | F | 7.2 | 0.6 | C |
| | | R | 47.9 | 0.8 | E | 54.1 | 1.4 | F |
| 13. 2045 1234WCR 100% direct access to SH73* | SH73 (east) | R | 15.3 | 0.2 | C | 7.9 | 0.4 | A |
| | Iris Taylor Avenue | L | 600+ | 51 | F | 7.9 | 0.7 | A |
| | | R | 600+ | 51 | F | 68.5 | 0.7 | F |
| 14. 2045 1234WCR 65% direct access to SH73* | SH73 (east) | R | 12.2 | 0.2 | B | | | |
| | Iris Taylor Avenue | L | 70 | 7.1 | F | | | |
| | | R | 100+ | 7.1 | F | | | |
| 15. 2045 1234WCR 65% direct access to SH73*, CAST generation | SH73 (east) | R | 11.9 | 0.2 | C | | | |
| | Iris Taylor Avenue | L | 290+ | 44 | F | | | |
| | | R | 300+ | 44 | F | | | |

**Table 8.3: Iris Taylor intersection performance (Year 2055)**

| Test | Movement | | Morning Peak Hour | | | Evening Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service |
| 16. 2055 No development added | SH73 (east) | R | 9.9 | 0.1 | A | 7.9 | 0.4 | A |
| | Iris Taylor Avenue | L | 18.6 | 2.4 | C | 7.7 | 0.5 | A |
| | | R | 39.1 | 2.4 | E | 33.2 | 0.5 | D |
| 17. 2055 No development added, using CAST generation | SH73 (east) | R | 10.2 | 0.1 | A | 7.4 | 0.4 | A |
| | Iris Taylor Avenue | L | 180+ | 44 | F | 9.4 | 2.1 | A |
| | | R | 200+ | 44 | F | 32.8 | 2.1 | D |
| 18. 2055 1234WCR development added ITA distribution 7.2.2 | SH73 (east) | R | 11.9 | 0.2 | B | 7.8 | 0.6 | A |
| | Iris Taylor Avenue | L | 300+ | 50 | F | 7.4 | 0.8 | A |
| | | R | 300+ | 50 | F | 55.4 | 0.8 | F |
| 19. 2055 1234WCR 65% direct access to SH73 | SH73 (east) | R | 14.0 | 0.2 | B | | | |
| | Iris Taylor Avenue | L | 300+ | 35 | F | | | |
| | | R | 300+ | 35 | F | | | |
| 20. 2055 1234WCR 40% direct access to SH73 | SH73 (east) | R | 12.1 | 0.1 | B | | | |
| | Iris Taylor Avenue | L | 63 | 6.4 | F | | | |
| | | R | 97 | 6.4 | F | | | |

## 8.3 IRIS TAYLOR CAPACITY CHECK

The Iris Taylor/SH73 Give Way tee-intersection has been tested with several traffic demand scenarios for years 2030 and 2045. In all cases the worst performing peak is the AM peak. The intersection modelling results can be summarised as follows:

**Test 2** - In 2030, the intersection operates at a good level of service if no 1234WCR development is present (worst movement is right-turn out LOS C in the AM peak).

**Test 3** - When the development is added (assuming the 1234WCR traffic generation volumes and distribution adopted in the ITA) the intersection still performs adequately, with the worst movement LOS D in the AM peak. Approximately similar results to the ITA are achieved.

**Test 4** - If the internal link roads between 1234WCR and the Preston subdivision are severed, so that all 1234WCR traffic is assumed to access direct to SH73 rather than via Iris Taylor, traffic demand on Iris Taylor increases. This is because although the internal volume turning to and from Iris Taylor is reduced, conversely there is increased opposing through-flow heading into the city originating from the 1234WCR access, including the overflow traffic normally accessing Halkett Road. Delays to the high-volume left turn out movement in the morning peak begin to exceed 1 minute and Level of Service is F. This can be considered close to its capacity. The PM peak performs adequately.

**Test 5** - The above tests assume a fixed turning flow pattern based on the 2016 turning count, and an assumption of how the 1234 WCR development generated traffic will distribute to the Iris Taylor intersection. This can be tested against the CAST model trip generation for 2030, combined with the 0.9 trips/ 1234WCR dwelling identified previously in this report. Similar results to test 3 are obtained and the intersection performs adequately. Thus in 2030 using the CAST model does not change the results much.

**Test 6** - The existing side road throat of Iris Taylor is narrow and cannot accommodate many (if any) exiting vehicles side-by-side at the limit line. There is potential for right-turners to interfere with the large volume of left turning traffic exiting towards the city. In this test the intersection is re-modelled with a modest length of throat widening to accommodate a 14m (2 car) right turn lane. This is applied to see if it improves capacity. Traffic demand tested includes the test 4 100% 1234 WCR traffic distribution combined with the test 5 CAST distribution. A small improvement for the movements turning out of Iris Taylor is achieved – the worst movement is still poor but adequate at LOS E.

**Test 7** – The intersection is within a 60 km/h speed limit section on SH73 but is within 150 m of a 60/100 speed limit. The 60 km/h restriction is relatively short, and speeds are assessed in SIDRA at a cruise of 70 km/h. Test 4 is repeated to check the effect of a threshold-controlled 60 km/h speed limit relocated further west so that traffic speed through the intersection is reduced to 60 km/h Imposing the lower speed at the site makes almost no difference to the model results.

**Test 8** - If no 1234WCR development is present, Iris Taylor intersection is still performing adequately in 2045, with the worst movement the low-volume right turn at LOS D and an average delay of 28 seconds. This assumes static trip generation.

**Test 9** - If test 8 is repeated using the slightly higher 2045 CAST trip generation, Iris Taylor intersection is still performing adequately in 2045. with the worst movement the low-volume right turn at LOS D and an average delay of 31 seconds.

**Test 10** – If 1234WCR development is added to test 8, the intersection is performing poorly in 2045 with the high-volume left turn LOS of F and a 94 second delay. This assumes static trip generation as per the 2016 turning count survey. By 2055 exiting delays exceed 5 minutes.

**Test 11** – Modelling test 10 with a widened throat eases exiting congestion. The large left-turn out movement delay is still high at 48 seconds.

**Test 12** – Modelling test 11 with the slightly higher CAST model 2045 Preston subdivision trip generation causes the intersection to perform poorly with large volume left turn out queueing delays more than 3 minutes.

**Test 13** – Modelling Iris Taylor in 2045 with 100% of 1234 WCR development flow directed towards SH73 creates a large volume of opposing flow preventing vehicles exiting. The intersection performs very poorly with delays of more than 5 minutes. Traffic exiting Preston is likely to divert to an alternative exit point to Weedons Ross or Halkett.

Modelling Iris Taylor in 2045 with 100% of development flow directed towards SH73 and including CAST trip generation has not been attempted – the flows would be higher and the results worse than test 13.

**Test 14** – If the new development is limited to 65%, with all of it accessing direct to 1234 WCR / SH73 intersection, then the large morning volume which opposes existing Iris Taylor traffic in 2045 is also reduced. The maximum delay for the left turn city bound movement is better but still poor (more than 1.5 minutes delay).

**Test 15** – If test 14 is repeated, but assuming CAST traffic generation and distribution within the existing Preston subdivision, then very poor performance can be expected (traffic exiting delays 5+ minutes).

**Test 16** – The existing intersection is still performing adequately in 2055 if current (2016 survey) peak hour trips remain static, and there is no development.

**Test 17** – The existing intersection is beginning to perform poorly in 2055 if current (2016 survey) peak hour trips rise as indicated by the CAST model, again with no development traffic.

**Test 18** – Iris Taylor performs very poorly in 2055 with delays exceeding 5 minutes if development traffic is added as per the ITA. Traffic exiting Preston is likely to divert to an alternative exit point to Weedons Ross or Halkett.

**Test 19** – If the new development is limited to 65%, with all of it accessing direct to 1234 WCR / SH73 intersection, then the morning volume which opposes existing Iris Taylor traffic also causes delays exceeding 5 minutes.

**Test 20** – If the new development is limited to 40%, with all of it accessing direct to 1234 WCR / SH73 intersection, then the morning volume which opposes existing Iris Taylor traffic is reduced. Iris Taylor is beginning to perform poorly at this level, with delays to exiting traffic of 1.5 minutes.

## 8.4 IRIS TAYLOR KEY SUMMARY

1. The AM peak period is not operating satisfactorily. The problem movements are the right-turn out movement (which tends to be very low volume) and the left turn out movement (which is a high-volume city-bound movement)
2. If no 1234 WCR development is present Iris Taylor/SH73 priority tee will perform adequately until at least 2045, regardless of the trip generation criteria adopted, but may begin to perform poorly prior to 2055 if internal Preston trip generation increases as described by the CAST model.
3. If the development traffic at 0.9 trips/dwelling is added and distribution is assumed to match the ITA, the intersection performs adequately at 2030 but is beginning to perform poorly in 2045, showing signs of high delay (1.5 minutes) for the morning peak high-volume left turn movement. By 2055 delays exceed 5 minutes.
4. But if the CAST model trip generation is adopted, the intersection is performing worse in 2045 in the morning with left-turn delays exceeding 3 minutes, even with some small widening improvements.
5. If 100% of 1234WCR development traffic is directed towards SH73 via the proposed 1234WCR intersection, the extra opposing eastbound traffic on SH73 makes it difficult for traffic to exit Iris Taylor in the morning peak at some point soon after 2030. By 2045 exiting delays are extremely high.
6. If 1234WCR development traffic is limited to 65% of full capacity, and all of it directed towards SH73 via the proposed 1234WCR intersection, then the opposing morning flow generated at Iris Taylor begins to notably restrict Iris Taylor traffic exiting. Left turn out delay is about 1.5 minutes in 2045. By 2055 this delay exceeds 5 minutes.
7. If 1234WCR development traffic is limited to 40% of full capacity, and all of it directed towards SH73 via the proposed 1234WCR intersection in 2055, then the opposing morning flow generated at Iris Taylor begins to notably restrict Iris Taylor traffic exiting. Left turn out delay is about 1.5 minutes.
8. If CAST development traffic generation is assumed, then the flow in and out of Iris Taylor is higher than the static trip generation assumed in the ITA. By 2055 Iris Taylor is struggling to accommodate that flow, even with no new 1234WCR development in place. So, if CAST development traffic generation is assumed within the Preston subdivision, then there is no available capacity at Iris Taylor (in its current form) at 2055 to accommodate any new development at all.
9. A SH73 speed reduction from modelled 70 km/h to modelled 60 km/h makes little difference.
10. The modelling is sensitive to assumptions made about SH73 through-flow and internal trip generation. Generally, the ITA adopts an optimistic lower trip generation profile with a distribution that tends to lower the impact on Iris Taylor intersection.
11. The Preston subdivision has multiple access points to SH73, Weedons Ross, and Halkett roads. The above modelling (using SIDRA Intersection) does not take account of the tendency for traffic to re-distribute to other access points as delays at Iris Taylor become higher, where there is perceived to be a quicker alternative route.

# 9 1234WCR/SH73 INTERSECTION MODEL & SIDRA

## 9.1 TRAFFIC MODEL USING CAST

An AM and PM traffic model has been developed for the proposed 1234WCR/SH73 intersection, incorporating the following:

- Traffic volumes as predicted in the ITA for 2030, generated at 0.9 trips/dwelling;
- Tested at 1.4 trips/dwelling/hr in 2045
- Tested at year 2045 and 2055
- Tested with 100% of development traffic accessing SH73 directly
- Tested using a 2045 CAST distribution

The modelled intersection layout is assumed to be identical to the existing Iris Taylor Give-way tee format, except that the throat is widened slightly to ensure 2 vehicles (1 turning to the east and 1 turning towards the west) can exit side by side.

CAST SH73 traffic volumes have not been tested as they are generally lower than the values predicted by the traffic counters.

Note that the ITA does not model this intersection. It (correctly) identifies the existing neighbouring Iris Taylor intersection as more vulnerable due to its higher traffic load. The implication in the ITA is that if Iris Taylor can function adequately with the extra traffic load imposed by the development, then an identical format intersection at 1234 WCR with less traffic load will also work fine. Any reference to the ITA in the tests is referring to a traffic characteristic that has been copied from the ITA Iris Taylor analysis.

The modelling does not include modelling within CAST i.e., inserting the proposed network into CAST and then running CAST to see how the new development will distribute. Only the existing CAST network output is used. CAST outputs are examined to see how the existing Preston subdivision is treated, and then similar assumptions made for the proposed 1234WCR development.

Model results are listed below in a similar manner to the ITA to aid comparison. Only opposed movements are reported. Movements beginning to perform poorly (LOS D to E) are highlighted **orange** and very poorly (LOS F) highlighted **red**:

**Table 9.1: 1234WCR intersection performance (Year 2030)**

| Test | Movement | | Morning Peak Hour | | | Evening Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service |
| 1. 2030 1234WCR development ITA 5.1.11 | SH73 (east) | R | 9.5 | 0.1 | A | 7.7 | 0.2 | A |
| | 1234WCR | L | 11.6 | 1.1 | B | 6.0 | 0.2 | A |
| | | R | 19.7 | 0.1 | C | 21.5 | 0.1 | C |
| 2. 2030 1234WCR development CAST Distribution | SH73 (east) | R | 9.6 | 0.2 | A | 7.8 | 0.4 | A |
| | 1234WCR | L | 13.2 | 2.1 | B | 6.1 | 0.4 | A |
| | | R | 20.6 | 0.3 | C | 24.1 | 0.3 | C |
| 3. 2030 1234WCR development 100% direct access to SH73 | SH73 (east) | R | 9.6 | 0.2 | A | 7.8 | 0.7 | A |
| | 1234WCR | L | 20.4 | 6.0 | C | 6.0 | 0.6 | A |
| | | R | 20.7 | 0.2 | C | 26.6 | 0.3 | D |

**Table 9.2: 1234WCR intersection performance (Year 2045)**

| Test | Movement | | Morning Peak Hour | | | Evening Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service |
| 4. 2045 1234WCR development ITA 5.1.11 | SH73 (east) | R | 11.0 | 0.1 | A | 7.9 | 0.2 | A |
| | 1234WCR | L | 18.0 | 1.1 | B | 6.5 | 0.2 | A |
| | | R | 32.0 | 0.1 | C | 35.6 | 0.1 | E |
| 5. 2045 1234WCR development @1.4 CAST Distribution | SH73 (east) | R | 11.3 | 0.3 | B | 8.0 | 0.4 | A |
| | 1234WCR | L | 140+ | 33 | F | 6.6 | 0.4 | A |
| | | R | 37.9 | 0.7 | E | 46.5 | 0.9 | E |
| 6. 2045 1234WCR development 100% direct access to SH73 | SH73 (east) | R | 11.2 | 0.3 | B | 8.2 | 0.8 | A |
| | 1234WCR | L | 200+ | 62 | F | 6.7 | 0.6 | A |
| | | R | 200+ | 62 | F | 49.6 | 0.5 | E |
| 7. 2045 1234WCR development with extended throat 90% direct access to SH73 | SH73 (east) | R | 11.2 | 0.3 | B | 8.2 | 0.7 | A |
| | 1234WCR | L | 116.5 | 26.6 | F | 6.6 | 0.6 | A |
| | | R | 33.8 | 0.4 | D | 46.6 | 0.5 | E |
| 8. 2045 1234WCR development with extended throat 90% direct access to SH73, 60 km/h limit | SH73 (east) | R | 9.8 | 0.3 | B | 8.2 | 0.7 | A |
| | 1234WCR | L | 116.5 | 26.6 | F | 6.6 | 0.6 | A |
| | | R | 33.8 | 0.4 | D | 46.6 | 0.5 | E |
| 9. 2045 1234WCR development @1.4 with extended throat 58% direct access to SH73 | SH73 (east) | R | 11.2 | 0.3 | B | 8.2 | 0.7 | A |
| | Iris Taylor Avenue | L | 110+ | 26.6 | F | 6.6 | 0.6 | A |
| | | R | 110+ | 0.4 | F | 46.6 | 0.5 | E |
| 10. 2045 1234WCR development @1.4 with extended throat 100% direct access to SH73 | SH73 (east) | R | | | | 8.7 | 1.8 | A |
| | Iris Taylor Avenue | L | | | | 6.8 | 1.0 | A |
| | | R | | | | 75.4 | 1.1 | F |

**Table 9.3: 1234WCR intersection performance (Year 2055)**

| Test | Movement | | Morning Peak Hour | | | Evening Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service | Avg Delay (secs) | 95%ile Queue (veh) | Level of Service |
| 11. 2055 1234WCR development with extended throat ITA 5.1.11 | SH73 (east) | R | 12.2 | 0.1 | B | 8.1 | 0.3 | A |
| | 1234WCR | L | 26.2 | 2.3 | D | 6.8 | 0.2 | A |
| | | R | 44.2 | 0.2 | E | 49.6 | 0.2 | E |
| 12. 2055 development with extended throat 65% direct access to SH73 | SH73 (east) | R | 12.3 | 0.2 | B | 8.2 | 0.5 | A |
| | 1234WCR | L | 110+ | 17.5 | F | 6.9 | 0.4 | A |
| | | R | 45.7 | 0.3 | E | 57.7 | 0.4 | F |

## 9.2 PROPOSED 1234WCR GIVEWAY TEE CAPACITY CHECK

The proposed 1234WCR/SH73 Give Way tee-intersection with right turn bay has been tested with several traffic demand scenarios for years 2030, 2045, and 2055. The intersection layout matches the existing Iris Taylor except it has a slightly widened throat to allow vehicles to exit side by side. Where the test indicates an extended throat, the width is extended so that side by side queueing up to 20m log is available.

In all cases the worst performing peak is the AM peak. The intersection modelling results can be summarised as follows:

**Test 1** - In 2030, the intersection operates at a good level of service (worst movement is right turn out LOS C in the AM peak).

**Test 2** - In 2030, the intersection still operates well if CAST distribution is applied.

**Test 3** - If the internal link roads between 1234WCR and the Preston subdivision are severed then all 1234WCR traffic (100%) is assumed to access direct to SH73 rather than via Iris Taylor. The intersection still operates in 2030 at an adequate level of service (worst movement is right turn out LOS C in the PM peak).

**Test 4** - In 2045, the intersection operates at an adequate level of service if trip generation remains at 0.9 trips/dwelling/peak hr (worst movement is right turn out LOS E in the PM peak).

**Test 5** - In 2045, the intersection still operates adequately if CAST distribution is applied, although the small right-turn out movement experiences moderately high delays.

**Test 6** – If test 4 is repeated with 100% of traffic directed to SH73, the intersection performs poorly with delays exceeding 3 minutes in the 2045 morning peak.

**Test 7** – If test 4 is repeated with 90% of traffic directed to SH73, the intersection is at the reaching the end of its serviceable life with delays exceeding 110 seconds in the 2045 morning peak. This can be considered the limit of new subdivision traffic generation the intersection can cope with in 2045 and equates to about 425 trips total/hr.

**Test 8** – If test 7 is repeated with SH73 strictly limited to 60 km/h, very little change in delay occurs.

**Test 9** – If test 7 is repeated using 1.4 trips/dwelling/peak hr, as is predicted by CAST for the adjacent Preston subdivision in 2045, then the maximum proportion of subdivision traffic generation that the intersection can handle is about 60%.

**Test 10** – Test 10 is a PM only test using 1.4 trips/dwelling/peak hr generation, 100% directed to SH73. The intersection works, but delays exceed 1 minute for the right turn out movement. The AM peak is not tested as it has already been shown to perform very poorly in test 9.

**Test 11** – If test 1 is repeated for 2055 the intersection performs adequately although left turn out delays are starting to get moderately high.

**Test 12** – If the internal link roads between 1234WCR and the Preston subdivision are severed and all 1234WCR traffic is assumed to access direct to SH73, then the proportion of subdivision that can exit in 2055 before delays become high is around 60%, which equates to a generation of about 300 trips/hr. Average worst movement AM delays are about 2 minutes. This assumes static 0.9veh/dwelling generation.

## 9.3 1234 WCR KEY SUMMARY

1. The most sensitive peak period is AM. More specifically, the most sensitive movements are the right turn out movement (which tends to be very low volume) and the left turn out movement (which is a high-volume city-bound movement)
2. The intersection works adequately in both 2030 and 2045 regardless of the trip generation adopted, assuming traffic links are available to Preston subdivision and Halkett Road.
3. If 100% the development traffic is directed solely to SH73, the intersection still operates well in 2030 but is performing poorly in the 2045 AM peak with delays exceeding 3 minutes. The practical limit of the intersection in the morning peak is about 90% of subdivision generated traffic in 2045 (assumes the side road throat is extended slightly). By 2055 a LOS F is experienced in the morning at 65% proportion of the subdivision development – about 300 trip/hr. This assumed constant trip generation of 0.9 trips/dwelling/peak hr.
4. If trip generation within the subdivision is raised from 0.9 to 1.4, then the practical limit for the proportion of the development that can access the intersection in the morning peak is about 60% in 2045.
5. A SH73 speed reduction from a modelled 100-70 km/h environment to a modelled 60 km/h makes little difference to delays.
6. The modelling is sensitive to assumptions made about SH73 through-flow and internal trip generation.
7. Under the scenario where all the development is directed to SH73, at some point the new intersection will begin to experience higher delays. Adopting a 2-minute delay as a representative peak hour delay threshold for the worst movement and a 65% proportion of the original 525 dwellings completed, then the intersection will reach these higher delays between 2045 (assuming 1.4 trips/dwelling) and 2055 (assuming 0.9 trips/dwelling).
8. Future capacity of the intersection is expected to be limited in its current proposed right-turn-bay priority Tee form, due to the opposing volume of SH73 through-flow in the morning. An alternative form of intersection should be considered if 100% of development traffic needs to be accommodated by the one access point onto SH73. This alternative will have impacts on SH73 through movements and may also have a quite different impact on Iris Taylor intersection.

# 10 SUMMARY

A summary of our assessment findings based on the client's brief follows:

**Table 10.1: Summary Table**

| Brief items by Marama Te Wai Ltd. | Findings |
|---|---|
| *Review of existing TIA prepared for PCR77 and confirm or otherwise that the likely form of intersection (similar to Iris Taylor Ave) is appropriate and traffic generation and movements are reasonable assumptions. Assume the intersection is located centrally along the site frontage.* | The form of intersection proposed for 1234WCR (copy of the existing Iris Taylor) is appropriate in the short to medium term, using traffic level of service and peak hour movement delays as defining performance measures.<br><br>Replicating the TIA 2020 and 2030 models yield approximately the same delay and LOS results<br>There are several assumptions which influence Level of Service at the intersection, such as trip generation and growth on SH73.<br>The intersection still operates at an adequate level of service at 2055 if trip generation remains a moderate 0.9trips/dwelling/hr but experiences high right-turn out delays by 2045 if trip generation is the higher extreme of 1.4. |
| *Modelling of the intersection to determine performance based on the whole PCR 77 area traffic coming through here; and if required, determining what volume of traffic would get an acceptable level of service.* | If other proposed connections within the proposed subdivision are severed so that the only access is to 1234 West Coast Road:<br>If 100% of the development traffic is directed solely to SH73, the intersection still operates well in 2030 but is performing poorly in the 2045 AM peak with delays exceeding 3 minutes.<br>Poor level of service (F) begins to occur in the following scenario morning peaks where the new subdivision is restricted in size:<br>2045 - 90% (equates to about 425 trips/peak hour, assuming 0.9 trips generation)<br>2045 – 60% (equates to about 425 trips/peak hour, assuming 1.4 trips generation)<br>2055 - about 65% (about 300 trips/hr at a generation rate of 0.9 trips/dwelling) |
| *Advise on whether there will be impacts due nearby intersections (Iris Taylor Ave) and what the proposed signals at Weedons Ross Road might have on the development and the performance of this intersection (I expect these are too far away to have an influence).* | **Iris Taylor/SH73:**<br>As a base-line check, with no new development, the existing Iris Taylor intersection operates adequately beyond 2050 (but if trip generation grows as high as indicated by CAST, then Iris Taylor will experience LOS F movements between 2045 and 2055).<br><br>For the fully-connected scenario as assessed in the ITA, where new subdivision traffic travels via both 1234WCR and Iris Taylor, then LOS F is experienced by 2045 during the morning peak. LOS F will be reached earlier if the Preston subdivision generates increased trips as indicated by CAST. The intersection is impacted by both the extra internal traffic, and the extra southbound traffic originating from 1234WCR.<br><br>For the severed connection scenario, Iris Taylor is impacted by the large volume of AM traffic exiting the solitary 1234WCR access. **LOS F occurs for Iris Taylor left turn out movement in the morning peak soon after full development is reached in 2030** (this assumes 100% of the development utilising 1234WCR access). |

| Brief items by Marama Te Wai Ltd. | Findings |
|---|---|
| | For the severed connection scenario, the size of the development can be limited to reduce the volume of disrupting traffic. LOS F occurs for Iris Taylor left turn out movement morning peak when the subdivision is restricted in size as follows:<br>• 2045 – 65% (equates to about 300 trips/peak hour, assuming 0.9 trips generation)<br>• 2055 - 40% (about 190 trips/hr at a generation rate of 0.9 trips/dwelling<br>• 2055 - 0% (intersection is at capacity if CAST generation occurs in the Preston subdivision).<br><br>This modelling does not take into account the potential for Preston subdivision traffic to redistribute to other access points to and from the subdivision as delays and queues at Iris Taylor intersection increase.<br><br>The above findings assume free flow conditions on SH73. The proposed Weedons Ross signals could further disrupt traffic movements at Iris Taylor and reduce its future capacity below that described above.<br><br>**Weedons Ross/SH73 signals**:<br>*To be confirmed, dependant on data availability of proposed signals* |
| *The frontage is currently 100 km/h but would like to see results for 60 km/h as well, as the current 60 km/h could be extended following installation of the signals.* | No significant effect on delays or level of service is apparent for either 1234WCR or Iris Taylor models if the local SH73 speed environment is reduced from 100 km/h to 60 km/h. |

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# APPENDIX C | STANTEC RFI RESPONSE

Ref: PC200077

22 October 2021

Selwyn District Council
PO Box 90,
Rolleston 7643

**Attention:** **Nick Boyes**
Consultant Planner

Dear Sir/Madam,

**PC200077: Private Plan Change Request from Marama Te Wai Limited to the Operative Selwyn District Plan at West Melton (West): Request for further information**

The request for further information dated 27 April 2021 refers.

We (Stantec) are acting on behalf of the applicant. Our current engagement to date is / has been limited to transport matters and in particular the connection to/from SH73 and associated effects. To this end our response are focussed on items 5, 9 -12 from a transport perspective, as summarised in the following table:

| Item | Description |
|---|---|
| **5** | **Please provide details of any consultation undertaken with Waka Kotahi/NZTA regarding the proposed new intersection onto State Highway 73** |
| | Consultation with Waka Kotahi has commenced and is ongoing (NZTA Ref. 15005). To this end a consultation meeting was held with representatives from their Environmental Planning Department on Wednesday, 20 October 2021.<br><br>Attendance: For Waka Kotahi: Richard Shaw, Team Lead South – Environmental Planning; and James Long, Road Safety; For Stantec: Andrew Leckie, Nick Overdevest and Tobie Ueckermann.<br><br>Key discussion points:<br><br>- Richard Shaw indicated that Waka Kotahi is a member of the Greater Christchurch Partnership (GCP). The application will be considered in terms of the GCP planning strategies / policies from a strategic perspective and the likely consequences of further growth in West Melton and may involve discussions with the other GCP parties including Selwyn District Council.<br><br>- James Long indicated that a conventional T-intersection is not considered an acceptable safe system solution in a 100-km/h posted speed limit environment. Waka Kotahi did not indicate what form of intersection would be acceptable but agreed that 'proportionality' would be considered in agreeing to a particular form of intersection (i.e., level of traffic movements to be generated by the intersection).<br><br>- Regarding possible changes to the posted speed limit that may be required, James Long indicated that the previous speed limit review along SH73 in West Melton took 18-months to complete. He mentioned that it is not an agile process and requires legal review, extensive public consultation to proceed before it can be implemented.<br><br>- The planned signalisation of Weedon Ross Road has not accounted for plan area growth (i.e., PC77 and others).<br><br>- Waka Kotahi will review the application and circulated to different internal teams for review including Environmental Planning, Network Management and Transport Planning.<br><br>- The Integrated Transport Assessment (Carriageway Consulting) and Road Network Connectivity |

| | |
|---|---|
| | Assessment (Stantec) will be reviewed by an external consultant, possibly Flow Consultants (as Waka Kotahi do not have the internal traffic modelling capacity). This review will inform their feedback on the proposed access and associated network impacts.<br>- The review process will likely take at least 3-4 weeks to be finalised after which we will be provided with formal comments on the application.<br><br>From a design perspective it is noted that proposed intersection access point:<br>• Is located approximately 585 metres from the Iris Taylor Avenue intersection and approx. 900 metres from the Weedon Ross intersection and considered appropriate from an access spacing perspective in a suburban context (i.e., considering West Melton as an urban area);<br>• Spacing to adjacent accessways are also generally in-line with the standard accessway spacing requirement of 200 metres, being:<br>o 176-metres to the west (same side) but this rural accessway will be 'stopped' as part of the proposals associated with PC77.<br>o 204 metres to the east (opposite side) and therefore exceeds the requirement.<br>• The 20-metre reserve of SH73 can accommodate a conventional T-intersection and/or other form of intersection with localised intersection reserve widening; along with any supporting active transport infrastructure that may be required.<br>• Complies with safe intersection and general sight distance requirements (see **Diagram 1** below).<br><br>  <br>***Diagram 1: Intersection sight distances and accessway spacings along SH73*** |
| **9** | **Please advise of any discussions with the owners of these adjoining properties (as well as Council and the Department of Conservation) regarding the feasibility of the proposed roading connections between the area of the plan change and the existing township proceeding as shown on the ODP.** |
| | We understand that consultation with landowners of the properties affected by the proposed east-west connections have progressed.<br><br>Lot 283 DP 458646 (44 Shepherd Avenue), the 'site' of the proposed 'central' east-west connection has been purchased by the applicant and there is therefore an ability to provide this east-west connection to Shepherd Avenue / Elizabeth Allen Drive (see **Diagram 3** below). |
| **10** | **Please provide some commentary on the ability of the plan change to proceed in the absence of the ability to secure one or any of the proposed connections. Furthermore, please advise of the** |

| | |
|---|---|
| | **proposed mechanisms included within the amendments to the operative District Plan to ensure that residential development could not proceed until such time as these connections are available.** |
| | From a practical perspective, the development can proceed without securing any of the proposed 'internal' east-west connections on the eastern side. This will however channel an increased level of traffic to/from SH73 and Halkett Road intersections and hence require these access intersections to be engineered to accommodate an increased level of traffic and associated increased level of operational / safety effects along the external roads. This may require a different form of intersection along SH73 (i.e., other than for a conventional T-intersection). A conventional T-junction type intersection should still suffice along Halkett Road.<br><br>For evaluation purposes, a trip generation scenario has been considered without any east-west connections (i.e., all development traffic channelled via the proposed north-south collector road only and hence to/from the SH73 and Halkett Road intersections only). The calculation illustrates that the development can eb fully accommodated via the north-south road only but will require the intersections with SH73 and Halkett Road to be engineering to suit and any external impacts mitigated as necessary.<br><br>It is however noted that Lot 283 DP 458646 (44 Shepherd Avenue) has been purchased by the applicant and therefore there is an ability for an east-west connection to Shepherd Avenue / Elizabeth Allen Drive. This along with any additional east-west connections (refer concept layout plans showing indicative layouts) could offset the traffic loading along SH73 and Halkett Road and reduce the extent of any external roadway mitigation measures or improvements that may be required to support the application. |
| **11** | **Please provide sufficient engineering detail to show how the proposed connection and re-alignment could be accommodated within the existing land available without impacting on other adjoining private landholdings.** |
| | The proposed 'northern' east-west connection goes through the existing recreational reserve on Lot 411 DP 453222. This connection can be provided pending the necessary approvals by Council and the Department of Conservation. A concept layout for the 'northern' connection is illustrated as show in **Diagram 2** below. As shown the proposal will not directly impact on adjoining private landholdings.<br><br>  <br><br>***Diagram 2: Concept layout for the 'northern' east-west connection***<br><br>Lot 283 DP 458646 (44 Shepherd Avenue), the 'site' of the proposed 'central' east-west connection has been purchased by the applicant and there is therefore an ability to provide this east-west connection to Shepherd Avenue / Elizabeth Allen Drive (see **Diagram 3** below). As shown the proposal will not directly impact on adjoining private landholdings (i.e., other than on the site itself). |

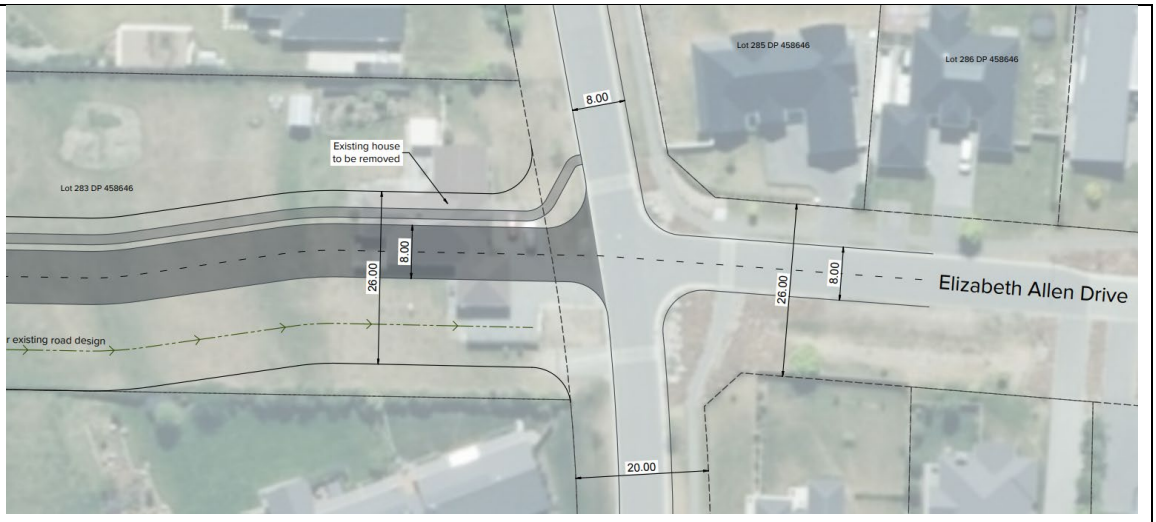



***Diagram 3: Concept layout for the 'central' east-west connection***

Lot 356 DP 469289 (60 Shepherd Avenue), the 'site' of the proposed 'southern' east-west connection is yet to be purchased by the applicant. The connection intends to provide an east-west connection to Shepherd Avenue / Winnfield Drive and may affect the existing house on the site (see **Diagram 4** below). As shown the proposal will not directly impact on adjoining private landholdings (i.e., other than on the site itself).


***Diagram 4: Concept layout for the 'southern' east-west connection***

| | |
|---|---|
| **12** | **Please provide further detail as to the proposed pedestrian and cycle linkages through to West Melton township, in particular the School and existing amenities.** |
| | Any or all of the proposed roading connections on the eastern side will connect with Shepherd Avenue and therefore the established walking infrastructure in West Melton thus enabling connectivity to other destinations in the West Melton area, including the town centre and the West Melton School. The movements would eb facilitate via the existing active transport connections via Prestons Avenue, Laird |

| | |
|---|---|
| | Place/Westview Crescent and Corriedale Lane.<br><br>At a minimum at least a couple of east-west connections, even if just for active transport users (e.g., through the northern reserve, which is already possible) should be established by means of footpaths / shared paths (and any associated easements that may be required) to improve active transport accessibility / connectivity.<br><br>The Carriageway ITA included the following external walking and cycling proposals / possibilities:<br><br>8.2.2. In practice it is anticipated that the existing footpath on State Highway 73 will be extended westwards to the proposed new intersection serving the site, but this can be achieved within the legal reserve.<br><br>8.2.3. The NZTA Cycle Network and Route Planning Guide indicates various combinations of traffic flows and speeds for when specific cycling infrastructure is required. Based on these, cycle lanes or sealed shoulders are already required on State Highway 73, but in practice the presence of parked cars leads to only an intermittent level of provision. As set out above however, measures are proposed in future to provide for cycling. No internal cycling infrastructure is required due to the lower speed, lightly-trafficked nature of the roads.<br><br>8.2.4. That said, it is anticipated that the roads within the site will meet the Council's standards for new roads, including the provisions of footpaths and cycling infrastructure where necessary, and therefore no further comment has been made on the internal road network.<br><br>Notes:<br><br>a) The extension of the existing footpath on the southern side of SH73 could be problematic due to the presence stormwater drains. A shared path facility on the northern side may be more feasible but will require physical segregation from the roadway using steel barriers or similar due to high vehicular speeds. It is noted that SH73 doesn't have wide sealed shoulders which may complicate the provision of walking/cycling facilities.<br><br>b) The highlighted statement in point 8.2.3. above is not defined in the ITA report (i.e., other than for the internal road proposals as per 8.2.4). |

Please contact the writer should you have any questions and/or require further details.

Yours sincerely

Tobie Ueckermann *CMEngNZ, CEng*
**Principal Transportation Engineer - Transportation Advisory, Private Sector**
**Stantec New Zealand**

Encl.: Annexure A :Trip generation summary: North-south collector road only

Copy to: Marama Te Wai Limited; Inovo Projects

## Annexure A: Trip generation summary: North-south collector road only

**Estimate of Development Trip Generation**

Estimate with north-south collector road only (i.e., without any east-west connections). This scenario thus focussed on connections with SH73 (south) and Halkett Road (north) only, for evaluation purposes.

| | | |
|---|---|---|
| Area | 50 | ha |
| Density | 15 | du/ha |
| HH | 750 | units |
| Trips | 1.4 | per HH (AM/PM Peak Hour) |

**AM/PM Peak Trips**

| | | | AM | | | | | PM | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Split | | Trips | | | Split | | Trips | | |
| | | | In% | Out% | In | Out | Total | In% | Out% | In | Out | Total |
| **Overall** | 100% | **1050** | 0.25 | 0.75 | 263 | 788 | 1,050 | 0.65 | 0.35 | 683 | 368 | 1,050 |
| **North** | 25% | **263** | 0.25 | 0.75 | 66 | 197 | 263 | 0.65 | 0.35 | 171 | 92 | 263 |
| **South** | 75% | **788** | 0.25 | 0.75 | 197 | 591 | 788 | 0.65 | 0.35 | 512 | 276 | 788 |
| | | **1050** | | | 263 | 788 | 1,050 | | | 683 | 368 | 1,050 |

Notes on trip generation:

1. The trip generation rate used is conservative (and associated with rural single-unit residential dwellings);
2. The trip distribution north (to/from Halkett Road) and south (to/from SH73) is based on the site layout and location in relation the surrounding road network;
3. The in/out trip distributions are based on ITE Trip Generation Manual 9th Edition and compares generally well with the earlier ITA (especially during the PM Peak Hour).
4. The proposed north-south collector road can easily accommodate the expected level of traffic:- estimated to be in the order of 788-vph on the southern end and 263-vph on the northern end of the road;
5. Most traffic would be directed to/from the east from either the SH73 or Halkett Road intersections;
6. The SH73 intersection will require an alternative form of intersection and traffic control to manage the increased level of traffic;
7. The Halkett Road intersection should work efficiently as a priority-controlled T-intersection with auxiliary turning lanes as necessary.
8. There will likely be an increased need to mitigate external, downstream effects along SH73, in particular at the Iris Taylor and Weedon Ross intersections which could involve road capacity improvements/ upgrades. This will need to be assessed in detail in the subdivision Integrated Transportation Assessment in due course and using the CAST traffic model (or similar);
9. Any 'internal' east-west connections could 'dilute' the impact on the external road network and reduce the external roadway impacts and hence the extent of any external improvements (i.e., other than at the access points off SH73 and Halkett Road) that may be required.

# APPENDIX D | URBAN DESIGNER RFI RESPONSE

# PC 77 - RFI reply Urban Design Matters

6
*Please provide an updated ODP addressing the various matters below and also include explanatory text addressing matters such as density, access and transport, open space, recreation and community facilities, servicing and reverse sensitivity.*

A ODP narrative has been added to cover the following matters
- Density distribution and amenity,
- movement network and connectivity,
- green network and open space,
- interfaces and edge treatment,
- servicing and other technical matters

8.
*Please update the ODP/accompanying explanatory text to include the overall density target and also to at least describe the areas where any Medium Density Residential Development is proposed.*

Please refer to RFI letter.

*The ODP shows the secondary connections with the existing West Melton Township to the east. Furthermore, all the urban design and traffic assessments undertaken in relation to the plan change appear to be contingent on these connections going ahead. The northern connection (Preston Avenue) is through an existing Council Reserve vested for recreation purposes (see Figure 1 below). The ability to utilise this reserve for roading purposes is dependent on the outcome of a Reserves Act process. Council's Asset Manager also advises that the likely re-alignment required might also impact on other adjoining properties. Furthermore, the other connections (aligning with Elizabeth Allen Ave, and Wilfield Ave) are currently blocked by private properties and houses. This raises matters of feasibility of achieving the proposed connections.*

10.
*Please provide some commentary on the ability of the plan change to proceed in the absence of the ability to secure one or any of the proposed connections. Furthermore, please advise of the proposed mechanisms included within the amendments to the operative District Plan to ensure that residential development could not proceed until such time as these connections are available.*

Connectivity is a critical part for residential development and particular in West Melton where north-south connectivity across SH73 is limited and east west connectivity through between existing developments is often difficult to achieve due to older development 'shutting the door to urban extension.

The Applicant owns the property opposite Elisabeth Allen Avenue (44 Shepherd Avenue). The ODP is therefore able to secure one vehicular connection along the eastern boundary opposite Elisabeth Allen Avenue. This is the most important connection to achieve connectivity between the proposed development and the existing town.

It is in central location connecting the key open space within the Plan Change Site with the eastern neighbourhood and further on to the towncentre via either Shepherd Avenue (the southern route) or Elizabeth Allen Avenue the central route.

In the absence of a second vehicular connection, additional pedestrian and cycle connections can be achieved at the northern reserve at Preston Avenue (the northern route to provide a finer grain pedestrian and cycle network.

Refer to 12 – connectivity overlay

However, the proposed central link does create good connectivity to the eastern neighbourhood and can accommodate several modes of transport with a focus on cycling and pedestrian priority via a shared pedestrian/cycle path.

In addition, SH 73 will be a key connection to the towncentre and other destinations in West Melton such as the local domain, church, tavern and community centre located to the south of SH73.

The ODP does not show any main walking and cycling networks. It is noted that Section 8.2.2 of the Carriageway Traffic Assessment refers to extending an existing footpath west along SH73 to the new intersection. The Council's Asset Roading Manager advises that there is no existing footpath on the development side of the road west of Weedons Ross Rd. It would have been preferable to have further walk/cycle links to Shepherd Drive as the development is elongated, but like the ODP roading links this would be required through existing private property.

12.
*Please provide further detail as to the proposed pedestrian and cycle linkages through to West Melton township, in particular the School and existing amenities*

Refer to connectivity diagram attached

13.
*Please clarify what the green dot shown on the ODP represents*

The green dot is meant to be a green link to extend from the central green space to the western boundary to create a future high amenity corridor and provide a break in the built environment.

16.
*Please provide an assessment of the building heights and densities proposed in the request relative to Policies 3(d) and 1(a). This assessment should demonstrate, in terms of the proposed densities, what the differences are on the ground between 12 and 15hh/ha and how the proposal provides for a variety of homes that meet the needs of different households, including all age groups.*

The ODP has been designed to accommodate several medium density housing locations, which will provide a greater mix of house types and price points, and enable the minimum density of 12hh/ha to be met. This will be achieved through enabling different housing typologies (i.e. duplexes, multi units/level complexes), which will be better suited to differing age groups (as opposed to single standalone units) providing for greater variety in households and age groups.

The proposed LZ development will broaden the range of housing options available and will in particular include more opportunity to 'age in place' due to the provision of smaller sites. As, the site is within easy and convenient walking/cycling distance to the existing West Melton shops and the school; on the north side of the West Coast Road; and to the community centre, preschools, Domain and West Melton Tavern, it is considered that the Site is well suited to enabling MD areas. Further, the Site layout can be designed to support future public transport in the fullness of time.

Building heights will be guided by zoning rules which generally allow for 2 storey dwellings. The minimum 12hh/ha requirement will not alter this. To achieve an achieve an overall density of 15 hh/ha a height increase of 1 storey may be required in MD areas – however, the comprehensive MD design process and associated rules already enable this as designs are assessed via a resource consent based on in context and on 'design merit'.

17.
*The Council's Urban Designer considers the proposal is missing an assessment of the western boundary in the context of what will be a rural-urban interface. Such an assessment is required and needs to extend to a discussion of the current land uses and potential reverse sensitivity issues, as well as discuss any mitigation measures proposed*.

The western boundary to the rural environment will shift westwards. The interface with the rural environment does not require specific mitigation measures as the rural farming activities and the residential activities are fairly compatible. LZ zone allows for a variety of lot sizes and it is proposed to place slightly larger lots along this internal boundary to the rural environment. This allows for a larger setback for dwellings and space for planting on private property so individual owners can create their own landscaped boundary treatment to achieve privacy and shelter if desired.

To achieve a cohesive and rural appearance consistent open style rural fencing is proposed along the rural boundary. In combination with the individual landscape treatment this will create a cohesive appearance with a good level of variety in landscape treatment
In addition, the western boundary is visually broken into 4 segments by proposed future linkages creating gaps in the built environment. These linkages have been added to futureproof the development and be able to provide connectivity should urban growth extend further west over time. These future links also allow viewshafts from the development into the rural environment to the west enhancing the internal amenity for residents.

18
*The application also needs to include a character assessment of the site, including visual impact (e.g., loss of outlook) on existing residential sections in West Melton (Shepherd Avenue).*

The urban design report included a description of the site and general site characteristic.
A full assessment of the character of the site and the receiving environment as well as a visual impact assessment with a focus on residents are currently being prepared.

19
*Discussion on SH73 interface and more specifically how the proposed response will create a more urban streetscape/entry into the town. The proposed layout is designed to create buffer for immediate relief from SH73 rather than an integrated solution.*

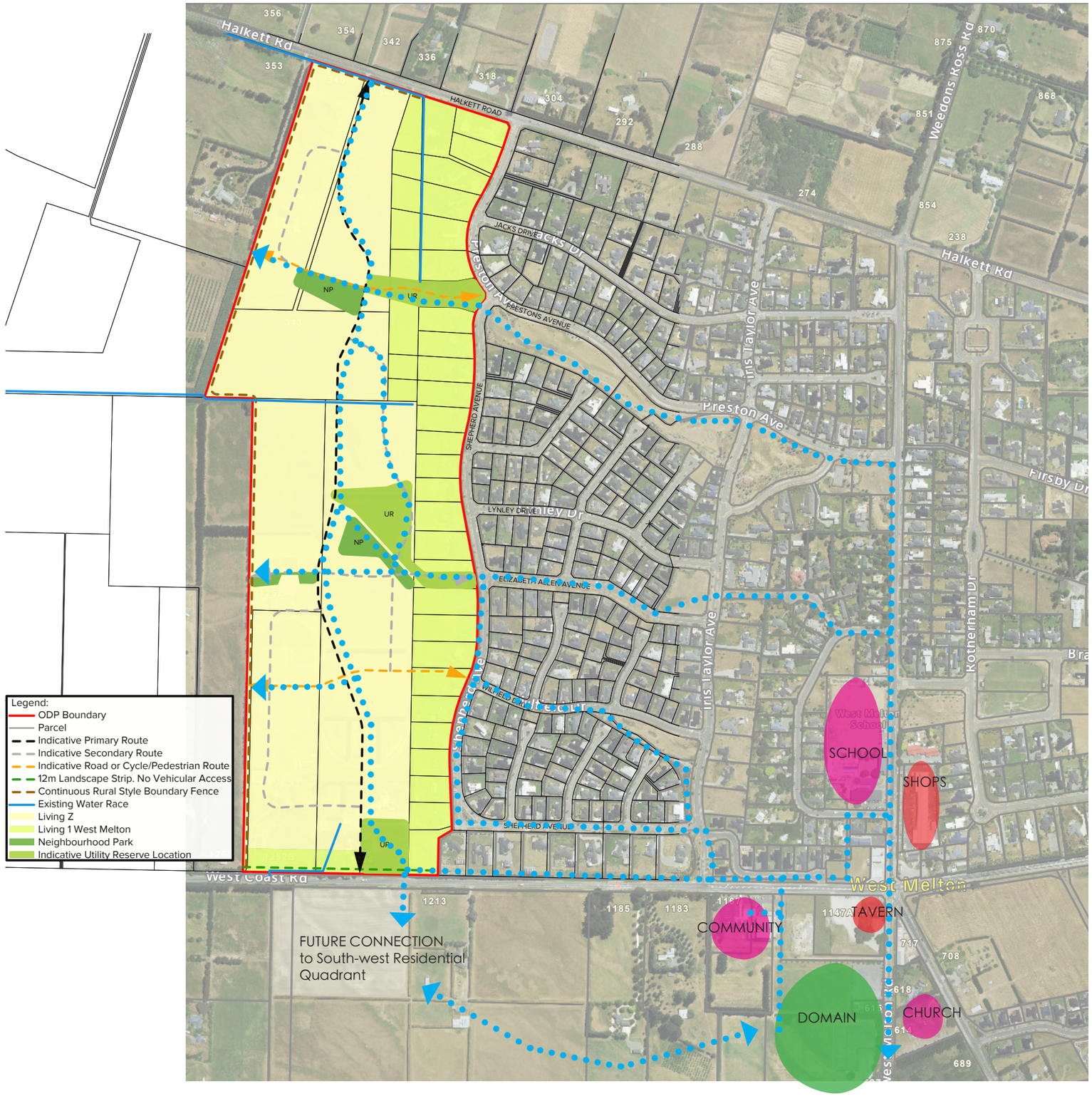
The intersection upgrade at the centre of West Melton with traffic lights and good pedestrian and cycle crossings will go some way towards overcoming the north-south severance SH73 has been allowed to create. The older community focused domain, community centre and other facilities in the south will now slowly be able to reconnect with the residential areas and the new commercial centre to the north.

As a result, the role of SH 73 will gradually change from a 'through road' to a towncentre 'main street'. As such it is be reasonable to assume that upgrades will occur along this stretch of the SH73, new footpaths and landscaping will be added to improve the amenity and safety for pedestrian and that traveling speeds will reduce drastically. SH73 will become an important link for the development not only to the towncentre but also to the southern parts of West Melton.

Refer to ODP narrative for SH treatment.

20.
*Clarification on proposed Medium Density areas and how single lot only & not comprehensive is considered appropriate to meet both the density target and also achieve a variety of housing options.*

As stated in 8. and 16 above Medium Density areas are designed and located to accommodate comprehensive medium density developments. The comprehensive MD will be the more suitable development option to achieve the desired densities within the West Melton context, as it will be able to respond to matters of character and amenity through the comprehensive design process. However, this should not mean the exclusion of small lot MD as there will most likely be scenarios where this type of MD will be able to be integrated into the 'standard' layout on smaller lots. This will also add to the variety and affordability of housing.




# PC 77 RFI - Connectivity Diagram


a+urban
architecture masterplanning urban design
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christchurch
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scale na
date: OCT 2021
designed /drawn : NL

sheet 03

# APPENDIX E | E2 RFI RESPONSE

e2 Environmental Ltd
PO Box 31159, Christchurch
www.e2environmental.com

21 October 2021

Nick Boyes
Consultant Planner
On behalf of the Selwyn District Council
Selwyn District Council

Attn: Nick

**Response to Instructure Questions from SDC RFI of 27 April 2021 - PC200077, Marama Te Wai Limited**

Please find our response to your RFI of 27 April 2021. Specifically, we have responded to the infrastructure questions 22, 23 and 25 to 27.

***Water***

*Council's current consent capacity to abstract water may limit the ability to service the development. On that basis:*

*22. Please provide the peak water demand generated by this proposed development in litres per second (l/s) and the basis for calculating this.*

Using information from the 5 Waters AMP 2021 https://extranet.selwyn.govt.nz/amps/SitePages/Greater%20West%20Melton%20Water%20Supply.aspx and from the application, the total peak demand is 25.7 L/s as shown in Table 1 below. Note that this is based on peak 24-hour demand rather than the instantaneous demand that would occur during peak times throughout the day, such as 6.00 to 9.30 am, 11.00 am to 1.00 pm and 4.00 pm to 10.00 pm.

***Table 1 Peak Water Demand***

| PC Block Demand | | | |
|---|---|---|---|
| **Calculation** | **Quantity** | **Unit** | **Reference or Comment** |
| Households | 525 | | PC application |
| pph | 2.7 | | |
| People serviced | 1418 | | |
| | | | |
| **West Melton Demand** | | | https://extranet.selwyn.govt.nz/amps/SitePages/Greater%20West%20Melton%20Water%20Supply.aspx |
| Average daily | 1283 | cu.m | |
| Peak daily | 3719 | cu.m | |
| Average daily per connection | 1.46 | cu.m | |
| | | | |
| **PC Block Requirements** | | | |
| Calculated peak daily per connection | 4.23 | cu.m | = average daily per connection x (peak daily/average daily) |
| Peak water demand | 0.05 | L/s | Per household. Calculated over a 24 hour period |
| Peak water demand | 25.7 | L/s | Total for complete development across the proposed PC development (1,428 people) |

*23. Please comment on the feasibility of being able to transfer consented water allocation as per Section 6.3, Option 3.*

As noted in the application, the suggestion of transferring consented water allocations was discussed with the SDC Asset Manager, Water Services, on 8 December 2020. This was not an offer by the Applicant to provide water allocations but rather on option for the Council to consider, in the event that allocations become available in the catchment. The Applicant is not able to provide consented allocations from land owners within the PC block, as there are only four known active wells supplying less than 10 cu.m/day each.

We note in section 8.4 of the 5 Waters Amp 2021 that:
'98L*/s of additional well yield is required between 2021 and 2050. This is proposed through four additional wells, each with 30L/s capacity.'*
Figure 8.3 of the Amp shows the forecasted water demand and the four increases in supply corresponding to the four proposed 'additional wells'. From this we conclude that the Council is anticipating growth in West Melton and that they have some confidence that the allocation associated with those wells (4 x 30 L/s = 120 L/s) is available.

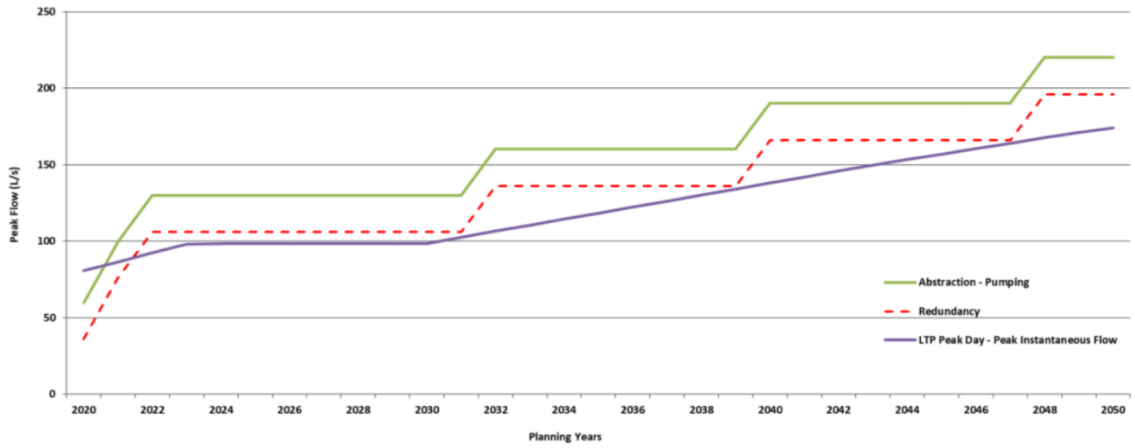



***Figure 8-3 West Melton Water Demand (5 Waters AMP 2021)***

***Wastewater***

*Council staff have stated that Option one for the wastewater – LPSS with storage and IOTA controllers for each lot – is not acceptable to the Council as it has too much risk. The Council does not have such a system employed anywhere else in the District.*

*24. Please provide the peak discharge flow rate of wastewater generated from this site in l/s and the basis for calculating this.*

Using information from the 5 Waters AMP https://extranet.selwyn.govt.nz/amps/SitePages/West%20Melton%20Wastewater%20Scheme.aspx and from the application, the total peak discharge rate is 18.0 L/s

***Table 2 Peak Wastewater Discharge Flow Rate***

| **PC Block Demand** | | | |
|---|---|---|---|
| **Calculation** | **Quantity** | **Unit** | **Reference or Comment** |
| Households | 525 | | PC application |
| pph | 2.7 | | SDC CoP |
| Population served | 1,418 | | |
| | | | |
| **West Melton Demand** | | | https://extranet.selwyn.govt.nz/amps/SitePages/West%20Melton%20Wastewater%20Scheme.aspx |
| Average daily | 357 | cu.m | |
| Peak daily | 704 | cu.m | This may not have fully taken account of i/i (depending on age of the network). Check ratio from IDS. May need to increase |
| Population served | 2,434 | | |
| | | | |
| | | | |
| **PC Block Requirements** | | | |
| Calculated average daily discharge per person | 147 | L | For the West Melton township (average daily/population served) from the Water AMP |
| Calculated peak to average daily ratio | 1.97 | | For the West Melton township (ratio of average daily/peak daily) from the Water AMP |
| ASF (volume) | 220 | L/p/d | SDC CoP Chp 6, Eq 3 |
| ASF (flow) | 0.00255 | L/s/p/d | SDC CoP Chp 6, Eq 4 |
| SPF - similar concept to calculated peak to average daily ratio | 2.00 | | Note the SDC CoP 6.4.2 storm peak factor (SPF) is 2.0, so calculated ratio is close. Use 2.0 |
| P/A | 2.50 | | To account for diurnal flow variation: SDC CoP 6.4. P/A = 2.5 |
| MF = Maximum flow occurring during wet weather (L/s) | 18.0 | L/s | MF = P/A x SPF x ASF (SDC CoP Eq 3) |

*25. Please provide an estimate of the wastewater storage volume required for Section 5.3, Option 2 (SDC vested pump station with storage – pumping outside peak times) and a comment on the feasibility of this option.*

The estimated storage requirement is 136 cu.m.

Table 3 shows the storage sensitivity calculation. The required storage volume of 136 cu.m is equivalent to 10.5 hours of storage. The following assumptions have been made:

- There is no capacity in the network to pump during the peak daily times of 6.00 to 9.30 am, 11.00 am to 1.00 pm and 4.00 pm to 10.00 pm. If this proves to be too conservative and some pumping during peak times is allowed, the required storage volume may be able to be reduced.
- There is capacity to pump outside of peak times at 1.2 x peak wastewater flow. Table 3 shows that a pump station with 136 cu.m of storage is able to completely empty during daily off-peak pump cycles.
- Level sensors could be added at a downstream MH to provide better control – ie the pump station could pump out for all situation except wet weather situations and enable the station to cease pumping during storm induced surcharge events.

***Table 3 Wastewater storage requirements for pumping outside peak times***

| Calculation | Quantity | Unit | Reference or Comment |
|---|---|---|---|
| Households | 525 | | PC application |
| pph | 2.7 | | SDC CoP |
| Population served | 1,418 | | |
| | | | |
| ASF (volume) | 220 | L/p/d | SDC CoP Chp 6, Eq 3 |
| ASF (flow) | 0.00255 | L/s/p/d | SDC CoP Chp 6, Eq 3 |
| SPF | 2.00 | | SDC CoP 6.4.2 storm peak factor (SPF) |
| P/A | 2.50 | | To account for diurnal flow variation: SDC CoP 6.4. P/A = 2.5 |
| MF = Maximum flow occurring during wet weather (L/s) | 18.0 | L/s | MF = P/A x SPF x ASF (SDC CoP Eq 3) |
| Required pump rate | 22 | L/s | 1.2 x MF |
| Min pump rate to achieve cleansing vel | 27 | L/s | |

**Storage Required to Manage System for Normal Operation - assuming ADWF throught the day**

| Time | Hours | Seconds | Volume In (L) | Cummulative Volume (L) | Pump | Time to pump out | | Volume Pumped Out (L) | Volume at the end of Pump Period (L) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Time to Pump Out (seconds) | Total Time (hrs) | | |
| 6am - 7am | 1 | 3600 | 68063 | 68063 | NO | | | 0 | 68063 |
| 7am - 9:30 | 2.5 | 9000 | 34031 | 102094 | NO | | | 0 | 102094 |
| 9:30 - 11 | 1.5 | 5400 | 20419 | 122513 | YES | 4610 | 1.28 | 122513 | 0 |
| 11am - 12pm | 1 | 3600 | 68063 | 68063 | NO | 0 | - | | 68063 |
| 12pm - 1pm | 1 | 3600 | 13613 | 81675 | NO | 0 | - | | 81675 |
| 1pm - 4pm | 3 | 10800 | 40838 | 122513 | YES | 4610 | 1.28 | 122513 | 0 |
| 4pm - 5pm | 1 | 3600 | 68063 | 68063 | NO | 0 | - | | 68063 |
| 5pm - 10pm | 5 | 18000 | 68063 | 136125 | NO | 0 | - | | 136125 |
| 10pm - 6am | 8 | 28800 | 108900 | 245025 | YES | 9220 | 2.56 | 245025 | 0 |
| CHECK TOTAL | 23 | 82800 | 421988 | | | | | | |

| | | | |
|---|---|---|---|
| 8 hours storage | 104 | cu.m | |
| Storage required from table above | 136 | cu.m | This is > 8 hours storage so it is the storage requirement |

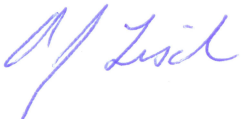
*26. Please comment on the feasibility for this proposed plan change area to be serviced by a pressure main pumping directly to the Rossington Drive wastewater pump station.*

Based on the information provided in 26, a pumping rate of around 27 L/s would require an approx (subject to design) 250 OD pressure main. This would be laid from the south of the proposed PC block approx 1.5km in the north berm of West Coast Road crossing under the Iris Taylor Avenue and Weedons Ross Road intersections, with a connection to the Rossington Drive wastewater pump station. While technically feasible, this concept would need approval from SDC and Waka Kotahi and would need to avoid the existing services water supply and wastewater pressure mains east of Weedons Ross Road.

Other options may be feasible, including a connection to the existing wastewater pressure main in West Coast Road, which would probably need to be upsized.

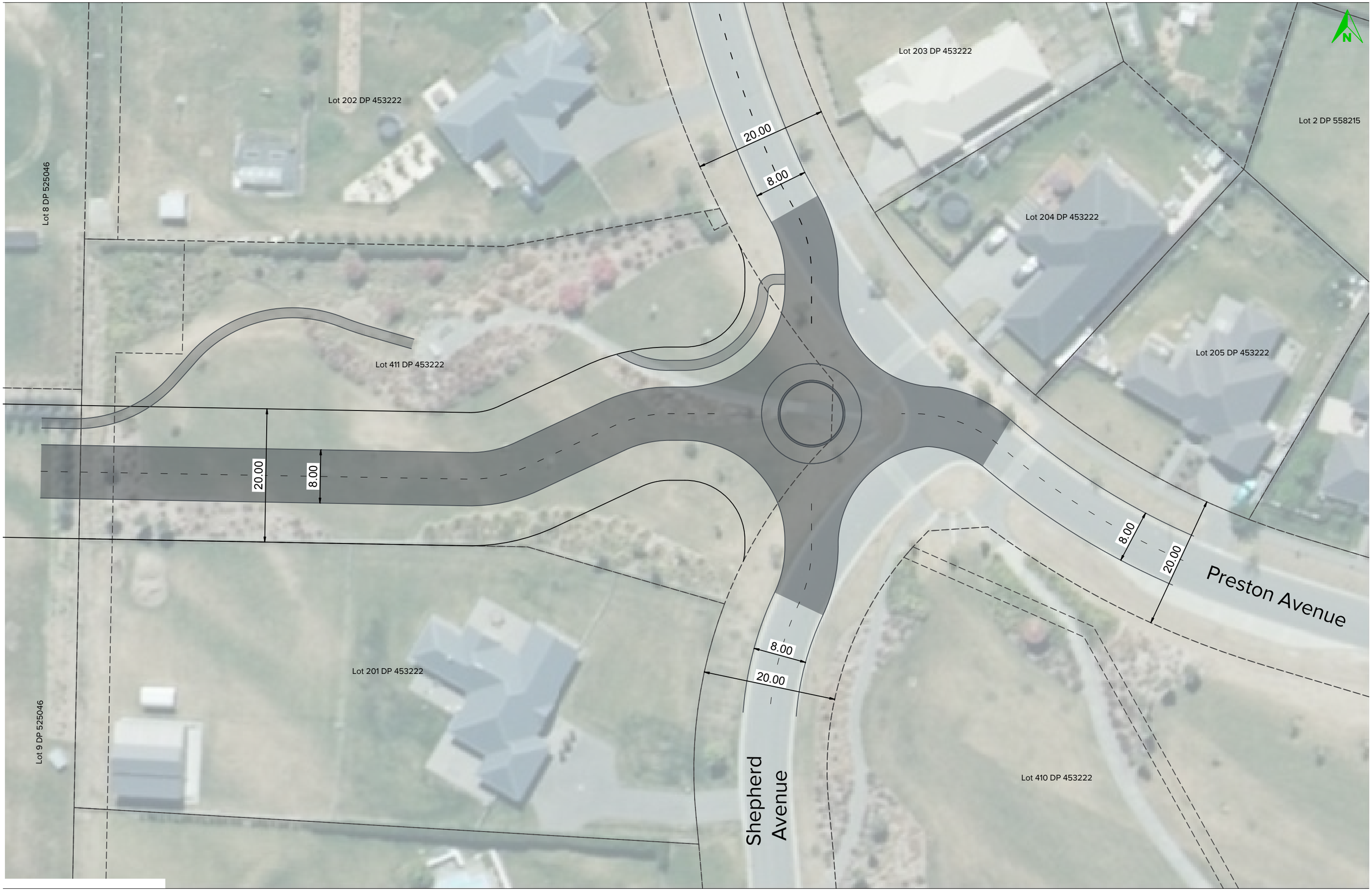
Please contact me with any questions.

Yours sincerely
**e2Environmental Ltd**



Andrew Tisch
Principal Engineer
Ph 021 90 65 38
andrew.tisch@e2environmental.com

# APPENDIX F | CONCEPTUAL INTERSECTION DRAWINGS




INOVO PROJECTS

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Auckland 1149

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# Prestons Avenue and Shepard Avenue

## Conceptual Intersection Design

| drawn | checked | drawing no. |
|---|---|---|
| SJD | | 15005-LP-03 |
| date | scale @ A3 | revision. |
| 21/10/21 | 500 | A |



O:\1. Projects\DS15000\15005 - 1234 West Coast Road (SH 73)\05 Information Management\03 Engineering\01 12d\Shepard Ave Intersections Shepard Ave Intersections Thu Oct 21 10:49:55 2021

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# Wilfred Drive and Shepard Avenue

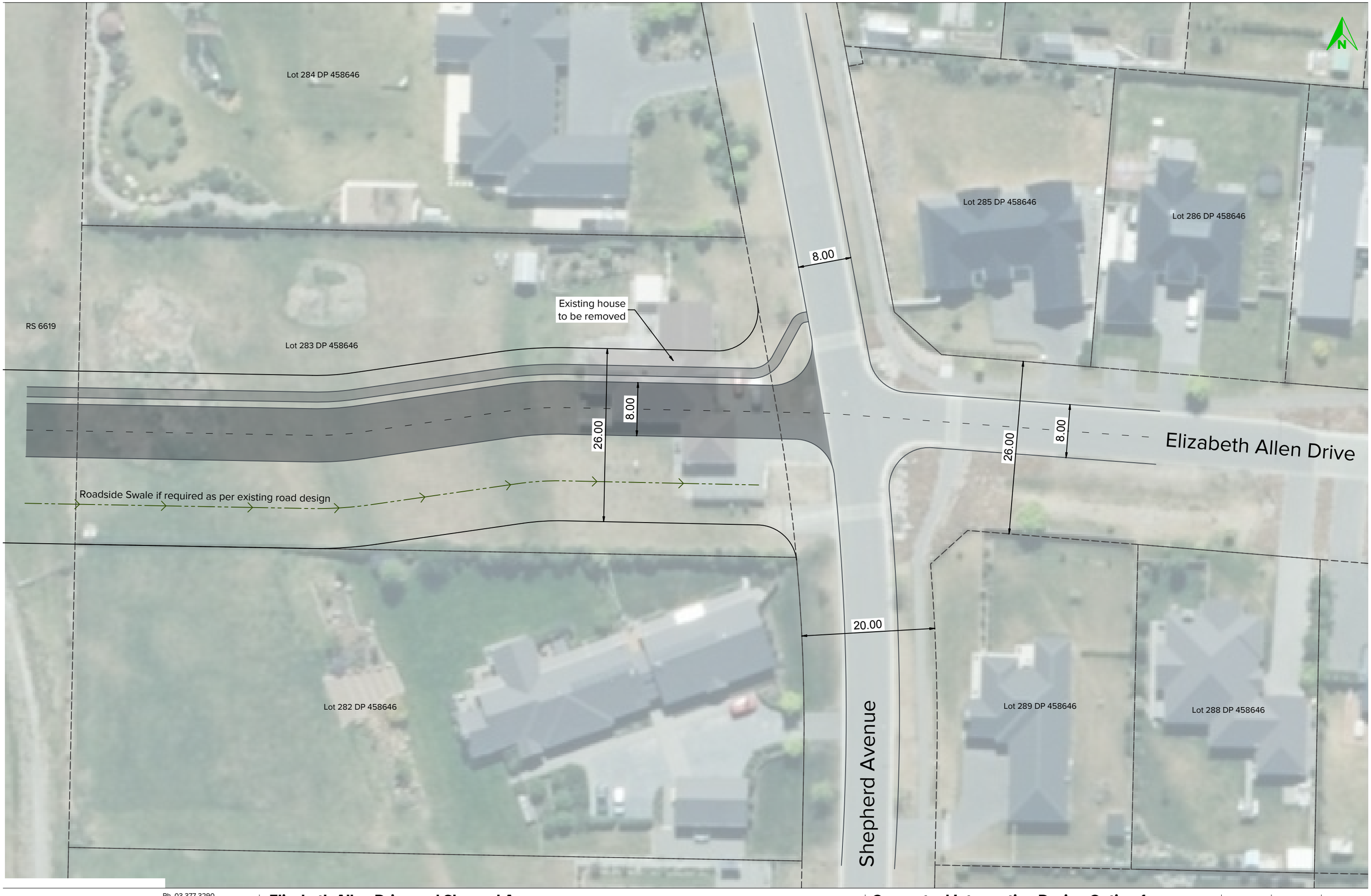
## Conceptual Intersection Design

| drawn | checked | drawing no. |
|---|---|---|
| SJD | | 15005-LP-01 |
| date | scale @ A3 | revision. |
| 19/10/21 | 500 | A |



O:\1 Projects\DS15000\15005 - 1234 West Coast Road (SH 73)\05 Information Management\03 Engineering\01 12d\Shepard Ave Intersections Shepard Ave Intersections Thu Oct 21 10:34:48 2021

Doc: INOVO SURV A3 TOPO TBF

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# Elizabeth Allen Drive and Shepard Avenue

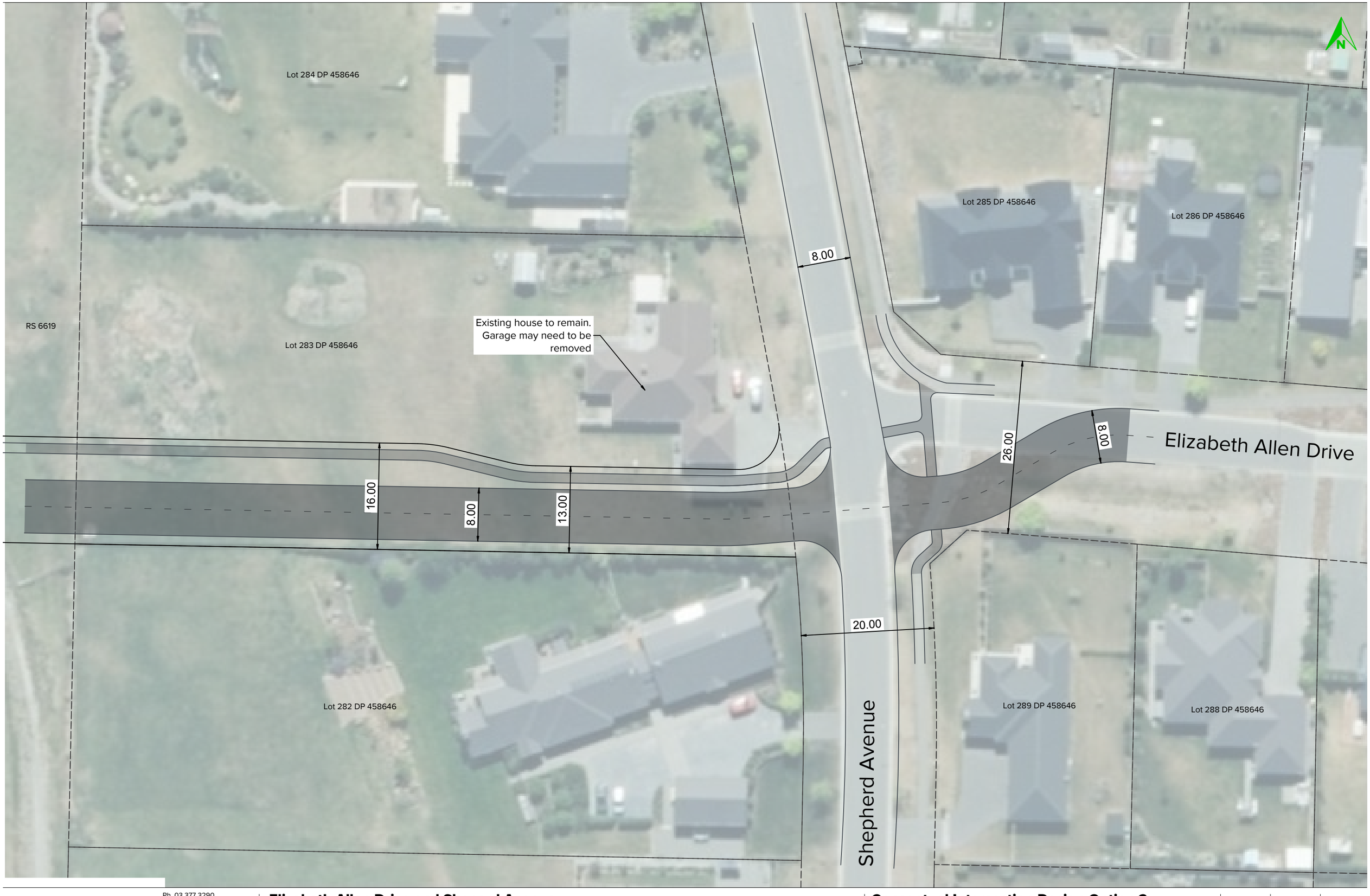
## Conceptual Intersection Design Option 1

| drawn | checked | drawing no. |
|---|---|---|
| SJD | | 15005-LP-02 |
| date | scale @ A3 | revision. |
| 19/10/21 | 500 | A |



O:\1. Projects\DS15000\15005 - 1234 West Coast Road (SH 73)\05 Information Management\03 Engineering\01 12d\Shepard Ave Intersections Shepard Ave Intersections Thu Oct 21 11:31:44 2021

Doc: INOVO SURV A3 TOPO TBF

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# Elizabeth Allen Drive and Shepard Avenue

## Conceptual Intersection Design Option 2

| drawn | checked | drawing no. |
|---|---|---|
| SJD | | 15005-LP-02/2 |
| date | scale @ A3 | revision. |
| 21/10/21 | 500 | |

# APPENDIX G | INDICATIVE OUTLINE DEVELOPMENT PLAN

HALKETT ROAD

JACKS DRIVE

PRESTONS AVENUE

SHEPHERD AVENUE

LYNLEY DRIVE

ELIZABETH ALLEN AVENUE

WILFIELD DRIVE

SHEPHERD AVENUE

WEST COAST ROAD - SH 73

NP

UR

NP

UR

NP

UR

Legend:

- ODP Boundary
- Parcel
- Indicative Primary Route
- Indicative Secondary Route
- Indicative Road or Cycle/Pedestrian Route
- 12m Landscape Strip. No Vehicular Access
- Continuous Rural Style Boundary Fence
- Existing Water Race
- Living Z
- Living 1 West Melton
- Neighbourhood Park
- Indicative Utility Reserve Location

Note:
Up to 20% of the ODP may be developed as medium density to be determined at the time of subdivision. Suitable locations may include adjoining reserves, and in small clusters throughout the ODP area



# Outline Development Plan

OVERALL Plan
West Melton