TRANSPORTATION ASSESSMENT REPORT

Private Plan Change Request

160 Bangor Road, Darfield

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Executive Summary

Mrs G M Logan proposes a Private Plan Change to the Selwyn District Plan to facilitate residential development on the western edge of Darfield. The Plan Change proposes to remove the deferred status from the Living 2A (deferred) zone on the applicants property.

The primary purpose of the proposed plan change is to facilitate rural residential development.

This transportation assessment report includes a description of the transportation networks in the vicinity of the Plan Change area and provides an assessment of the likely transportation effects of development of the Plan Change area.

The Outline Development Plan (ODP) that accompanies the Plan Change request has been assessed against the transportation related rules of the Selwyn District Plan and it is considered that the proposed road network within the Plan Change area will be fully compliant with those rules.

The analysis of the expected traffic effects associated with the development that would be facilitated by the proposed Plan Change request has also determined that the existing road network has sufficient capacity to accommodate the expected traffic volumes to be generated by the proposed rural residential development. It is therefore considered that the proposed rural residential development that would be facilitated by the proposed Plan Change can be safely and efficiently accommodated within the local transportation environment.

Consequently, there are considered to be no transportation related issues that would prevent approval of the proposed Plan Change.

1. Introduction

Mrs G M Logan proposes a Private Plan Change to the Selwyn District Plan to facilitate rural residential development on the western fringe of Darfield. The proposed Plan Change has a single objective; to remove the deferred status of the Living 2A (deferred) zone on the applicants property.

This transportation assessment report documents and summarises an assessment of the transport related issues associated with the development facilitated by the proposed Plan Change. The assessment undertaken considers the existing transport environment in the area, the expected traffic generation associated with the proposed development and provides an assessment of the potential transport related effects.

2. Existing Transport Infrastructure

2.1 Site Location

The proposed Plan Change site lies on the western fringe of Darfield. The site has frontage to both SH 73 (West Coast Road) and SH 77 (Bangor Road).

The Selwyn District Plan lists both SH 73 and SH 77 as State Highways in the roading hierarchy. The roading hierarchy is therefore taken from the NZTA roading hierarchy. The One Network Road Classification shows SH 73 to be a Regional Road while SH 77 is a Primary Collector. This is a relatively recent classification and the Selwyn District Plan has not been updated to recognise it.

The surrounding road uses are typically rural residential to the west, south and east of the site and rural to the north.

2.2 Site Description

The proposed Plan Change will affect only the applicants property, an area of approximately 130 hectares of flat farmland in two titles. Both titles are zoned L2A def. To the north and west to Clintons Road, the neighbouring land is zoned OP (Outer Plains). To the east across SH 73, the zoning is L2 and L1. Adjoining land between the applicant site and Cridges Road is L2A def and L2 zoned land. To the south across SH 77 land is zoned either L2 or L2A1. The variety of adjoining zones are generally able to be further subdivided.

2.3 Roading Network

The existing roading network of relevance to the site is SH 73 and SH 77. The Road Controlling Authority for both of these roads is the NZ Transport Agency.

SH 73

SH 73 along the frontage of the site is a two lane, two way rural road. The main trunk railway line runs along the northeastern side of the highway. Between the railway and the highway is a water race. These infrastructures combined require a reserve of about 60 metres separating the property boundaries on each side. None of the properties on the northeastern side have direct access to the highway.

Traffic lanes are typically 3.5 metres wide with 0.5 metre wide sealed shoulders.

The road is flat and straight with excellent visibility in both directions anywhere along the frontage of the applicants site.

The speed limit past the applicants site is 100 km/hr. South of Cridges Road, the speed limit reduces to 50 km/hr and continues south through the Darfield township.

SH 77

SH 77 (Bangor Road) is also a two lane, two way road. The road is straight and flat with excellent visibility from any point along the applicants frontage.

Traffic lanes are consistently about 3.75 metres wide with minimal sealed shoulders.

A separate footpath has been constructed on the southern side only of Bangor Road east of Oakden Drive to the Darfield township.

The speed limit on Bangor Road is 50 km/hr from just west of McLaughlins Road east to Darfield. The speed limit increases to 80 km/hr from the end of the 50 km/hr limit to 200 metres west of Piako Drive and is 100 km/hr west of this speed limit change. This places most of the applicants site and all of the secondary school frontage in the 80 km/hr section.

Bangor Road is controlled by a "Stop" control at the SH 73 intersection. The intersection is well developed with right turn bays and a left turn slip lane on SH 73 to facilitate safe turning to and from SH 73.

2.4 Public Transport

Redbus runs a weekday commuter service between Darfield and Christchurch but this does not appear to be an ECAN subsidised service. A number of school bus routes operate servicing the schools in Darfield.

The TranzAlpine rail service operates daily between Greymouth and Christchurch and has a stop in Darfield. However, this is a tourist service and is not considered important as public transport for Darfield.

Atomic Shuttles operates a small, long distance bus service between Christchurch and Greymouth.

2.5 Footpaths and cycle routes

There are no cycle routes on SH 73 or SH 77.

There is only a single footpath constructed on SH 77 between Oakden Drive and SH 73.

However, there are off road walking and cycling recreational facilities and the Darfield Domain on the northeastern side of SH 73.

3. Travel Patterns

3.1 Traffic Volumes

NZTA publish their traffic counting results and there are 3 traffic counting sites of relevance to Darfield. These are:

- SH 73 between Russell St and Clinton Rd
- SH 73 between SH 77 and Route 72
- SH 77 Virtual west of SH 73.

Results of the AADT surveys are shown in table 1 below.

Year	SH 73 (Russell to Clinton)	SH 73 (SH 77-Route 72)	SH 77 (west of SH 73)
2004	3877 vpd	1663 vpd	1476 vpd
2005	4010	1780	1306
2006	4524	2017	1722
2007	4356	1772	2056
2008	4108	1805	2074
2009	4187	1784	2194
2010	4578	1835	2441
2011	4942	2073	2622
2012	5071	2589	2504
2013	4967	3041	2391
Annual Growth rate	2.4%	3.7%	5.6%
2015 estimate	5250 vpd	2765 vpd	2960 vpd

Table 1: SH 73 and SH 77 traffic volumes

This table is shown graphically in section 6.

Using the traffic volumes from table 1, an estimate of the turning movements through the SH 73/77 intersection has been made. For the purposes of this analysis, it has been assumed that the two way flows are split equally and that the traffic volume between Russell and Clinton reduces by 600 vpd in each direction due to the commercial developments between the count station and the SH 73/77 intersection generating 1200 vpd from the east which would not use the intersection. It has been assumed that 75% of the traffic from Bangor Road would be either commuter traffic heading towards Christchurch or accessing the commercial centre of Darfield.

The assumed daily traffic volumes through the SH 73/77 intersection are shown below in figure 1.

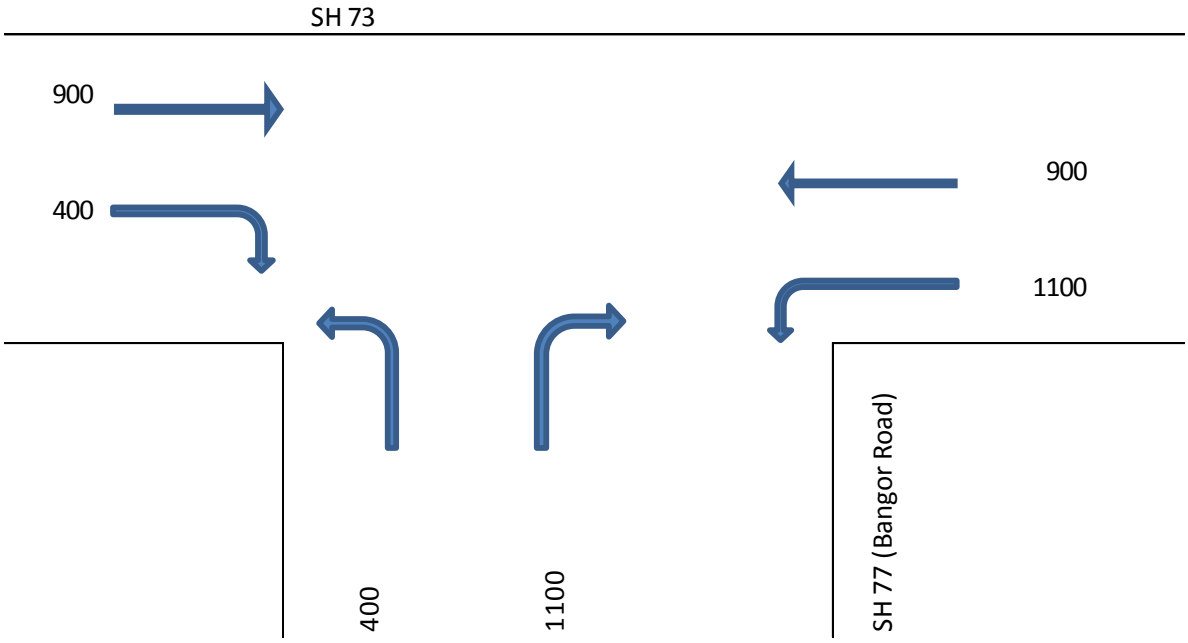


Figure 1: SH 73/77 intersection assumed daily turning volumes – existing 2015.

Assuming that 15% of the traffic through this intersection occurs in the AM peak hour, the turning movements are shown in figure 2 below. It is considered that 15% is a high estimate for an area such as this with a commercial focus but is a conservative estimate.

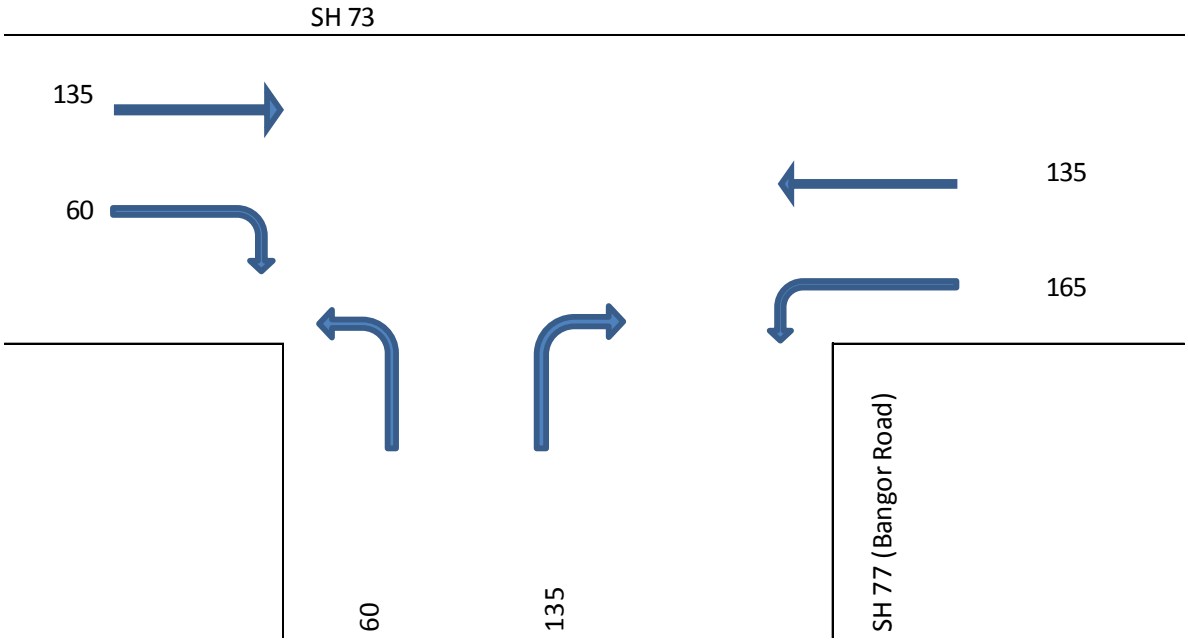


Figure 2: SH 73/77 intersection assumed peak hour turning volumes – existing 2015

3.2 Public Transport

There are no scheduled ECAN public transport services in Darfield. However Redbus operates a weekday commuter service leaving the Darfield railway station at 7.15am and returning to Darfield at 6.00pm. A number of school bus routes also operate servicing the schools in Darfield.

Local shuttle services are run by Atomic Shuttles between Greymouth and Christchurch daily. There is a stop in Darfield but this is not considered to be public transport in the traditional sense.

Tranzrail run the TranzAlpine rail service between Greymouth and Christchurch. This service also has a stop in Darfield but cannot be considered public transport.

3.3 Cyclists and Pedestrians

No formal surveys have been undertaken of the extent of walking and cycling activity in the area however informal observations during site visits and local knowledge indicate the level of walking and cycling activity to be low. This is even though there is a secondary school on Bangor Road.

3.4 Parking

No formal parking is provided along either SH 73 or SH 77. No parking demand was observed along the frontage of the applicants property on either road as expected in a rural or rural residential area.

It was noted from the undated aerial photo in Canterbury Maps that there is informal and unpredictable parking demand on SH 73 at the Darfield Domain. 14 vehicles were parked on the side of the road and the state of the ground seen on the aerial photo suggested this may be a common activity.

4. Road Safety

A search of the 2010-2014 NZTA crash database was undertaken for the sections of SH 73 between Horndon Street and SH 77 and on SH 77 between SH 73 and 100 m east of Clintons Road. The search included the SH 73/77 intersection. The results of the search are included in appendix 1.

There were no crashes reported on SH 73.

There was a single crash at the intersection of SH 73/77. The crash in 2013 was caused by a truck turning right from SH 77 onto SH 73 colliding with a southbound car. The result of the crash was a minor injury.

There were 3 crashes on SH 77.

One crash was due to a drunk driver losing control on a wet road at night and resulted in no injury.

The second crash involved a pedestrian walking along the road being struck from behind on a dry dark road. This crash resulted in a minor injury.

The third crash involved a vehicle losing control on an icy road and resulted in a minor injury.

All 3 of the SH 77 crashes were caused by westbound vehicles and none of the crashes occurred on the applicants road frontage.

The low number of crashes and the type of crashes within the vicinity of the applicants site indicates that there are no underlying safety concerns with the local road network.

5. Existing Levels of Service

5.1 Intersection Capacity

The SH 73/77 intersection has assumed hourly traffic counts as shown in figure 1. The main road traffic volumes in the peak hour are 495 vph including turning movements and the minor road traffic volumes are 195 vph.

AUSTROADS Part 5 "Intersections at Grade", 2005 states *"Table 4.1 indicates the maximum traffic volume combinations for uninterrupted flow conditions. It is unnecessary to flare intersection approaches or carry out an intersection analysis when the combinations of major road and minor road volumes are less than those in the Table."* In this case, the peak hour volumes are within those limits and should not require an intersection analysis. However, addition of the development traffic will exceed those limits so an analysis has been carried out regardless to make the comparisons meaningful.

5.2 Road Capacity

Using the methods described in the Economic Evaluation Manual, Part 1, section A3.11, the capacity for SH 73 and SH 77 were calculated. Both of the roads have a capacity in excess of 2,000 vph. The existing traffic volumes on both roads are well below these capacities.

5.3 Public Transport

As described previously, there is little in Darfield that can be considered to be traditional public transport other than the single peak hour Redbus service to Christchurch. Therefore, the existing public transport level of service is considered to be low.

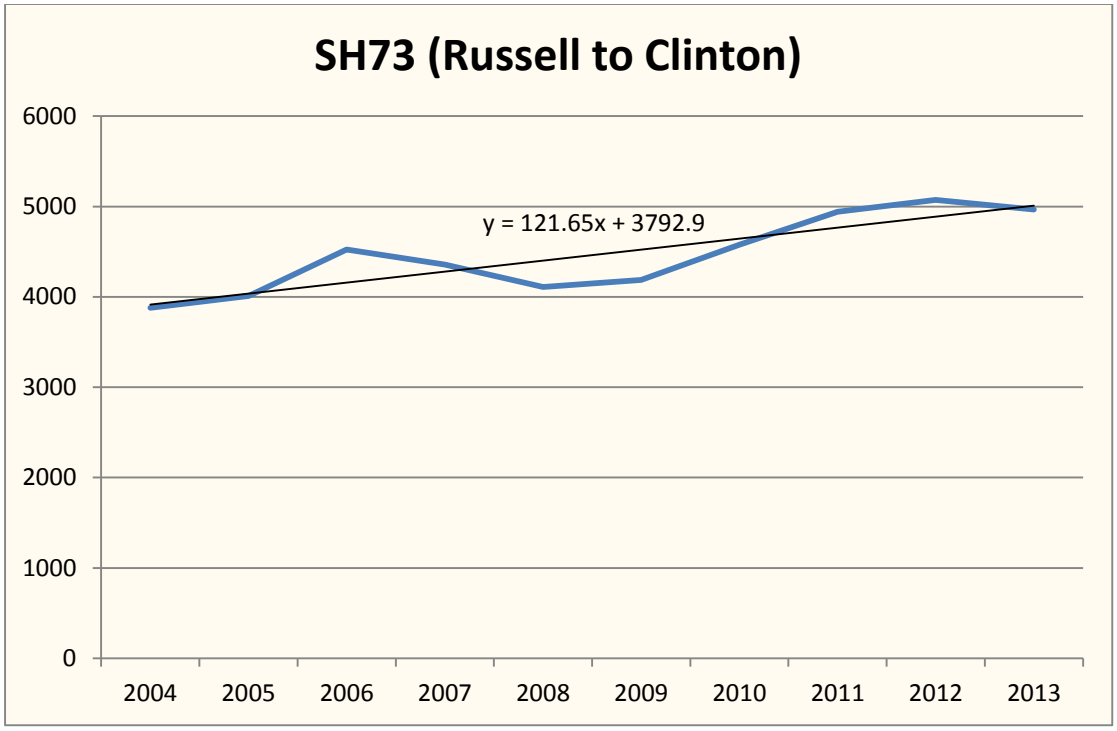
5.4 Walking and Cycling

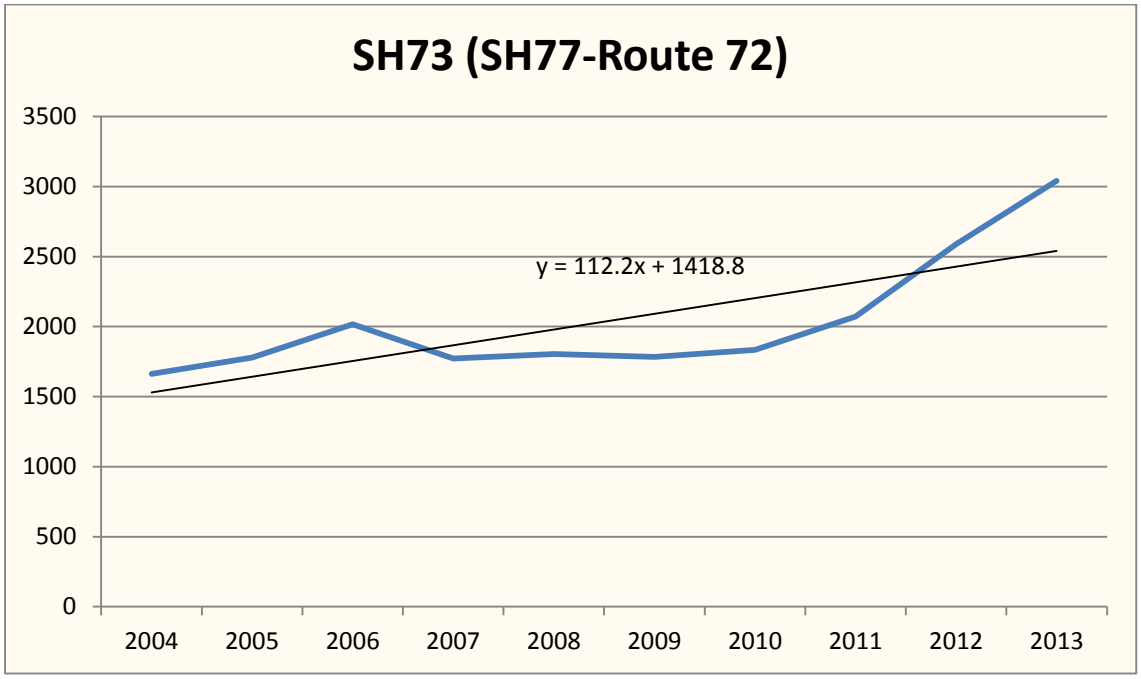
While no formal surveys have been undertaken of the extent of walking and cycling in the area, informal observations and local knowledge suggest that the activity levels are low.

Note that one of the crashes on SH 77 involved a pedestrian walking along the road. Given that this crash occurred, there is a secondary school nearby and there are many rural residential properties with potential for further development, it is considered that the current level of pedestrian provision is inadequate and more footpaths should be provided.

6. Traffic Growth

The traffic counts shown in section 3.1, Table 1 are presented below in graphical form.





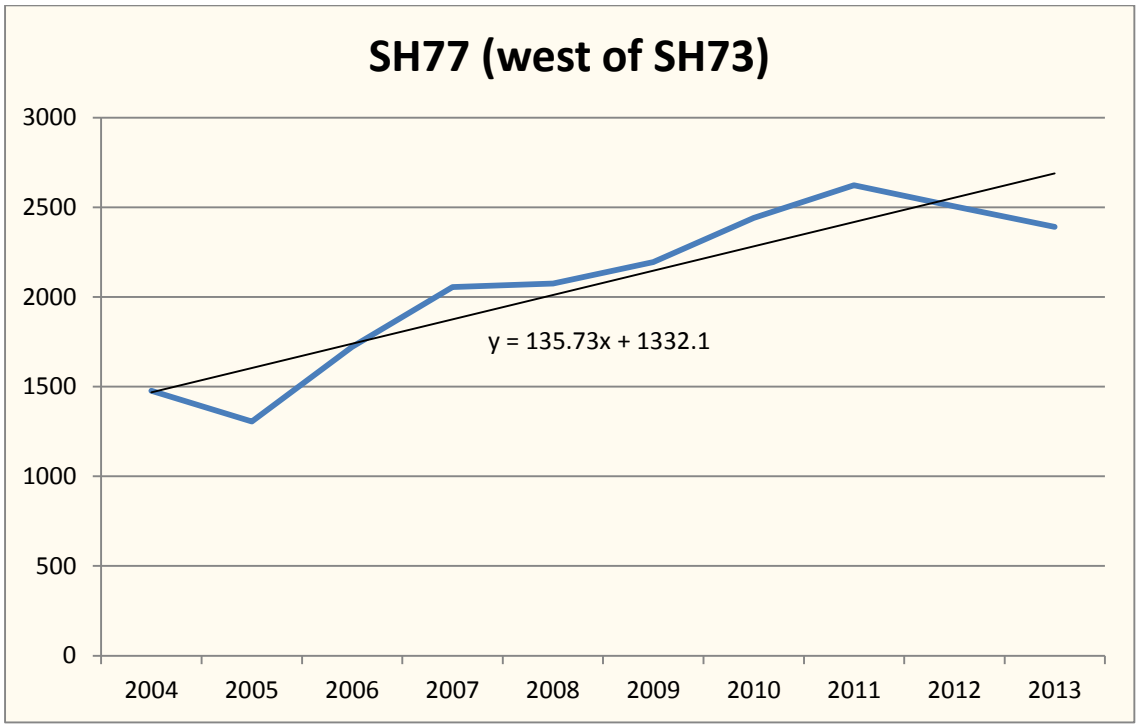


Figure 3: Graphs of traffic counts and traffic growth

These graphs show the general growth trend for the last 10 years. This includes the last 3 years since the earthquakes. Since the earthquakes, the general trend for growth has continued. The growth rates vary between 2.4 and 5.6% per year. The highest growth rate is on SH 77 which has seen residential development in recent years from a low initial traffic volume. This is not unexpected. However, the growth rates have been much higher than the general national trend for stagnant or negative traffic growth suggesting that the growth rates may not be sustainable long term. Short term growth can be expected from recent industrial developments such as the Fonterra processing plant in Darfield and residential development.

Known developments are unlikely to add significant growth along SH 77 where the majority of the traffic generated by the proposed development will occur.

Note that the two latest traffic counts on SH 77 have shown consistent falls in traffic volumes.

7. Proposed Plan Change

7.1 Description

The proposed plan change includes two separate rural titles, both with frontage to SH 77 and one also has frontage to SH 73. Both are zoned L2A Deferred. The area of the two titles combined is approximately 130 hectares.

It is proposed that the deferral be lifted to allow the development of the site.

The L2A zone allows for development with an average of 1 hectare sites. After an allowance is made for roading, stormwater disposal basins (if required), etc it is estimated that about 125 hectares will be available for development into the residential sections. This will allow 125 residential sections to be developed. The actual number of sections will not be known until subdivision stage with a detailed proposal and engineering design but cannot exceed 130. For the purposes of this analysis, a total of 125 sites has been assumed which is considered a realistic number.

7.2 Access

The Outline Development Plan (ODP) for the plan change area shows the new roads proposed for property access within the plan change area. There will be three access points to the area from the existing State Highway network. One access will be from SH 73 for cyclists and pedestrians only and two from SH 77 for cyclists, pedestrians and all other traffic.

Primary traffic access to the development will be from SH 77. The pedestrian and cyclist access to SH 73 has been proposed to provide an alternative access from the development to give more direct access to the walking and cycling tracks west of Darfield.

Those properties fronting SH 77 will have direct access to SH 77. This will increase the density of accesses along the section and will enable NZTA to reduce the speed limit to 70 km/hr if they desire. The western development access on SH 77 will be a “Tee” intersection and the eastern SH 77 access will form a cross roads with Piako Drive.

All of the internal roads will carry little traffic and will only be classified as local roads with their primary function being property access.

8. District Plan Provisions

While the Selwyn District Plan provides detailed rules relating to transportation matters, it is not considered appropriate to provide an assessment of the proposed Plan Change against all of these rules because the ODP is not intended to provide detail sufficient for a robust analysis. The development concept could change when the land is further subdivided. A summary of the more relevant transport rules for this stage of development is outlined in the following table:

Rule	Requirement	Provided	Compliance
13.1	General on site parking requirements for developed sites. Two spaces required on site for each residential unit.	NA	2 parking spaces can be provided for rural residential sites on site.
13.2.1	Private vehicle access requirements	NA	These can be assessed at subdivision stage
13.2.2	Distance of Vehicle Crossings from Intersections. No part of any vehicle crossing shall be located closer to the intersection of any roads than the minimum distances specified in Table E13.5 (must be more than 100m from the intersection)	NA	Relevant to the local road intersections with SH 77. No access proposed on SH 73. Assessed at building consent stage.
13.2.3	Sight distance from vehicle crossings. Any access to a State Highway shall have a minimum sight distance of 203m for an 80 km/hr speed limit	>203m	Yes
13.2.4	Vehicle crossing design and siting	NA	Assessed at building consent stage
13.3	Road standards. Any new road shall be laid out and vested in the Council in accordance with the standards contained in Table E13.8. Local Roads-Living 2 zone only. Minimum legal width=18m Maximum reserve width=20m Carriageway width 6-6.5m Two traffic lanes No parking lanes No specific cycle provision Optional pedestrian provision but no more than one side No kerb and channel	Reserve width of 18-20 m	Yes
13.3.2	Road Intersection Spacing Spacing between road intersections shall comply with Table E13.10 (or correctly E13.9)	Min 150	See speed limit discussion below

Table 2: Selwyn District plan requirements

Speed Limit

The speed limit for the internal roads has not yet been determined. However, the roads will be developed to a rural residential standard which typically has a density of development suitable for only a 70 km/hr speed limit. The Speed Limit Rule describes a 70 km/hr speed limit as "*a speed limit of 70 km/h is appropriate in areas of intermediate roadside development, such as small country towns, urban fringe areas, short sections of road in partly built-up areas within a large urban traffic area or areas of single-sided development.*"

Although the speed limit for the roads is likely to be 70 km/hr, it is intended that the design speed for the roads and hence the speed environment will be no more than 50 km/hr. Since the lowest speed limit signs that could be legally erected are 70 km/hr signs, it is considered that no speed limit signs should be erected and rely on the design of the roads to ensure the speed environment is kept low.

Hence, the road spacing should comply with the distance for a speed limit of 50 km/hr. Table E13.9 from the District Plan requires a spacing of 123m for a speed limit of 50 km/hr.

9. Traffic Generation and Distribution

9.1 Expected Traffic Generation

A recent Plan Change application to Selwyn District Council considered the traffic generation for households within the L2 zone in Darfield. This was the Silver Stream Estates Ltd application in September 2010. The Transportation Assessment Report for this Plan Change recommended that a traffic generation rate of 6 vehicles per day (vpd) per household should be used for their application. This appears to have been accepted by Council as correct.

A recent study by Avanzar Consulting of a mature rural residential development in Waimakariri District assessed the traffic generation of each site as 6.9 vpd per household. Similarly, an urban residential traffic generation was assessed using an urban area in Palmerston North City and the traffic generation for urban sites is 6.2 vpd. These will be published in the next version of the Trips Database which is a nationally recognised source of traffic generation rates. An average traffic generation of 6.5 vpd per household will be used since the development is on the urban fringe and some of the destinations (ie secondary school) for residents are within walking distance.

Similarly, the average AM peak hour traffic generation will be 0.57 vehicles per hour per dwelling based on the Avanzar Consulting surveys to be entered into the Trips Database.

Note that the AM peak hour has been chosen since this is when most traffic will be exiting the development and turning right from SH 77 onto SH 73. This has a much greater effect on the operation of the intersection than the PM peak hour which has the dominant movement from the development turning left from SH 73 into SH 77.

9.2 Traffic distribution

Based on 125 sites, the development will generate 813 vehicles per day and 71 vehicles in the morning peak hour.

Although it has not been decided at this stage how many of the 3,000 m^2 sites will have direct access to SH 77, at least half of them will front SH 77 and can have direct access. This is a minimum of 22 sites. The remainder of the development will have access to the internal roads.

It is estimated that 70 sites will use the Piako Drive intersection while 33 sites will use the western access on SH 77. Hence, 455 vpd will use the Piako Drive access and 214 vpd will use the western access on SH 77. The additional traffic on SH 77 due to the development will be 812 vpd.

Using similar distribution for the AM peak hour, 40 vph will use the Piako Drive access and 19 vph will use the western access on SH 77.

It is expected that the development could take up to 10 years to be completed. Therefore, the effect of the development on the traffic distribution in 10 years time needs to be considered. The base data for the future year 2025 has been assessed below by applying the traffic growth rates on the approaches as described in section 3.1.

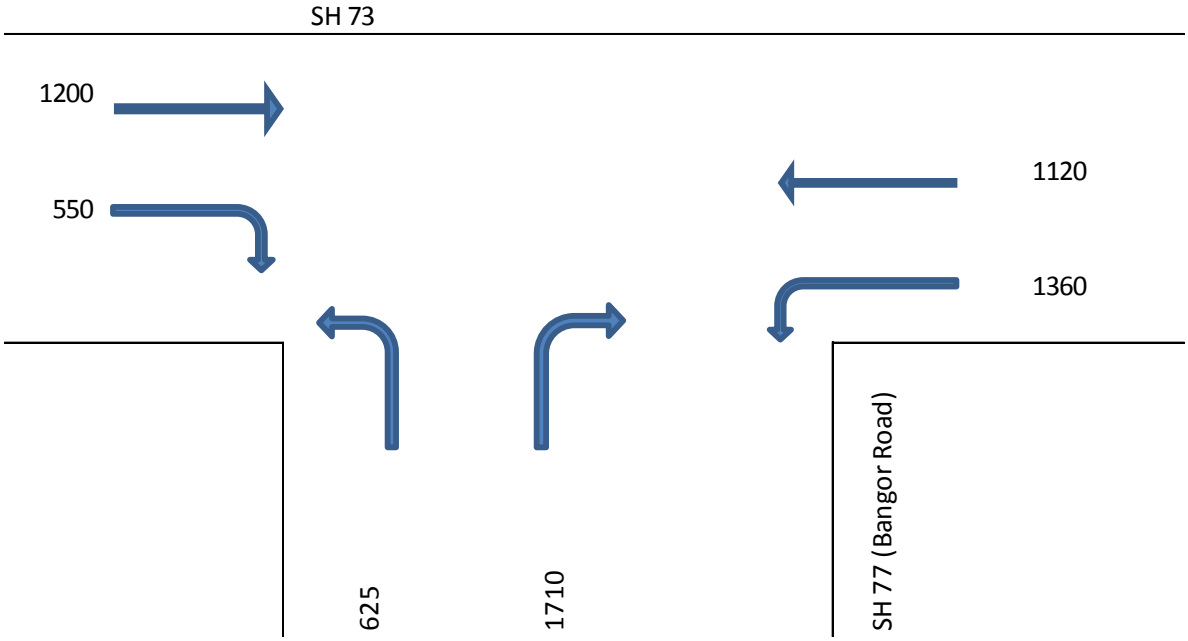


Figure 4: SH 73/77 Assumed daily traffic volumes in 2025 – no development

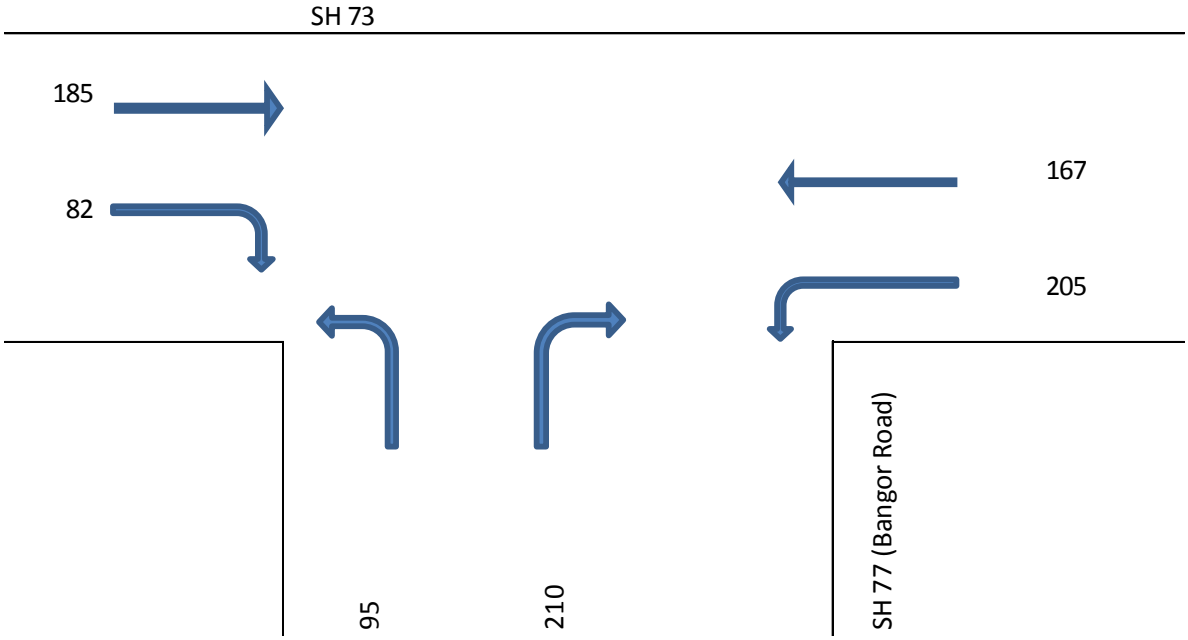


Figure 5: SH 73/77 Assumed AM peak traffic volumes in 2025 – no development

The effect of this traffic distribution on the SH 73/77 intersection in the year 2025 is estimated in the figures below. These assume that traffic is split evenly through the day but the AM peak hour traffic is all in one direction leaving the development and entering the intersection. This is a conservative assumption.

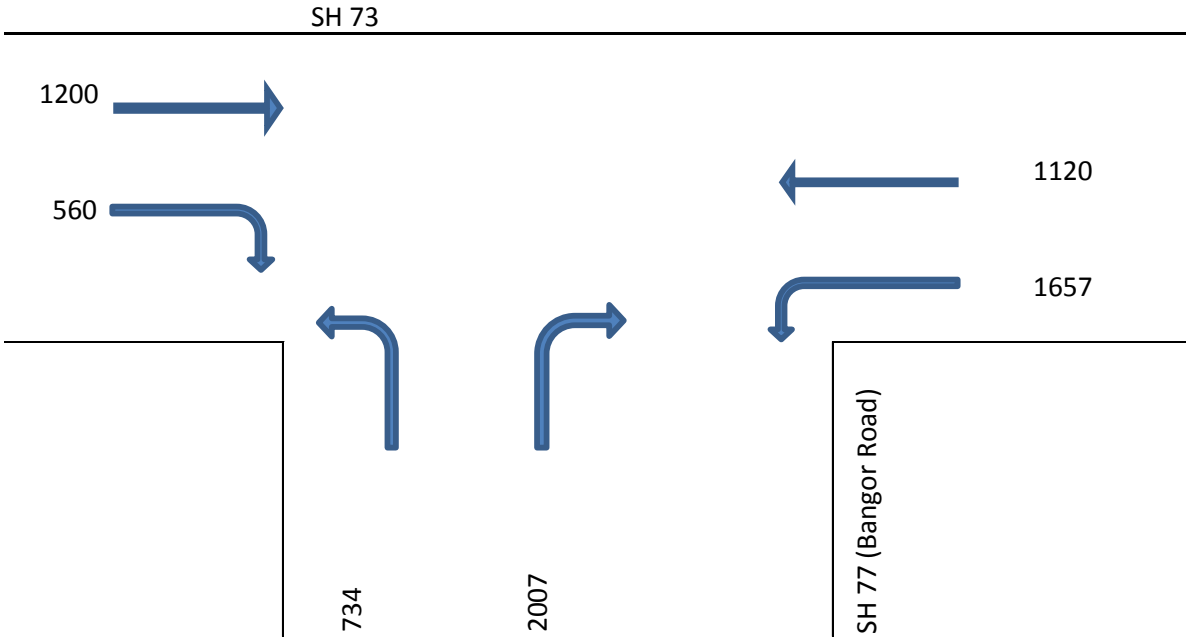


Figure 6: SH 73/77 assumed daily traffic volumes in 2025 with development added

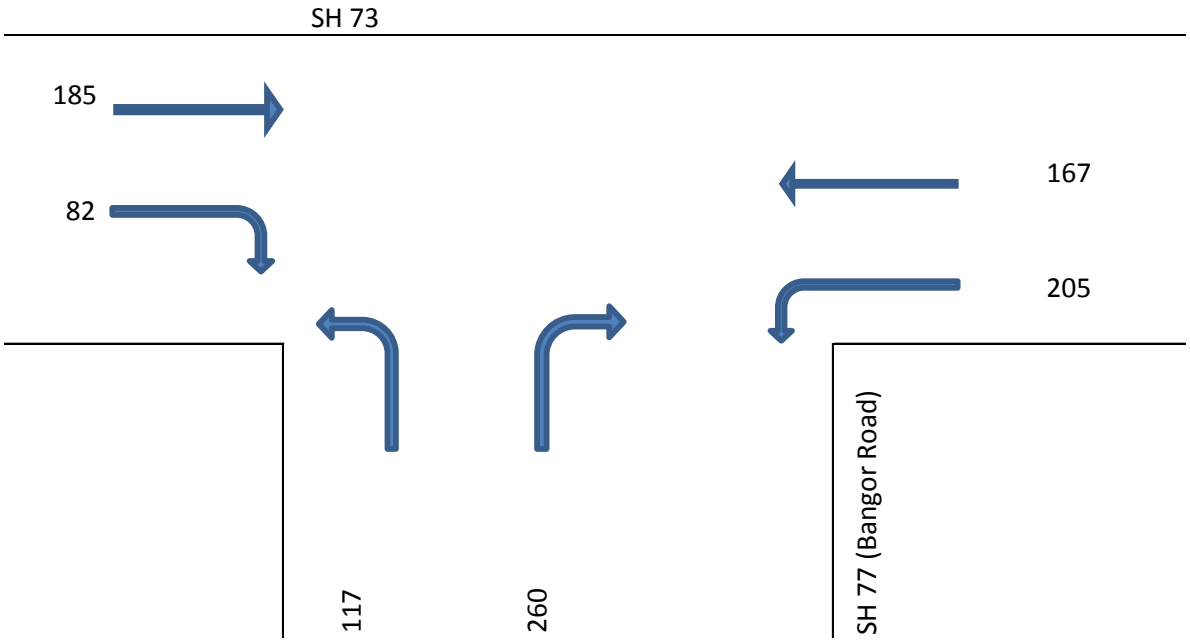


Figure 7: SH 73/77 assumed AM Peak traffic volumes in 2025 with development added

10. Effects on the Transport Network

10.1 SH 73/77 Intersection

The expected traffic volumes using the SH 73/77 intersection in 2025 in both the existing developed area with historic traffic growth rates added and with the proposed development added to those have been analysed using SIDRA Intersection Analysis software. The AM Peak was analysed since it is considered that this will be the peak period when the effect of the proposed development will have the greatest effect due to the demand for the right turn from SH 77 onto SH 73. The results of the analysis are presented in tables 3 and 4 below.

Approach	Traffic Volume (veh/hr)	Average delay (secs)	Level of Service	95% Back of Queue (vehicles)
SH 73 (South)	392	2.5	A	0
SH 73 (North)	281	1.7	A	0.3
SH 77 (Bangor Rd)	321	17.3	C	3.6

Table 3: Expected performance of SH 73/77 intersection in 2025 with no development

Approach	Traffic Volume (veh/hr)	Average delay (secs)	Level of Service	95% Back of Queue (vehicles)
SH 73 (South)	392	2.5	A	0
SH 73 (North)	281	1.6	A	0.3
SH 77 (Bangor Rd)	397	20.0	C	5.5

Table 4: Expected performance of SH 73/77 intersection in 2025 with Bangor Road development

It is clear that the intersection will operate within its capacity both with and without the proposed Bangor Road development.

Visibility on all approaches to the intersection is good. The intersection is currently well developed with auxiliary lanes on the SH 73 approaches. No upgrading is considered necessary to accommodate the new traffic generated from the proposed development.

10.2 Development Road/SH 77 Intersections and SH 77

Two road links to SH 77 are proposed; the main link at Piako Drive and a second link some 400 metres to the west.

The main link will form a cross roads with Piako Drive. Piako Drive is a short cul-de-sac with some 27 houses developed along it. The main link road from the proposed development is likely to be used by about 70 households. AUSTROADS Part 5:2005 Table 4.1 shows that the intersection capacity for uninterrupted flow with a 2025 assumed volume on SH 77 of 300 vph in the AM peak is more than 250 vph from the side roads. The side roads (Piako Drive and the development road) will generate about 55 vehicles in the peak hour. This is well below the capacity of the intersection and therefore no modelling is considered necessary. Together with the good visibility along the straight, flat road,

the intersection is expected to operate safely and efficiently. It is too early to discuss construction details but a good design to appropriate current standards would be proposed for the intersection at subdivision consent stage.

The second link on SH 77 will provide a lesser used secondary access to the development. It is likely to be a Tee intersection and will have AM peak traffic volumes. The side road will generate about 20 vph in the peak hour and will again have a capacity of more than 250 vph. Again, no traffic modelling is considered necessary. Again, the visibility is good and the intersection will operate in a safe and efficient manner.

It is proposed to allow direct access from SH 77 to all of the smaller 3,000 m^2 properties fronting SH 77 except where they are close to intersections and access would then be from the side road. The current speed limit along the frontage is 80 km/hr. However, the level of development already undertaken on SH 77 suggests that a speed limit of 70 km/hr is probably appropriate currently. The new links and frontage access to SH 77 to be constructed for the proposed development will add to the density of access making the 70 km/hr speed limit more desirable and successful. Most drivers are likely to accept this 70 km/hr speed limit with appropriate levels of frontage development. Because the accesses to the proposed development will still be relatively widely spaced typical of a rural residential setting, it is unlikely that a speed limit lower than 70 km/hr could be justified. Considering the zoning allows potential further development of the land fronting SH 77 on both sides as far as Clintons Road, ensuring that sufficient property access is provided on all of these properties will ensure that a self-enforcing speed limit can be imposed consistent with the speed environment created by sympathetic development.

10.3 Internal Roading Network

The ODP shows the main roading network that will service the proposed development. Other minor roads will be required to gain access to individual properties. All of the roads shown have low traffic volumes with the highest traffic volume (456 vpd) expected on the link opposite Piako Drive. This is a low volume and all roads within the proposed development will be minor local roads. The road reserve widths will be between 18 and 20 metres to accommodate the necessary infrastructure, particularly drainage infrastructure. Sealed carriageways will be between 6.0 and 6.5 metres wide.

The design speed of the curves and road links is intended to be kept low and no more than 50 km/hr.

Limited use of footpaths is intended with pedestrians generally walking on the road or the unsealed shoulder. The low speed environment will ensure this activity can be carried out safely. There will be no specific cyclist infrastructure. NZS4404:2010 “Land Development and Subdivision Infrastructure” suggests that these users are most appropriately accommodated without specific separate infrastructure.

Streetlighting will be kept to a minimum to retain the rural environment with as little light pollution as possible.

11. Conclusions

This Transportation Assessment has considered the potential transportation impacts of the proposed Plan Change request for 160 Bangor Road.

A review of the crash records for the adjoining State Highway network suggests there are no identifiable safety issues with the surrounding road network.

Analysis of the expected traffic effects associated with the development has determined that the existing road network has sufficient capacity to safely and efficiently accommodate the expected traffic volumes generated by the development.

The ODP accompanying the Plan Change request has been assessed against the transportation related rules of the Selwyn District Plan and it is considered the proposed network can be fully compliant.

There are considered to be no transportation related issues that would prevent approval of the proposed Plan Change.

Appendix 1

Crash data

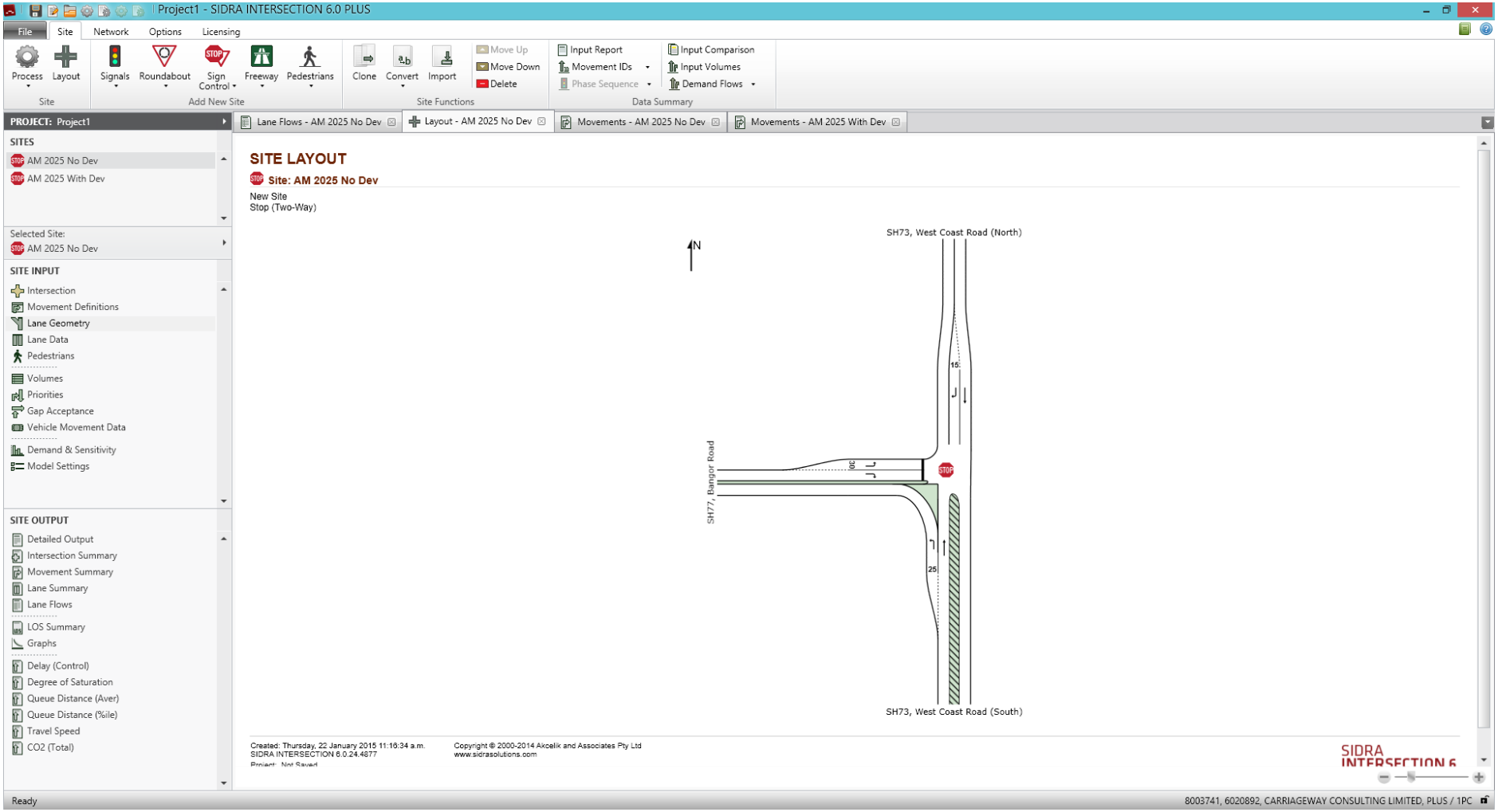
Appendix 2

Traffic Counts

Region	SH	RS	RP	Site Ref	Description	Direction	Equipment	AADT (2009)	AADT (2010)	AADT (2011)	AADT (2012)	AADT (2013)
11	73	41	2	ID:07300043	Darfield - West of SH 77 Junction and East of Route 72 Junction	Both	Single Loop	1784	1835	2073	2589	3041
11	73	52	12.5	ID:07300064	SPRINGFIELD - Telemetry Site 11 - West of Township	Both	Telemetry	1684	1659	1567	1563	1609
11	77	79	14.89	ID:07700094	Virtual - West of SH 73 Junction	Both	Virtual	2194	2441	2622	2504	2391

Appendix 3

SIDRA Results


Project1 - SIDRA INTERSECTION 6.0 PLUS
File
Site
Network
Options
Licensing
Process
Layout
Signals
Roundabout
Sign Control
Freeway
Pedestrians
Clone
Convert
Import
Move Up
Move Down
Delete
Input Report
Movement IDs
Phase Sequence
Input Comparison
Input Volumes
Demand Flows
Site
Add New Site
Site Functions
Data Summary
PROJECT: Project1
SITES
AM 2025 No Dev
AM 2025 With Dev
Selected Site:
AM 2025 No Dev
SITE INPUT
Intersection
Movement Definitions
Lane Geometry
Lane Data
Pedestrians
Volumes
Priorities
Gap Acceptance
Vehicle Movement Data
Demand & Sensitivity
Model Settings
SITE OUTPUT
Detailed Output
Intersection Summary
Movement Summary
Lane Summary
Lane Flows
LOS Summary
Graphs
Delay (Control)
Degree of Saturation
Queue Distance (Aver)
Queue Distance (%ile)
Travel Speed
CO2 (Total)
Lane Flows - AM 2025 No Dev
Layout - AM 2025 No Dev
Movements - AM 2025 No Dev
Movements - AM 2025 With Dev
SITE LAYOUT
Site: AM 2025 No Dev
New Site
Stop (Two-Way)
N
SH73, West Coast Road (North)
SH77, Bangor Road
SH73, West Coast Road (South)
Created: Thursday, 22 January 2015 11:16:34 a.m.
SIDRA INTERSECTION 6.0.24.4877
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SIDRA INTERSECTION 6
Ready
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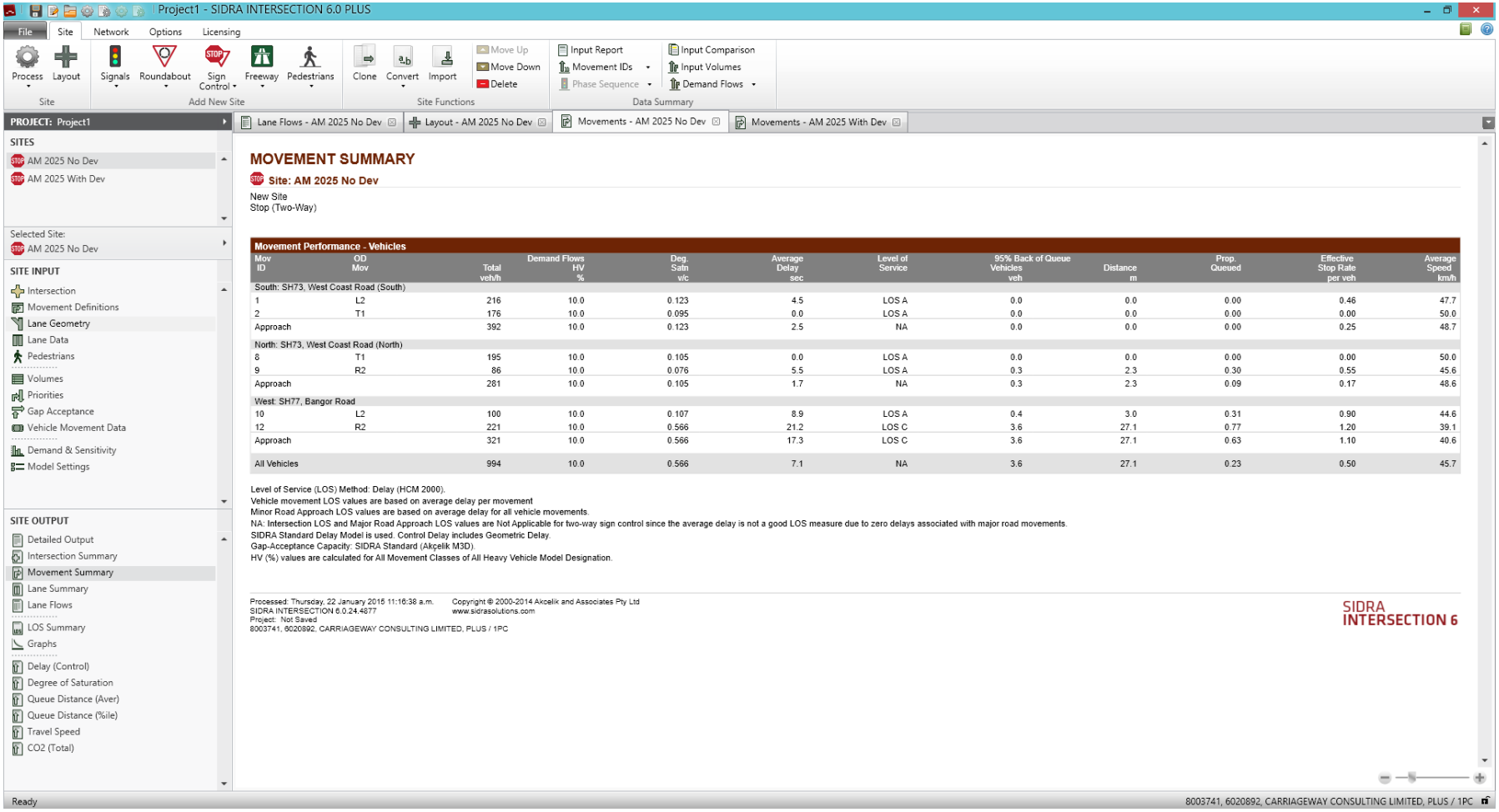
Project1 - SIDRA INTERSECTION 6.0 PLUS
File
Site
Network
Options
Licensing
Process
Layout
Signals
Roundabout
Sign Control
Freeway
Pedestrians
Clone
Convert
Import
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Move Down
Delete
Input Report
Movement IDs
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Input Comparison
Input Volumes
Demand Flows
Site
Add New Site
Site Functions
Data Summary
PROJECT: Project1
SITES
AM 2025 No Dev
AM 2025 With Dev
Selected Site:
AM 2025 No Dev
SITE INPUT
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Movement Definitions
Lane Geometry
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Pedestrians
Volumes
Priorities
Gap Acceptance
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Graphs
Delay (Control)
Degree of Saturation
Queue Distance (Aver)
Queue Distance (%ile)
Travel Speed
CO2 (Total)
Lane Flows - AM 2025 No Dev
Layout - AM 2025 No Dev
Movements - AM 2025 No Dev
Movements - AM 2025 With Dev
MOVEMENT SUMMARY
Site: AM 2025 No Dev
New Site
Stop (Two-Way)
Movement Performance - Vehicles
Mov ID
OD Mov
Demand Flows Total veh/h
Demand Flows HV %
Deg. Satn v/c
Average Delay sec
Level of Service
95% Back of Queue Vehicles veh
Distance m
Prop. Queued
Effective Stop Rate per veh
Average Speed km/h
South: SH73, West Coast Road (South)
1 L2 216 10.0 0.123 4.5 LOS A 0.0 0.0 0.00 0.46 47.7
2 T1 176 10.0 0.095 0.0 LOS A 0.0 0.0 0.00 0.00 50.0
Approach 392 10.0 0.123 2.5 NA 0.0 0.0 0.00 0.25 48.7
North: SH73, West Coast Road (North)
8 T1 195 10.0 0.105 0.0 LOS A 0.0 0.0 0.00 0.00 50.0
9 R2 86 10.0 0.076 5.5 LOS A 0.3 2.3 0.30 0.55 45.6
Approach 281 10.0 0.105 1.7 NA 0.3 2.3 0.09 0.17 48.6
West: SH77, Bangor Road
10 L2 100 10.0 0.107 8.9 LOS A 0.4 3.0 0.31 0.90 44.6
12 R2 221 10.0 0.566 21.2 LOS C 3.6 27.1 0.77 1.20 39.1
Approach 321 10.0 0.566 17.3 LOS C 3.6 27.1 0.63 1.10 40.6
All Vehicles 994 10.0 0.566 7.1 NA 3.6 27.1 0.23 0.50 45.7
Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Processed: Thursday, 22 January 2015 11:16:38 a.m.
SIDRA INTERSECTION 6.0.24.4877
Project: Not Saved
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MOVEMENT SUMMARY

Site: AM 2025 With Dev

New Site
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: SH73, West Coast Road (South)											
1	L2	216	10.0	0.123	4.5	LOS A	0.0	0.0	0.00	0.46	47.7
2	T1	176	10.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		392	10.0	0.123	2.5	NA	0.0	0.0	0.00	0.25	48.7
North: SH73, West Coast Road (North)											
8	T1	195	10.0	0.105	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
9	R2	86	10.0	0.060	5.3	LOS A	0.3	2.1	0.30	0.53	45.6
Approach		281	10.0	0.105	1.6	NA	0.3	2.1	0.09	0.16	48.6
West: SH77, Bangor Road											
10	L2	123	10.0	0.132	8.9	LOS A	0.5	3.8	0.32	0.90	44.6
12	R2	274	10.0	0.701	25.0	LOS D	5.5	42.2	0.83	1.34	37.6
Approach		397	10.0	0.701	20.0	LOS C	5.5	42.2	0.67	1.20	39.5
All Vehicles		1069	10.0	0.701	8.8	NA	5.5	42.2	0.27	0.58	44.8

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: CARRIAGEWAY CONSULTING LIMITED | Processed: Thursday, 11 June 2015 4:08:11 p.m.
Project: C:\Users\andycarr\Documents\14000 General proposals\Avanzar.sip6