



Appendix C

Integrated Traffic Assessment



GW Wilfield Ltd

Plan Change Living West Melton
(Living WM) South Zone

Integrated Transport Assessment

August 2018

GW Wilfield Ltd

Plan Change Living West Melton (Living WM) South Zone

Integrated Transport Assessment Quality Assurance Statement

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1. Introduction

TDG now Stantec have been asked to prepare an Integrated Transport Assessment for a proposed residential Plan Change covering the Wilfield Subdivision, located in West Melton. The Wilfield Subdivision is in the south-eastern quadrant of the West Melton Township, with 180 residential lots consented. As of 31 May 2018, 55 houses were constructed and a further 33 houses were under construction within the subdivision.

GW Wilfield Ltd propose to request a Private Plan Change to the Selwyn District Plan to re-zone the existing extent of the subdivision to a new Living West Melton (Living WM) South Zone. The land is currently a mixture of Living 2 and Living 2A land. In addition, the portion of the District Plan Appendix 20 Outline Development Plan – West Melton covering the site will be replaced with a new Outline Development Plan for the Living West Melton (Living WM) South Zone.

Existing consented subdivision has occurred in a way that lot density is higher than originally envisaged by the Living 2 and Living 2A zone. This has left large balance lots where additional subdivision is not permitted. The Plan Change will allow the balance lots to be further subdivided in a way that is consistent with existing subdivision, as well as better reflecting existing subdivision density.

Based on concept subdivision plans, the Plan Change would allow approximately 252 residential lots in the new zone, up from the consented 180 residential dwellings. Of the 72-lot increase, approximately 31 are in the balance lots in the exiting Living 2 zone, and 41 are in the balance lot in the existing Living 2A zone. For the purpose of this report, these are two distinct areas, referenced as the additional development in the Living 2 and Living 2A zones respectively.

The additional development in the Living 2 area will readily connect to the existing road network, with only a low level of additional roading infrastructure required. The additional development in the Living 2A area will be accessed via an extension of Ridgeland Way (to Kingsdowne Drive), with additional pedestrian connections also available.

This Integrated Transport Assessment assesses the proposed transport connections provided by the ODP, and transportation related impacts of the increase in the number of lots that can be developed with the proposed Plan Change.

2. Site Location

Figure 1 shows the location of the Wilfield subdivision and the proposed Plan Change site within the context of the wider transport network. The subdivision is located to the south-east of the West Melton Township. It lies directly south of State Highway 73 (SH73), opposite Gainsborough subdivision and to the east of Weedons Ross Road.

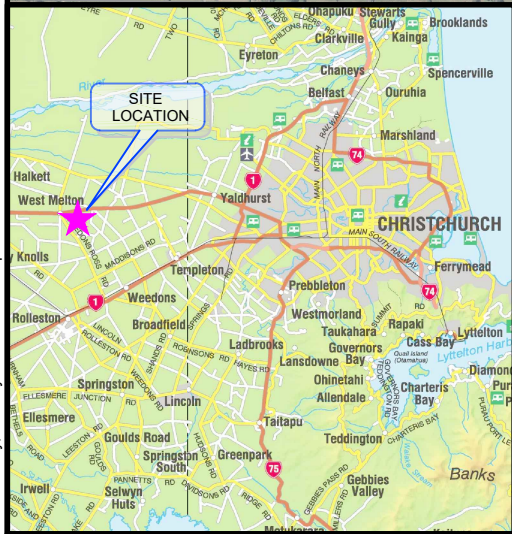
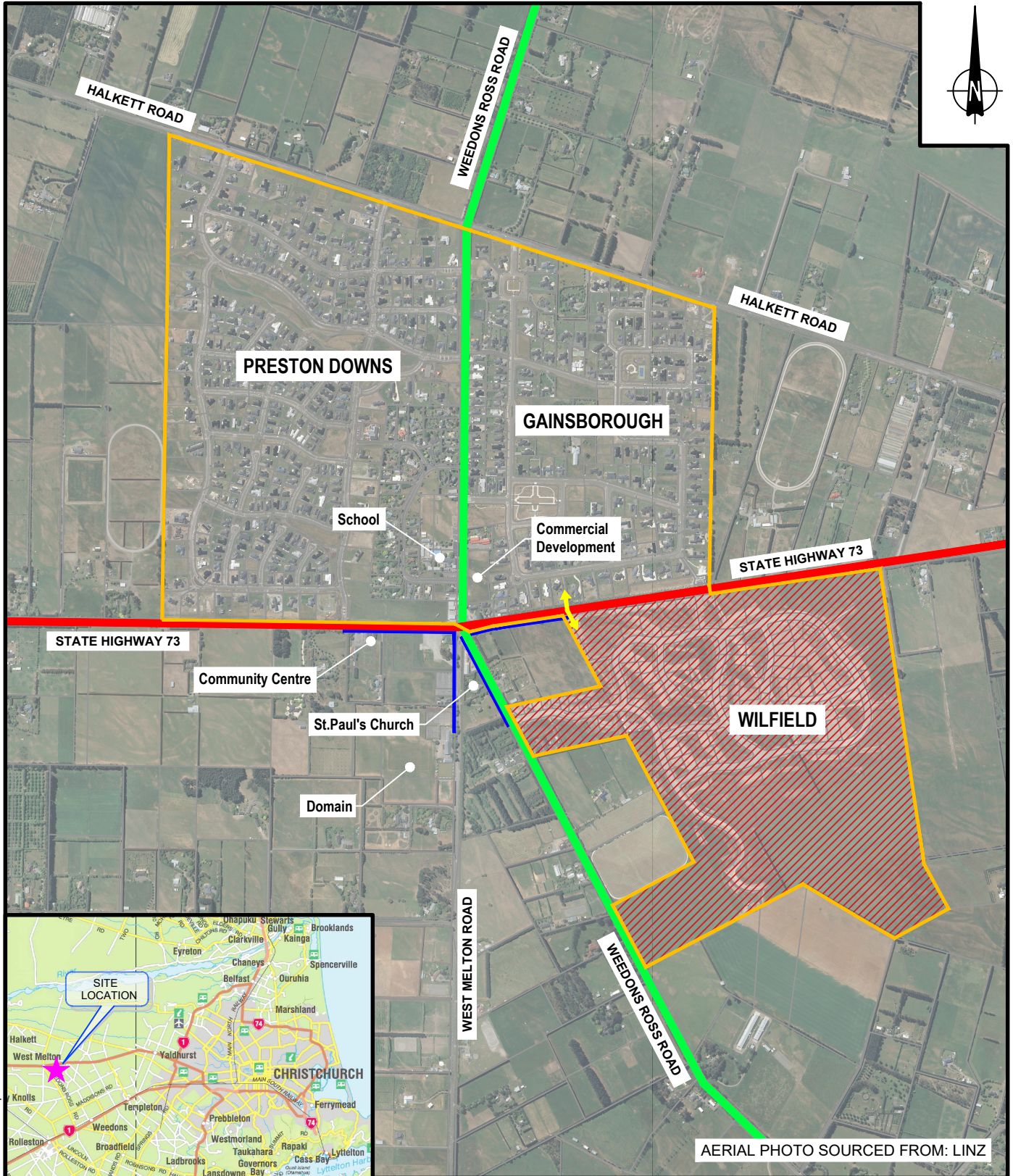
West Melton is approximately 14km west of the Christchurch urban boundary. SH73 is the main route between Christchurch and the West Coast via Arthur's Pass. It is classified as an arterial road in the Selwyn District Plan. Weedons Ross Road provides another important link within the Selwyn District, connecting West Melton to the Rolleston area which is approximately 10km to the south of the site. Weedons Ross Road is classified as an Arterial Road.

St Paul's Anglican Church and a small number of businesses are located on Weedons Ross Road south of West Melton Road. The West Melton Domain, Community Centre and Tavern are also on the southern side of SH73 and west of Weedons Ross Road.

West Melton School and the West Melton Shopping Centre are located on Weedons Ross Road to the north of SH73. Most of the other existing developed residential areas are located north of SH73, with Gainsborough to the east of Weedons Ross Road, and Preston Downs to the west.

Figure 2 shows the current West Melton subdivision, with the balance lots yet to be subdivided. It is understood there are some small parts of the subdivision which have subsequently been further subdivided or are subject to subdivision approval, however the plan shows the general subdivision layout and the locations of the balance lots.

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AERIAL PHOTO SOURCED FROM: LINZ

KEY			
	Strategic Road		Pedestrian Linkage
	Arterial Road		Urban Boundary
	Existing Footpaths South of SH73		Site

WILFIELD SUBDIVISION - PROPOSED PLAN CHANGE

SITE LOCATION & EXISTING TRANSPORT ENVIRONMENT



1

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3. Existing Transport Infrastructure

3.1 SH73

Along the Wilfield subdivision frontage, SH73 is formed as a two-lane rural road.

Photograph 1 shows SH73 along the subdivision frontage. The road has a generally straight east to west alignment, with one bend at the Weedons Ross Road intersection.



Photograph 1: Wilfield Subdivision SH73 Frontage- Looking West

There is a footpath on the southern side of SH73 (**Photograph 2**) which runs from the Weedons Ross Road intersection to a crossing point between Wilfield and Gainsborough. There is a pedestrian refuge island at the crossing point, which is shown in **Photograph 3**. This was put in place instead of the underpass referenced in the District Plan subdivision rules (rule 12.1.3.55 (b)).

The 70km/h speed limit restriction for West Melton starts outside the subdivision, approximately 500m east of the Weedons Ross Road intersection and in advance of the pedestrian crossing point. As part of corridor improvements, the speed limit was relocated from its previous position closer to the Weedons Ross Road intersection.



Photograph 2: SH73 Footpath along Wilfield Frontage



Photograph 3: SH73 Pedestrian Crossing between Wilfield and Gainsborough (from Gainsborough)

3.2 SH73 / Weedons Ross Road Intersection

The SH73 / Weedons Ross Road intersection is a priority-control cross-road intersection with Stop signs on Weedons Ross Road. There are right turn bays marked on both SH73 approaches. Both Weedons Ross Road approaches only have sufficient width for one lane of queuing traffic, although there is space for two vehicles at the stop line. **Photographs 4 and 5** show the intersection.



Photograph 4: SH73 / Weedons Ross Road Intersection, from SH73 Eastern Approach



Photograph 5: Southern Approach to Weedons Ross Road / SH73 Intersection, West Melton Road on the Left

West Melton Road meets the western side of Weedons Ross Road only approximately 15m south of the SH73 intersection.

3.3 Weedons Ross Road

Weedons Ross Road, south of SH73, has a flat and straight alignment. The width of the sealed carriageway varies from 6.0m-6.3m in the vicinity of the subdivision.

North of the northern Kingsdowne Drive intersection (**Photograph 6**), there is a gravel shoulder and a sealed footpath with kerb and channel on the western side of the road

along the church frontage. Further north (i.e. close to the West Melton Road intersection) the seal is widened to provide for car parking outside the businesses.

The northern Kingsdowne Drive footpath connects to Weedons Ross Road and there is a kerb cutdown crossing point for pedestrians to cross to the footpath on the western side of the road (**Photograph 7**).



Photograph 6: Weedons Ross Road, Northern Kingsdowne Drive Intersection on Left



Photograph 7: Footpath Connection to Wilfield Subdivision North of Kingsdowne Drive Intersection

3.4 Kingsdowne Drive

Kingsdowne Drive is a loop road which provides the only two points of access to the Wilfield subdivision currently. At the northern and southern ends of the subdivision, Kingsdowne Drive meets Weedons Ross Road at priority-control T-intersections.

Within the subdivision, Kingsdowne Drive has a 9m wide carriageway and one footpath.



Photograph 8: Kingsdowne Drive / Weedons Ross Road Southern Intersection



Photograph 9: Kingsdowne Drive, Ridgeland Way on the Right

3.5 Ridgeland Way

As shown in **Photograph 9**, Ridgeland Way meets Kingsdowne Drive at a local T-intersection. Ridgeland Way is currently formed as a short cul-de-sac with an 8m wide carriageway and one footpath.



Photograph 10: Ridgeland Way

3.6 Silver Peaks Drive

Silver Peaks Drive forms a secondary loop road within the subdivision connecting to Kingsdowne Drive at each end. It has been formed with a 9m wide carriageway.

3.7 Off-Road Cycle / Pedestrian Provision

Generally within the subdivision, pedestrians are provided with footpaths within the road corridors and cyclists are expected to share the subdivision roads with traffic.

There are several off-road connections, primarily intended for pedestrians, but which can also be used by cyclists. These include a link from the north-western corner of the subdivision to the crossing point on SH73, linking to the Gainsborough subdivision across the road.

3.8 Bus Network

Red Bus has previously operated an express commuter bus service on weekdays from Darfield to Christchurch City in the morning, with a return in the evening. The service had a stop in West Melton at the tavern at 7:35am on the inbound service, and 6:10pm on the outbound service. To and from West Melton, the service took approximately 40 minutes to reach the city centre bus exchange. It is understood the service is currently not running due to insufficient demand and high running costs.

4. Current Travel Patterns

4.1 Daily Traffic Patterns

Daily traffic volumes for SH73, in the vicinity of West Melton, Weedons Ross Road and West Melton Road have been sourced from NZTA and the Selwyn District Council (SDC) and are shown in **Table 1**. The SH73 volumes are annual average daily traffic (AADT) volumes for 2017. The count location east of Dawsons Road is approximately 5km east of West Melton, while the count location east of Aylesbury Road is approximately 7km west of West Melton.

Count Location	Year	Daily Traffic Volumes
SH73 east of Dawsons Road	2017	11,200 vpd
SH73 east of Aylesbury Road	2017	7,200 vpd
Weedons Ross Road south of Newtons Road	2017	2,000 vpd
West Melton Road west of Weedons Ross Road	2014	1,300 vpd

Table 1: Daily Traffic Volumes on Surrounding Roads

The AADT at the SH73 count site west of West Melton has grown at approximately 4% per annum over the last 10 years.

4.2 Hourly Patterns

Figure 3 shows the pattern of hourly traffic volumes on Weedons Ross Road, south of SH73 (between Newtons Road and Maddisons Road), recorded by the Selwyn District Council over the course of a seven-day period in February 2017. The main characteristics of the two-way hourly traffic patterns can be summarised as follows:

- The weekday morning and evening two-way peak hour traffic volumes are approximately 180 vehicles per hour (vph) between 7:00am – 8:00am (of which 110vph is southbound), and 5:00pm – 6:00pm (of which approximately 150vph is northbound);
- The two-way weekday traffic volumes drop gradually to approximately 100vph around midday;
- The weekend traffic volumes are typically about 150vph between 11:00am – 5:00pm.

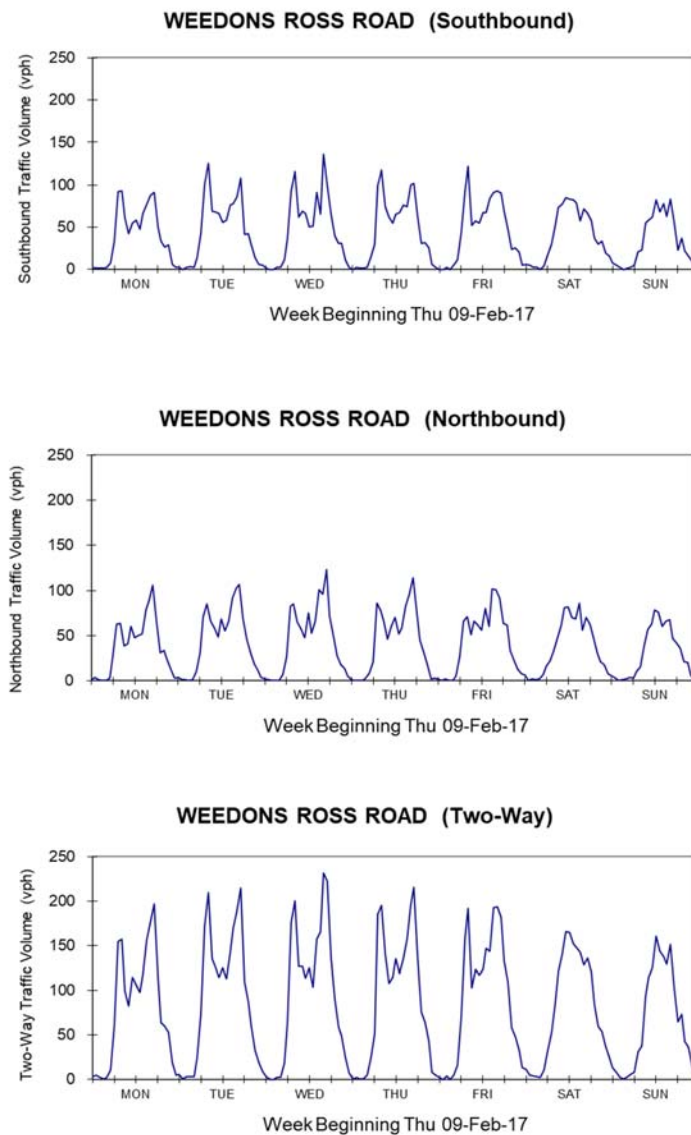


Figure 3: Pattern of Hourly Traffic Volumes – Weedons Ross Road

4.3 Intersection Traffic Volumes

TDG now Stantec undertook turning movement surveys at four key intersections on Wednesday 20 May 2018. The intersections surveyed were:

- SH73 / Weedons Ross Road;
- Weedons Ross Road / West Melton Road;
- Weedons Ross Road / Kingsdowne Drive North; and
- Weedons Ross Road / Kingsdowne Drive South.

The traffic surveys were conducted during the morning and evening peak periods of 7:00am to 9:00am and 2:45pm to 6:00pm respectively. The evening traffic survey included the end of the school day which generates a short duration peak from 2:45pm to 3:15pm. The peak hours in each period occurred from 7:15am to 8:15am and 4:45pm to 5:45pm. **Figures 4 and 5** summarise the surveyed peak hour traffic volumes in each period.

Traffic volumes on SH73 eastbound are relatively high in the morning peak period as drivers are headed to Christchurch for work and vice versa in the evening.

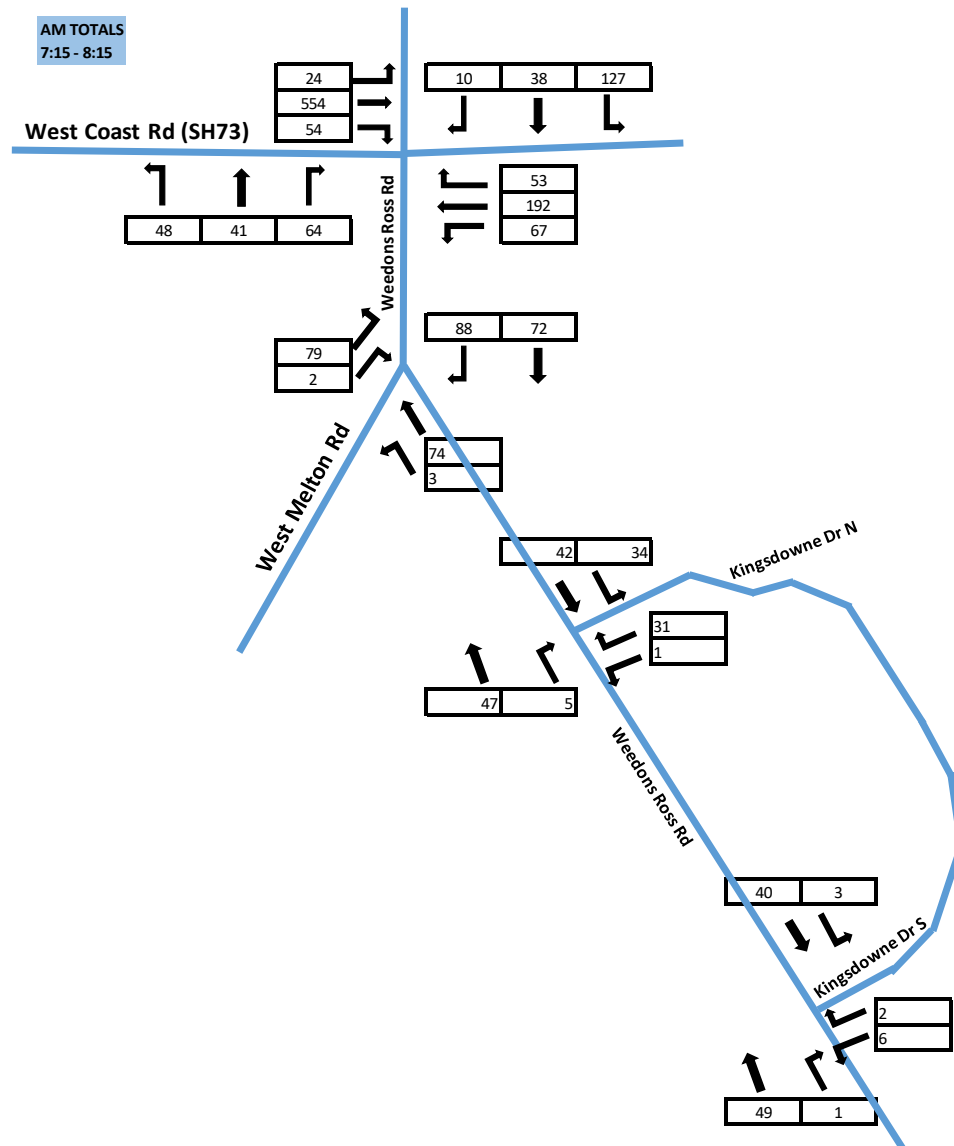


Figure 4: Existing AM Peak Hour (7:15am-8:15am) Turning Volumes (May 2018)

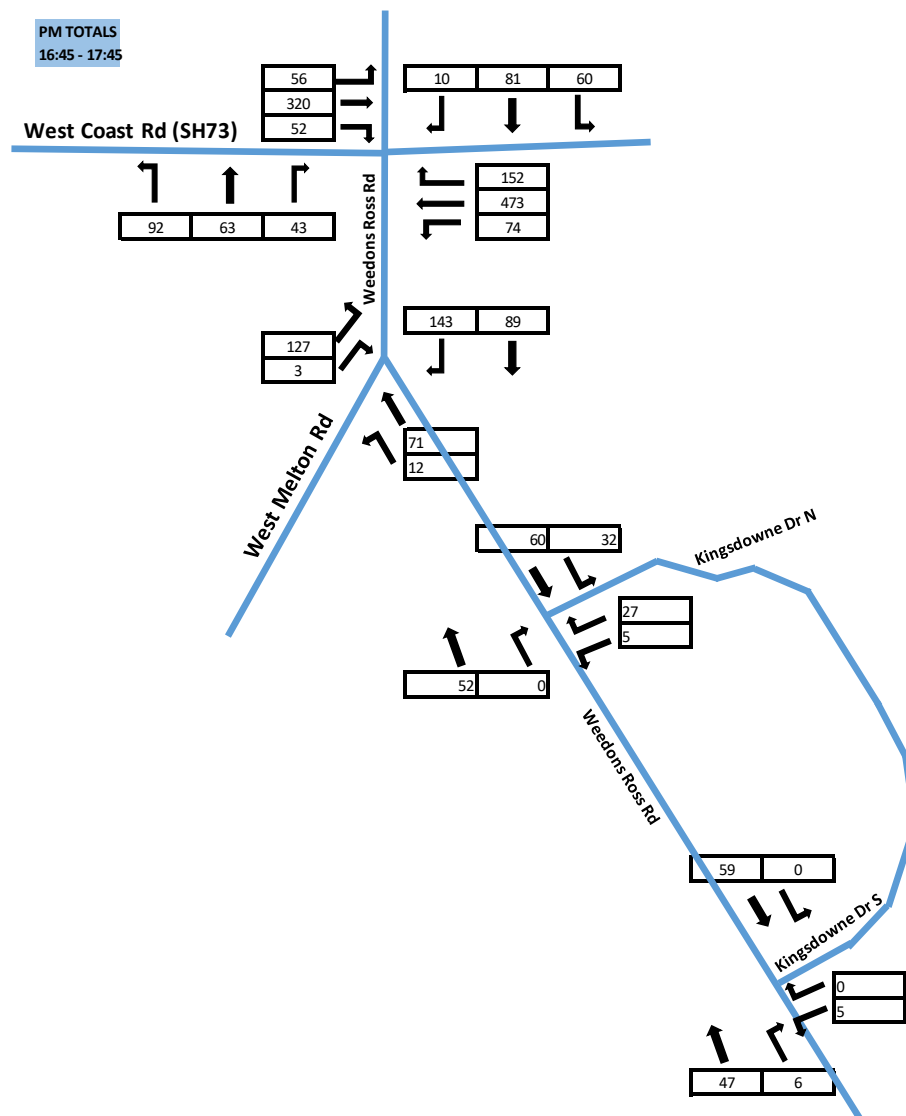


Figure 5: Existing PM Peak Hour (16:45pm-17:45pm) Turning Volumes (May 2018)

4.4 SH73 / Weedons Ross Road Intersection Performance

From the turning movement survey video footage, a delay survey was carried out for the SH73 / Weedons Ross Road intersection. Average stopline delays (includes queuing time) for the two Weedons Ross Road approaches were calculated and are reported below.

Approach	AM Peak Average Delay	PM Peak Average Delay
Weedons Ross Road South	32s	49s
Weedons Ross Road North	17s	30s

Table 2: Average Weedons Ross Road Approach Peak Hour Stopline Delays at SH73 Intersection

The intersection is currently operating with quite high delay during peak times. The delays on the southern approach to the intersection are higher than those on the northern approach due to the higher right turn volumes and represent levels of service D-E for drivers.

During the morning peak period, up to six vehicles were observed queued on the southern Weedons Ross Road approach to the intersection, with up to four vehicles queued on West Melton Road. From observations, the queues do clear and there are times where there is little or no queuing. There is interaction between the queue on Weedons Ross Road and the queue on West Melton Road given the proximity of the two intersections.

The following figures show the average delays on the two Weedons Ross Road intersection approaches by 15-minute periods. The average delays clearly peak during some 15-minute periods and are much lower during others. This fits with observations that queues do clear and there are periods with minimal queuing.

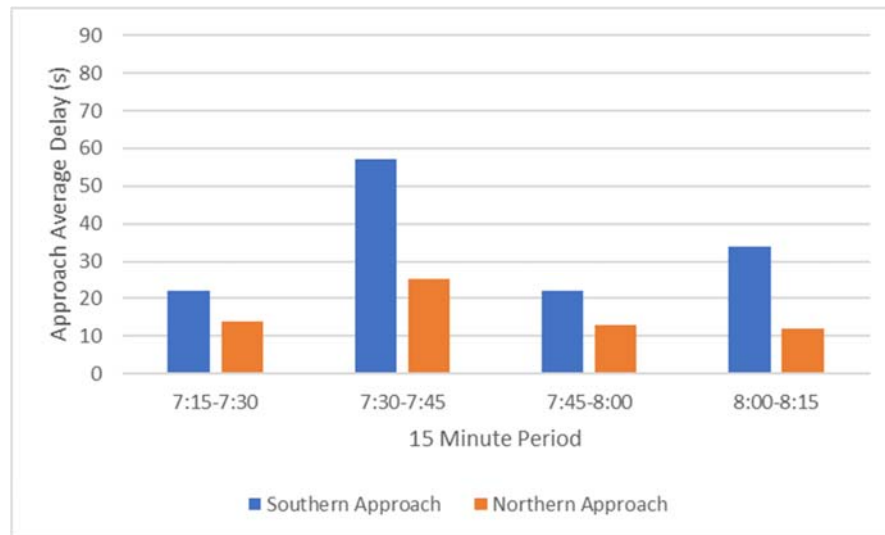


Figure 6: Morning Peak Hour Approach Average Delays by 15 Minute Period

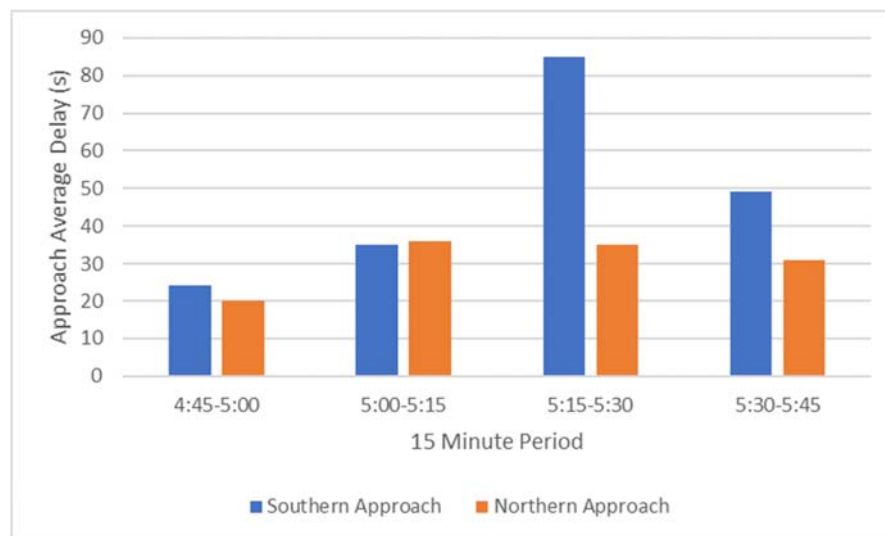


Figure 7: Evening Peak Hour Approach Average Delays by 15 Minute Period

5. Road Safety

A review of the reported road crashes surrounding the area of the proposed Plan Change has been carried out using NZTA's Crash Analysis System. The review covered a radius of 1.5km from the SH73 / Weedons Ross Road intersection. Crashes during the most recent full five-year period of 2013 – 2017 have been analysed. At the time of analysis (June 2018) there are no records of any crashes occurring in 2018.

A total of 21 crashes have been reported across the search area. One was fatal, one resulted in serious injury and three in minor injury.

The fatal crash occurred on Weedons Ross Road at a bend in the road about 400m south of the southern Wilfield subdivision access. The driver lost control and crashed into a tree late at night, with alcohol being a factor.

The serious injury crash occurred on Weedons Ross Road north of Halkett Road when a driver crashed into a fallen tree.

These two serious incidents were isolated incidents and do not present significant safety concerns with the traffic environment or road network layout.

Four non-injury crashes were reported at the SH73 / Weedons Ross Road intersection. Two involved drivers on Weedons Ross Road crossing SH73 failing to give-way to vehicles on SH73; one from the northern approach and one from the southern approach. One crash involved a vehicle turning right into Weedons Ross Road failing to give-way to an oncoming vehicle, and the other involved a large truck and trailer turning left colliding with a car that drove down the left side of it.

This complex intersection has been a safety concern for the community due to the delays. However the existing safety record of no injury crashes does not highlight the intersection as a current high risk intersection with serious safety issues. Recent lowering of speed limits may be assisting with minimising severity of crashes.

Four crashes, including one minor injury crash, were reported at the Weedons Ross Road / Halkett Road intersection. This intersection is more than 1km from the Wilfield subdivision.

The other crashes reported within the search radius were one-off occurrences spread across the search area. Generally, they were typical rural crash types and did not highlight any safety concerns with the surrounding road network.

No crashes have been reported at either of the Weedons Ross Road / Kingsdowne Drive intersections.

6. Future Development

6.1 Christchurch Southern Motorway Stage 2

The Christchurch Southern Motorway Stage 2 (CSM2) is currently under construction. The Southern end of the CSM2 alignment is shown below. The CSM2 will start at Rolleston and a full interchange will be provided at Weedons Ross Road. The CSM2 will be expected to improve travel times and travel time reliability from Rolleston into Christchurch. The CSM2 could provide a route option for travel from Wilfield to the southern part of Christchurch.



Figure 8: CSM2 Alignment- Southern End (NZTA Website)

6.2 Weedons Ross Road Seal Widening

The Selwyn District Council has proposed to improve seal widths and address ongoing maintenance issues, such as edge breaks, along Weedons Ross Road (along the 5.3km from Maddisons Road to near West Melton). The proposed timeframe for completion is 2020/2021.

6.3 West Melton Corridor Management Plan

As part of the Wilfield subdivision planning, a Corridor Management Plan was developed in partnership with NZTA and Selwyn District Council for the section of SH73 through the West Melton township. The aim of the plan is to connect the different parts of West Melton for pedestrians and cyclists and to provide a consistent layout for SH73 within the West Melton limits.

The pedestrian crossing between Wilfield and Gainsborough has been installed and the 70km/h speed limit restriction has been extended further east, to allow for that, as outlined in the plan.

The plan includes a possible additional crossing point west of the Weedons Ross Road intersection to link the southern parts of West Melton with the township.

The Corridor Management Plan identified that NZTA and Selwyn District Council would investigate long term improvements at the SH73 / Weedons Ross Road intersection. NZTA currently have no publicly published plans for modifications to SH73 within West Melton. As part of previous consents a range of options for the intersection had been considered. It is considered traffic signals would best address the turning movement delays within the land constraints of the intersection. However, the use of signals in a rural township would require careful consideration as they are less in context. A roundabout is another option, but requires extensive land purchase requirements as a large 35m diameter roundabout island would most likely be required.

Similarly, it is understood Selwyn District Council have no plans for changes to the transport network within the southern part of West Melton.

6.4 Future Cycling Network

The Selwyn District Council Walking and Cycling Strategy Action Plan identifies a potential district cycle route on West Melton Road linking West Melton to Rolleston. The route is at this stage planned for 2026/27.

7. Proposed Plan Change

7.1 Overview

It is proposed to re-zone the Wilfield subdivision from a mixture of Living 2 and Living 2A to a new Living West Melton (Living WM) South Zone. This will allow balance lots to be subdivided to a similar density as existing residential subdivision. This would potentially increase the lot yield of the area from a maximum of 180 lots to approximately 252 lots, an increase of approximately 72 lots. The new zoning will be supported by a replacement Outline Development Plan (ODP) covering the new zone area.

Figure 9 shows the proposed ODP for the Living WM South zone.

7.2 Subdivision Access

The two intersections at either end of Kingsdowne Drive are currently the only access points to the Wilfield Subdivision. Each is formed as a simple T-intersection with give-way sign control. No changes to the intersection forms are proposed for the Plan Change.

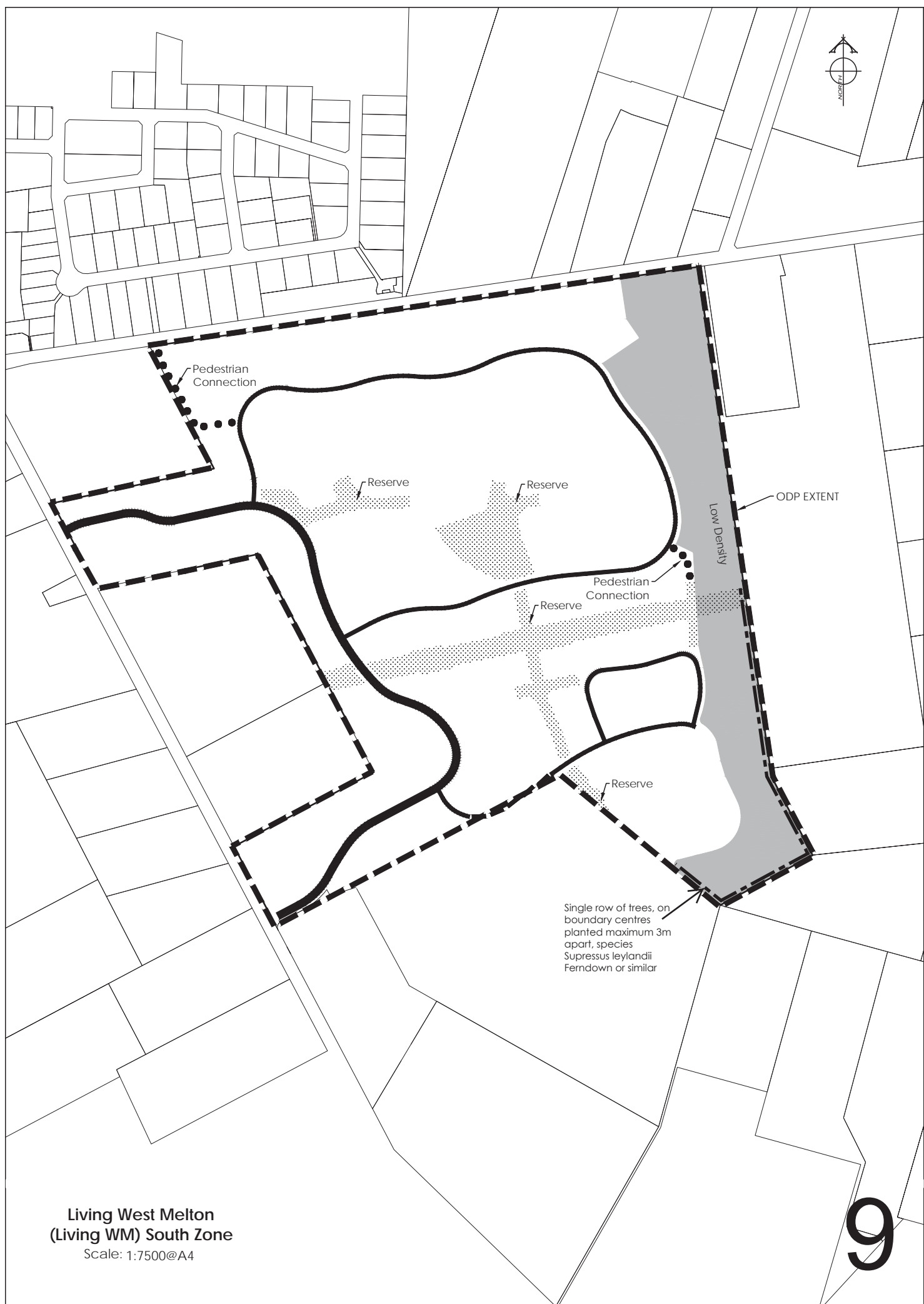
Future access to Wilfield subdivision could be provided through adjacent land, also accessed from Weedons Ross Road, but at this stage there are no development plans for any of the immediately adjacent properties.

7.3 Internal Roding

The ODP shows key structuring elements of the existing and future road network. For the existing formed road network, it highlights Kingsdowne Drive and Silver Peaks Drive as primary and secondary loop roads respectively. Through subdivision processes other local roads will connect to those roads.

All traffic entering the Wilfield subdivision uses Kingsdowne Drive which is a local road with a 9m wide carriageway and a 50km/h speed limit. Silver Peaks Drive then provides access into the northern part of the subdivision.

Ridgeland Way is also shown on the ODP, as it at least initially will be the only road into the south-eastern part of the Plan Change area, servicing the balance lot in the existing Living 2A zone. It is currently a short cul-de-sac with an 8m wide carriageway and a 50km/h speed limit. An extension of Ridgeland Way is shown, together with a loop road that will allow for connectivity for pedestrians to the adjacent reserve. It is anticipated that Ridgeland Way could be extended further south to access the southernmost lots. It will be appropriate for future subdivision processes to consider the need for future connectivity to adjacent blocks of land in case zoning patterns change in the future through the RPS, a District Plan review, or Plan Changes.



7.4 Pedestrians / Cyclists

The site includes a well-established and connected pedestrian and cycle network. Within Wilfield subdivision, there are footpaths, both next to all roads and within off-road corridors, providing access to all parts of the development. Externally, these footpaths connect to pedestrian infrastructure on Weedons Ross Road, the southern side of SH73 and across SH73 to Gainsborough.

Cyclists will be able to use the off-road links through Wilfield and would be expected to share subdivision roads with traffic, which is typical for local roads in residential subdivisions.

Provision has been made in the ODP for the existing Living 2A area, by showing the minor loop road with connections to existing reserves, and then through to Silver Peaks Drive.

7.5 Public Transport

It is unclear whether West Melton will have an ongoing bus service. It has recently been serviced by a commuter bus, but there had been low regular demand for the service.

Public transport uptake by residents of the yet to be developed areas in the Plan Change area would be low, due to the longer walking distance. If a bus service connected West Melton to Rolleston, there would be an option to utilise Kingsdowne Drive to minimise walk distances. As the road is already constructed, and there is uncertainty with the future provision of services when Wilfield is fully developed, specific public transport infrastructure is not included in the Plan Change provisions. However, the well-connected pedestrian network does facilitate walking access if a route is provided. As such, if a service is provided the zone provides a basic level of public transport accessibility for more mobile residents and visitors, or as a park and ride option.

8. Traffic Generation / Distribution

8.1 Traffic Generation

A daily traffic generation rate of six vehicle movements per day (vpd) per household has been used and accepted previously in West Melton. This is lower than the 9-10vpd per household rate used in cities due to the rural location of West Melton and the likelihood of residents making linked trips e.g. visiting the supermarket and the petrol station on their way home from work in Christchurch.

It is noted that the intersection traffic counts carried out recently could not reliably be used for calculating traffic generation of the existing households due to the large proportion of houses currently under construction and the associated unknown construction traffic generation.

It is expected that 10% of the daily traffic movements generated by the development will occur within the morning and evening peak hours.

Table 3 summarises the forecast traffic generation for the consented Wilfield subdivision and the potential extra lots in the Plan Change area.

Scenario	Number of Lots	Daily Traffic Generation	Peak Hour Traffic Generation
Consented Subdivision	180	1,080vpd	108vph
Extra Traffic Generation Associated with Rezoning	72	432vpd	43vph
Total	252	1,512vpd	151vph

Table 3: Site Traffic Generation Summary

The extra 72 lots that could be developed in the Plan Change area would represent an increase of 40% in the number of lots in the subdivision. The corresponding increase in subdivision traffic generation would equate to approximately 43 vehicle movements per hour (vph) during the peak hours.

8.2 Traffic Distribution

Currently 15%-20% of traffic generated by the Wilfield subdivision is entering from and exiting to the south along Weedons Ross Road. With the ongoing increase in employment opportunities in Rolleston and the easy access to the CSM2 via the Weedons Ross Road interchange, it is considered the proportion of traffic to/from the south could increase to 25%.

Based on previous analysis for West Melton using Census journey to work data, it is estimated that 10% of journeys could be to / from West Melton or the rural areas surrounding West Melton, and the remainder would be to the east towards Christchurch.

The following table contains the estimated distribution of both the traffic generated by the consented Wilfield subdivision and the additional traffic that could be generated if the proposed Plan Change is approved.

Direction	Consented Wilfield- 180 Lots	Proposed Plan Change- Extra 72 Lots
South- Weedons Ross Road	27vph	11vph
East- SH73	70vph	28vph
North- Weedons Ross Road	5vph	2vph
West- SH73	5vph	2vph

Table 4: Peak Hour Traffic Distribution of Consented Wilfield Traffic and Additional Traffic from Rezoning

Based on standard residential traffic distribution, it has been assessed that 75% of traffic could be exiting the subdivision in the morning peak hour and 65% could be entering the subdivision during the evening peak hour.

9. Traffic Effects

9.1 Local Subdivision Roads

The Selwyn District Plan has guidance on new road standards, based on their position in the road hierarchy. **Figure 10** is the relevant table from the District Plan.

Type of Road	Legal Width (m)		Carriageway Width (m)		Traffic lanes	Parking lanes	Specific provision for cycles (on road or off road)	Pedestrian Provision
	Min	Max	Min	Max	Min. No. of	Min No. Of		Minimum
Local - Major	16	20	8.5	9	2	1	Optional	One side
Local - Intermediate	13	15	7	8	2	1	NA	One side

Figure 10: Selwyn District Plan Table E13.8 Road Standards

Based on the traffic generation that could potentially be served by the subdivision roads with the proposed Plan Change, it is considered that Kingsdowne Drive and Silver Peaks Drive would be 'Local-Major' roads, while other roads within the subdivision would be 'Local-Intermediate' or less.

The carriageway widths that have been constructed in the subdivision (9m Kingsdowne Drive, 9m Silver Peaks Drive, and 8m Ridgeland Way) are consistent with the relevant standards in the table.

An additional 41 houses in the existing Living 2A part of proposed Plan Change area could generate approximately 246vpd and 25vph during peak hours.

It is estimated that, in total, Ridgeland Way could carry up to 336vpd and 34vph during peak hours. These are very low traffic volumes consistent with the 'Local-Intermediate' road classification. NZS4404 Land Development and Subdivision Infrastructure outlines that a suburban local road serving up to 100 households could be as narrow as 5.7m with kerbside car parking permitted within that. This confirms that the existing Ridgeland Way carriageway width will be wide enough for its lower level local road function and to accommodate future traffic volumes if the proposed Plan Change is approved.

The consented Wilfield subdivision could generate approximately 108vph. It has been assessed that about one quarter of those traffic movements could be made on the southern part of Kingsdowne Drive. The additional development will have a slight bias to use the southern Kingsdown Drive access, estimated at about 60% of the generated traffic.

The additional traffic that could be generated by the proposed Plan Change could result in a total traffic volume on the southern part of Kingsdowne Drive up to approximately 53vph, and on the northern part the volume could increase to approximately 98vph. However, this traffic volume would still be consistent with a 'Local-Major' road classification.

The relatively low traffic volumes forecast on Ridgeland Way and Kingsdowne Drive mean the forms of the internal intersection of those two roads and the Kingsdowne Drive intersections on Weedons Ross Road will continue to be appropriate and they will operate safely and efficiently.

9.2 SH73 / Weedons Ross Road Intersection

As reported earlier, the SH73 / Weedons Ross Road intersection is operating with high delays on Weedons Ross Road during peak times. When geometric delay is included with the stopline delay reported earlier, the southern approach to the intersection is operating with a level of service E during the morning peak hour and a LOS F during the evening peak hour. While this is largely related to the volume of through traffic on SH73, the side road volumes do generate a component of the delay through queuing.

A scenario with all 180 consented lots in the Wilfield subdivision developed has been modelled. To do this, an estimate of the current construction traffic was removed from the existing traffic counts and traffic generation for the 125 houses yet to be completed was added. As shown in **Table 5**, the performance of the southern Weedons Ross Road approach would deteriorate, with LOS F forecast during both peak periods. There would be minimal change to the performance of the northern approach compared to the existing situation.

APPROACH	AM PEAK			PM PEAK		
	Existing	With Wilfield	With Plan Change	Existing	With Wilfield	With Plan Change
South-Weedons Ross Road	41s, E	>60s, F	>60s, F	56s, F	>60s, F	>60s, F
North-Weedons Ross Road	20s, C	19s, C	19s, C	38s, E	40s, E	44s, E

Table 5: Existing and Forecast Weedons Ross Road Approach Delays at SH73 Intersection with Existing Through Traffic

Extra traffic volumes generated by the proposed Plan Change would be small, representing approximately an extra 2.3% of peak hour traffic movements at the intersection based on current volumes and a fully developed Wilfield subdivision as consented. Without the proposed Plan Change, the southern approach would already be operating at LOS F during peak hours and any extra traffic on this approach would potentially increase the average delays.

In practice, the 24 AM peak hour vehicle movements forecast from the proposed Plan Change area on the southern approach to the intersection represent one vehicle every two-three minutes. Drivers may choose to travel at a slightly different time to avoid the worst delays at the intersection. The option of travelling to the CSM2 via the Weedons Ross Road interchange may also be an attractive alternative for people travelling to the southern part of Christchurch. As shown in **Table 5**, the additional traffic that could be generated by the proposed Plan Change would have a minimal effect on the average delays on the northern

intersection approach during the peak hours, and as such would not noticeably bring forward the need for improvements.

Even without the proposed Plan Change, the intersection performance will continue to deteriorate as through traffic volumes on the State Highway continue to grow. The intersection has been modelled without the proposed Plan Change traffic generation and with through volumes on SH73 increased by 15%. Based on historical traffic growth rates on SH73, it is estimated this increase represents approximately 5 years' worth of traffic growth.

Approach	AM Peak	PM Peak
South- Weedons Ross Road	>60s, F	>60s, F
North- Weedons Ross Road	25s, D	>60s, F

Table 6: Forecast Weedons Ross Road Approach Delays at SH73 Intersection with Wilfield and 15% State Highway Traffic Growth

As shown in **Table 6**, a 15% increase in through traffic on SH73 would result in significant deterioration to the intersection performance. During the evening peak period, both Weedons Ross Road approaches would be operating with a LOS F.

It is concluded that the intersection performance is already deteriorating as through traffic volumes on SH73 increase. The proposed Plan Change will only result in a small increase in the actual number of vehicles using the intersection. At some point in the near future, the intersection will likely require upgrading. As mentioned previously, NZTA have not publicly identified any plans to make changes at the intersection, and the current intersection safety performance does not show any significant safety problems.

One option that was previously contemplated to alleviate delays was adding a direct access intersection to SH73 from Wilfield which could have significantly reduced the volume of traffic using the Weedons Ross Road intersection. As NZTA did not support an access directly into Wilfield from SH73, subdivision has been carried out with no direct intersection access provision.

The intersection was modelled with traffic signals to confirm that it can operate with acceptable levels of service if upgraded. With 15% growth in SH73 through traffic volumes and the full development of Wilfield, including the increased traffic generation from the proposed Plan Change, the intersection could operate during peak hours with an overall LOS B with a simple two-phase operation or LOS C/D if right turn phases are implemented.

9.3 Wider Road Network

During peak hours, the proposed Plan Change could result in approximately an extra 28vph on SH73 east of West Melton and less traffic on SH73, to the west, and Weedons Ross Road north and south of the subdivision. The extra traffic volumes generated by the proposed Plan Change would be very low compared to both existing and future through volumes on SH73 and Weedons Ross Road. Therefore, the proposed Plan Change would have negligible effects on the wider transport network.

10. Planning Requirements

10.1 Selwyn District Plan

10.1.1 Outline Development Plan

The Outline Development Plan (ODP) for West Melton from Appendix 20 of the Selwyn District Plan is shown below. It shows a dashed outline around the Wilfield and Gainsborough subdivisions, representing the urban limits of the eastern part of West Melton. The proposed Plan Change area is within those limits, covering the portion of the ODP south of SH73.

The proposed Plan Change proposes a replacement ODP, noting that the key existing roads have been broadly based off the existing ODP. As such, the provisions of the existing West Melton ODP do not need to be considered further.



Figure 11: West Melton ODP

10.1.2 Subdivision Rules

Rules 12.1.3.54 to 12.1.3.57 relate to development of the site, with particular reference to the ODP. The key transport elements of the existing ODP have been developed, including

the main and secondary loop roads, and the pedestrian connection across SH73. The replacement ODP will allow the south-eastern corner to be developed with reference to the proposed road and pedestrian connectivity achievable following existing subdivision.

The rule 12.1.3.56 is specifically for the Living 2A Zone portion of the site. It states the maximum number of allotments in the zone is 10. The proposed Plan Change would allow for that to be exceeded through the rezoning of the land. Approximately 51 lots could be developed in the 16-hectare area under such a zoning. The current minimum allotment size of 1ha would also be reduced under a new zoning. From a transport perspective, the primary matter for consideration is the ability of the supporting road network to accommodate additional traffic.

10.1.3 Roading Rules

Any new roads in the Plan Change area will be able to comply with the relevant Roding rules in section 5.1 Road and Engineering Standards. This includes compliance with the new road standards in Appendix E13.3.1. As outlined earlier, the existing section of Ridgeland Way is constructed to an appropriate standard for a 'Local- Intermediate' road and any new roads in the Plan Change area will be able to comply with the standards.

The extension of Ridgeland Way will extend the cul-de-sac well beyond the permitted 150m. That would also be the case with the current zoning. To mitigate that, pedestrian accessways will need to be provided to and across the pylon / ecology corridor, connecting to Silver Peaks Drive, generally at the western and eastern ends of the existing Living 2A area. That is provided for with the detail of the roading network in the replacement ODP. In the future, connections could potentially be made to the west if additional land is developed.

10.1.4 Transport Network Objectives and Policies

Section B2.1 of the District Plan contains objectives and policies related to transport network issues. Relevant policies are listed below in italics and each policy is followed by discussion on the degree to which the proposed Plan Change achieves the policies.

Policy B2.1.2- Manage effects of activities on the safe and efficient operation of the District's existing and planned road network, considering the classification and function of each road in the hierarchy.

Policy B2.1.3- Recognise and protect the primary function of roads classified as State Highways and Arterial Roads to ensure the safe and efficient flow of 'through' traffic en route to its destination.

Policy B2.1.12- Address the impact of new residential or business activities on both the local roads around the site and the District's road network, particularly Arterial Road links with Christchurch City.

These three policies are closely related.

As discussed previously, additional traffic generated by an extra 72 lots would have a negligible effect on the wider road network, including on Weedons Ross Road south of the site and on the State Highway east and west of West Melton.

Nearer the site, the SH73 / Weedons Ross Road intersection is already operating with relatively high delays during peak periods. The performance of the intersection will continue to deteriorate as State Highway traffic volumes increase and it would be desirable for the road controlling authority to modify the layout to address the increasing arterial/ State Highway traffic volumes.

The actual increase in the number of vehicle movements at the intersection from the proposed Plan Change would be small, minimising the cumulative impact of the higher density development. The impact of general traffic growth on SH73 is more significant to the performance of the intersection. In practice, drivers in the local area will tend to spread time of travel at peaks to miss the highest delays at the intersection and the CSM2 could be an attractive travel option to southern parts of Christchurch. Also, the intersection is operating without any significant safety problems currently, despite the delays experienced by drivers.

Within Wilfield subdivision, the existing roads that would provide access to the undeveloped portions of the zone are constructed to an appropriate standard.

Policy B2.1.4(a)- Ensure all sites, allotments or properties have legal access to a legal road which is formed to the standard necessary to meet the needs of the activity considering:

- the number and type of vehicle movements generated by the activity;
- the road classification and function; and
- any pedestrian, cycle, public transport or other access required by the activity

Roads within the proposed Plan Change area will be able to comply with all District Plan design requirements. As outlined, the existing Ridgeland Way and Kingsdowne Drive cross-sections will continue to be appropriate for their standing in the local road hierarchy.

Policy B2.1.10- Ensure vehicle crossings, intersections, pathways, roadside signs and noticeboards are designed and positioned to ensure good visibility for all road users, and to allow safe passage, access and egress

The existing intersections on Weedons Ross Road and Kingsdowne Drive are of appropriate standards to accommodate extra traffic generation associated with the proposed Plan Change. Any intersections within the Plan Change area would be able to be designed during the subdivision planning to ensure that desirable visibility is achieved.

The residential lots would be of large enough sizes that individual vehicle crossings will be able to be positioned to ensure good visibility is available.

Other details of subdivision design will also be considered at a later stage. It is considered safe pedestrian and road networks will be able to be provided in the proposed Plan Change area.

Policy B2.1.11- Ensure roads are designed, constructed, maintained and upgraded to an appropriate standard to carry the volume and types of traffic safely and efficiently

New roads within the Plan Change area will be able to be designed, constructed and maintained to an appropriate standard for a residential development. These details will be confirmed during subdivision design. The extension of Ridgeland Way would likely be

designed to a consistent standard with the existing section of Ridgeland Way, which is appropriate for a 'Local-Intermediate' road.

*Policy B2.1.5- Ensure the development of new roads is:
-integrated with existing and future transport networks and landuses; and
-is designed and located to maximise permeability and accessibility; through achieving a high level of connectivity within and through new developments to encourage use of public and active transport; whilst having regard to the road hierarchy.*

Policy B2.1.13- Minimise the effects of increasing transport demand associated with areas identified for urban growth by promoting efficient and consolidated land use patterns that will reduce the demand for transport

Policy B2.1.14- Encourage people to walk or cycle within and between townships by providing a choice of routes for active transport modes and ensuring there is supporting infrastructure such as parking for cycles, at destinations.

Policy B2.1.15- Require pedestrian and cycle links in new and redeveloped residential or business areas, where such links are likely to provide a safe, attractive and accessible alternative route for pedestrians and cyclists, to surrounding residential areas, business or community facilities.

These four policies are primarily related to pedestrian and cyclist connectivity, and minimising the need for additional roading infrastructure.

There is already good permeability for pedestrians and cyclists throughout the Wilfield subdivision, with footpaths alongside all roads and off-road connections for pedestrians and cyclists providing more direct alternative routes. Around the edge of the subdivision, there are connections to West Melton along Weedons Ross Road and SH73, and across SH73 to Gainsborough.

There will be opportunities for off-road connections, from the undeveloped south-eastern part of the Plan Change area, through reserves, to the northern part of Wilfield.

10.1.5 Growth of Townships Objectives and Policies

Section B4 of the District Plan contains objectives and policies related to the growth of townships. Of particular relevance to this application are the following two policies relating to West Melton:

Policy B4.3.98: Provide a primary focus for new residential or business development north of SH73 and south of Halkett Road, and to allow only a limited extent of new low density residential development south of SH73.

Policy B4.3.99: Promote a consolidated pattern of future urban growth in West Melton

The proposed Plan Change is contrary to B4.3.98 in that the proposed increase in permitted development density is to the south of SH73. The explanation for this policy states new residential growth will be enabled south of the highway but will be limited in extent and density to minimise effects on the safety and efficiency of the highway. As outlined earlier,

the SH73 / Weedons Ross Road intersection is already operating with relatively high delays during peak periods and its performance will continue to deteriorate with State Highway traffic growth. The actual increase in the number of vehicles using the intersection if the proposed Plan Change is approved will be small, compared with existing volumes.

The proposed Plan Change is not considered contrary to B4.3.99 in that the proposed Plan Change area is already zoned for residential development and is within the existing Wilfield subdivision boundaries. The Wilfield subdivision is connected to the remainder of West Melton for pedestrians through footpath connections along Weedons Ross Road, along SH73 and across SH73 to Gainsborough. A number of community facilities, including the domain, are located on the southern side of SH73 and will be easily accessible for Wilfield residents.

10.2 Canterbury Regional Policy Statement

The Canterbury Regional Policy Statement objectives and policies in Chapter 5 Land-Use and Infrastructure and Chapter 6 Recovery and Rebuilding of Greater Christchurch have been reviewed.

The relevant Chapter 5 policies relate to urban growth being attached to existing urban areas, the safety and efficiency of the strategic and arterial road network being maintained, and connectivity for pedestrians and cyclists being provided. Chapter 6 focusses on new residential development occurring in the planned locations, transport effectiveness and integration of land use and infrastructure.

Generally, the policies relating to transport are similar to those in the Selwyn District Plan which have been discussed previously. The proposed Plan Change area comprises the consented Wilfield subdivision, in the existing West Melton urban boundary, and is largely able to utilise existing transport infrastructure. There is good connectivity from the area through the existing Wilfield subdivision and to the remainder of West Melton.

11. Conclusion

The proposed Plan Change would see the existing Living 2 and Living 2A zones in the Wilfield subdivision rezoned to Living West Melton (Living WM) South. This would result in the area being able to potentially accommodate approximately 72 more residential lots.

72 additional residential lots could generate extra traffic volumes of approximately 432 vehicle movements per day and 43 vehicle movements per peak hour. Across the wider traffic network, including on Weedons Ross Road south of the site and on SH73 east and west of West Melton, the additional traffic volumes would have a negligible effect.

Nearer the site, the SH73 / Weedons Ross Road intersection is already operating with some long delays and its performance is forecast to deteriorate further as State Highway traffic volumes continue to grow. It is likely that the intersection will need to be altered in the future but at this stage the intersection has an acceptable safety record and NZTA have not expressed publicly any plans for an upgrade. Regardless, the increase in traffic volumes using the intersection as a result of the proposed Plan Change would be small. In practice, drivers will vary their times of travel to avoid the worst delays at the intersection and the new CSM2 may provide an attractive alternative for travel to southern parts of Christchurch.

Within the Wilfield subdivision, the existing roading infrastructure will continue to be appropriate if the Plan Change is approved. The Kingsdowne Drive intersections on Weedons Ross Road, the Kingsdowne Drive carriageway, the Kingsdown Drive / Ridgeland Way intersection and the Ridgeland Way carriageway are all built to appropriate standards to be able to accommodate the additional traffic that could be generated by the proposed increase in residential density.

The existing Wilfield subdivision has good connectivity for pedestrians and cyclists internally and externally to the West Melton township via Weedons Ross Road and SH73, and across SH73 to Gainsborough. As the undeveloped south-eastern part of the site (currently Living 2A) is to be serviced by a single road, some additional off-road pedestrian connectivity through reserves is included in the ODP.

With the level of development planned and provisions assessed, the Plan Change can be supported from a transportation perspective.

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