IZONE Business Park Expansion - Proposed Plan Change 10

Selwyn District Council

Transportation Assessment Report

October 2009

Traffic Design Group

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IZONE Business Park Expansion - Proposed Plan Change 10

Selwyn District Council

Transportation Assessment Report Quality Assurance Statement

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1. Introduction

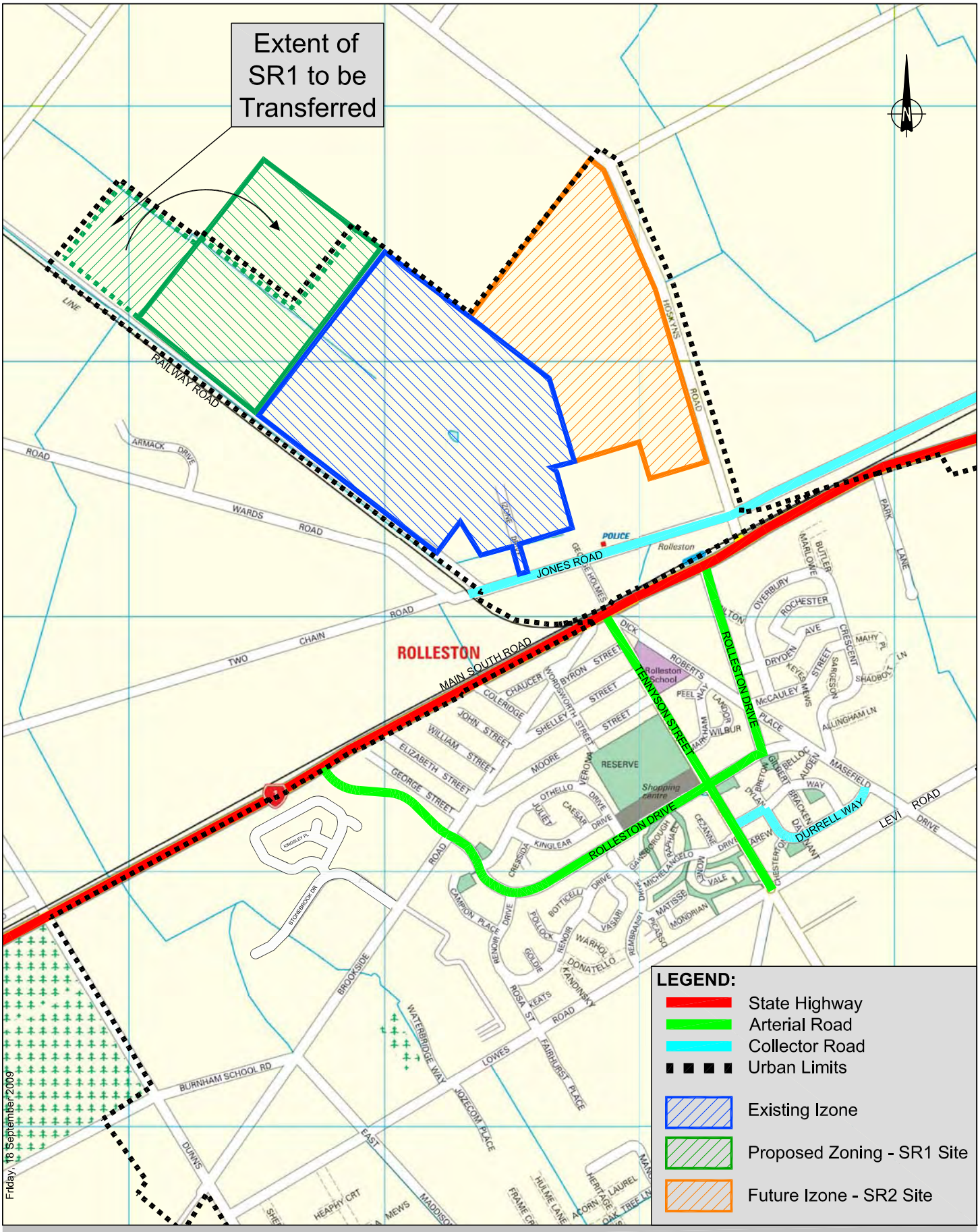
Selwyn District Council is proposing a Plan Change to the Selwyn District Plan (District Plan) to enable business development on approximately 49ha of rural land (SR1) to the north-west of the existing IZONE business park, and to the east of Railway Road in Rolleston as indicated in Figure 1. The Plan Change proposal would result in this land being rezoned from Rural to Business 2A (B2A), being a modification of the existing B2 Zone in the District Plan. The proposed Plan Change will effectively facilitate the expansion of the existing IZONE business park.

The SR1 site is identified in Proposed Change 1 (PC1) to the Regional Policy Statement as an 'L' shaped piece of land, with the proposed urban limits forming the site perimeter on all but the southeast boundary. The area of SR1 identified in this Plan Change application differs from the area in PC1 in that it forms a more regular rectangular shape. This is discussed in more detail later in this report.

This Transportation Assessment addresses the potential transportation effects of the proposed Plan Change and connections to the existing roading network, including reference to the relevant transportation policies and objectives within the Selwyn District Plan and the Canterbury Regional Policy Statement (including the Proposed Change1), and the recommendations of Christchurch Rolleston and Environs Transportation Study (CRETS).

This assessment also considers the implications of travel to and from the site on the adjacent transportation network, and demonstrates how any potential adverse effects can be mitigated or avoided. Whilst this Transportation Assessment includes major coverage of travel by private motor vehicle, it also recognises the importance of other forms of transport. Consequently consideration has also been given to the function of public transport, walking and cycling in association with the IZONE expansion.

The IZONE site is located adjacent to a growing residential population, providing a large employment base and with easy access to the strategic road network. Accordingly the Plan Change is considered to be consistent with the objectives of the Land Transport Management Act 2003, which aims to achieve an integrated, safe, responsive and sustainable land transport system.



Friday, 18 September 2009

Rolleston Business Zone Expansion

Site Location & Road Hierarchy

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G:\7000-7999\7000-7099\7030-6 IZone 2009\ACAD\REPORT FIGURES 090917\7030-6-C1A.dwg

2. Existing Transport Environment

2.1 Site Location

Figure 1 shows the location of the subject site in relation to the existing IZONE business park, Rolleston Township, and the existing road network, as well as the various roading hierarchy classifications defined in the District Plan. As can be seen the subject site is located immediately north-west of the existing IZONE park. The site lies to the north-west of SH1 and the Main Trunk railway, with Railway Road forming the southwest site boundary. The Midland railway runs adjacent to the southwest side of Railway Road. The main access to the existing IZONE area is off Jones Road to the south and it is proposed to provide an additional future access off Hoskyns Road to the recently rezoned extension to IZONE (the SR2 site), as facilitated through Plan Change 5.

The Main South Road (SH1) is defined in the District Plan as a Strategic Route, providing the main road link along the East Coast of the South Island. Jones Road is defined as a Collector Road and with Railway Road and Hoskyns Road, which are unclassified roads in the District Plan, form part of the wider road network servicing the rural area. Rolleston Drive and Tennyson Street are classified as Arterial Roads in the District Plan and provide the main distributor links between SH1 and the Rolleston Township to the south. The only other direct links to and from SH1 in the vicinity of the site are Brookside Road and the southern extension of Rolleston Drive. The Elizabeth Street connection was closed during 2008 and replaced with the southern Rolleston Drive connection.

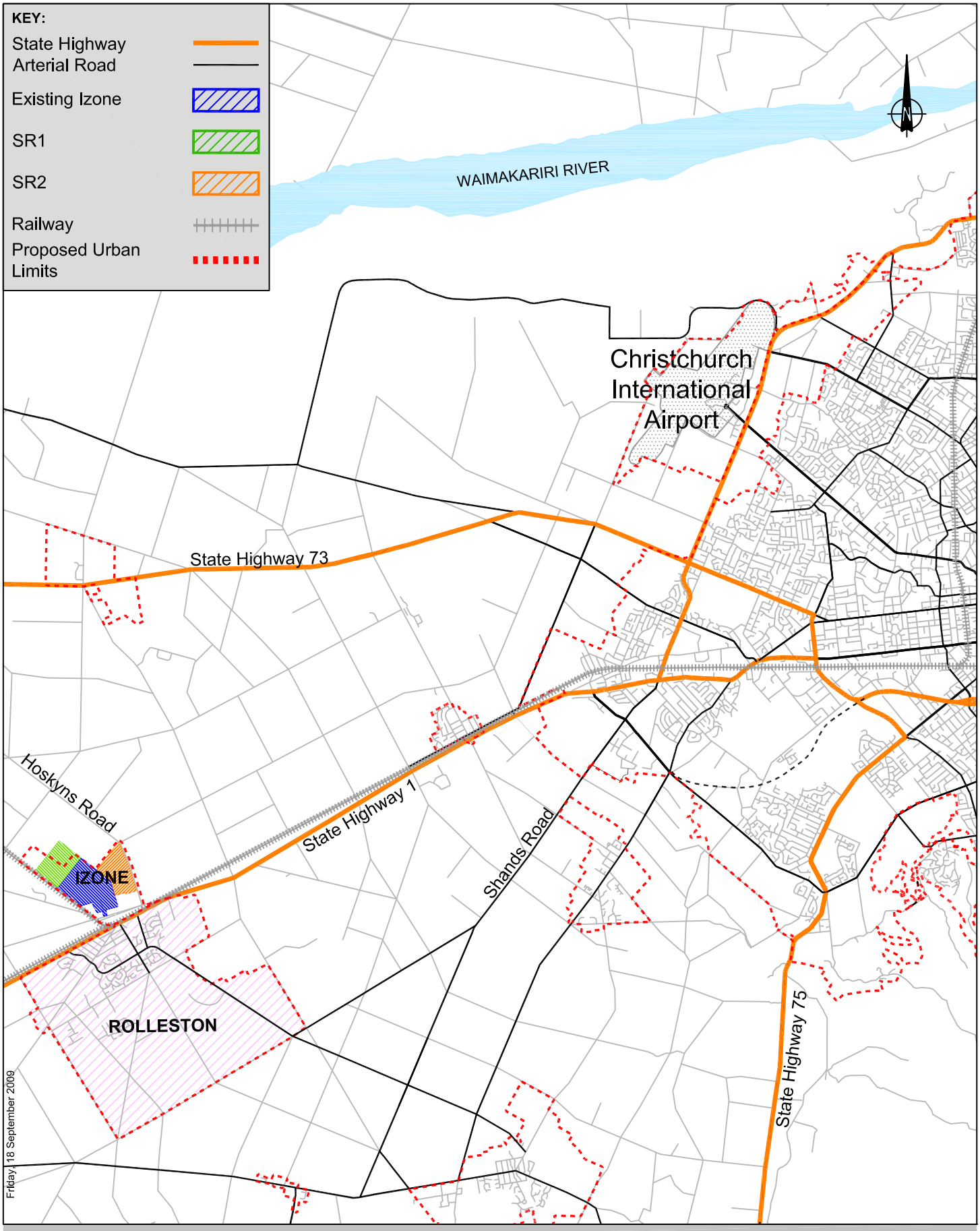
Figure 2 shows IZONE in context with the wider surrounding transport network. As can be seen, IZONE is strategically located in relation to SH1 and railway lines to the north, south and west. It is also well placed in relation to the Christchurch International Airport via SH1 and the Port of Lyttelton, which is easily accessible via Christchurch's arterial ring road or via rail.

2.2 Roading Network

2.2.1 State Highway 1

SH1 generally has a two lane single carriageway through the Rolleston Township which widens to two lanes in each direction with separated carriageways in the vicinity of the signalised intersections of SH1 with Rolleston Drive and Hoskyns Road. SH1 has a posted speed limit of 100km/hr on its rural sections and an 80km/hr speed restriction through Rolleston. Photograph 1 shows the layout of SH1 at the intersection of Rolleston Drive.

Photograph 1: SH1 Layout at the SH1/Rolleston Drive Intersection (looking East)



Rolleston Business Zone Expansion

Site Location - Strategic Transport Network

Traffic Design Group

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The intersections of SH1 with Hoskyns Road and Rolleston Drive were upgraded in 2007 from "Give Way" controlled T-intersections to signalised intersections. Figure 3 shows the layout of the signalised intersections which both provide separate right turn lanes and left turn lanes as well as two through traffic lanes in both directions along SH1. A signalised pedestrian crossing is also provided across SH1 at the SH1/Rolleston Drive intersection.

It is noted that there are some differences between the layout shown in Figure 3 and the as-built situation, such as the provision of two right turn lanes from Hoskyns Road rather than the one shown in Figure 3. Similarly the Rolleston Drive approach is shown in Figure 3 as having a shared left and right lane whereas a separate left turn lane has been provided in addition to the two right turn lanes.

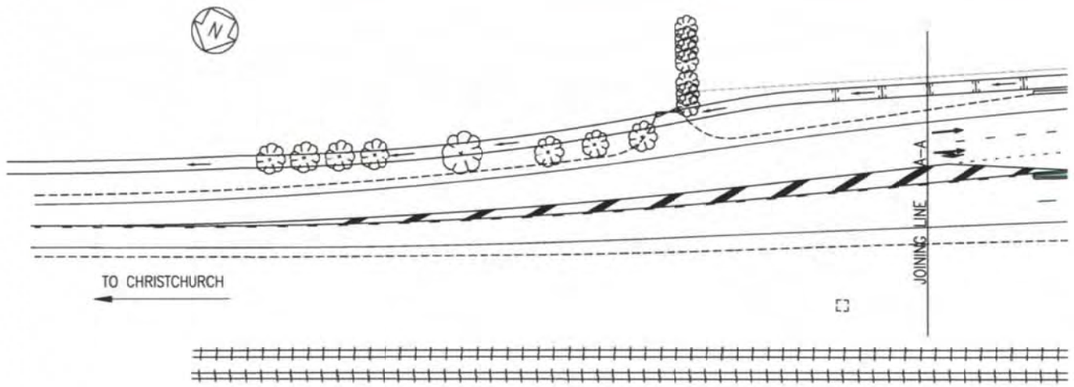
2.2.2 Hoskyns Road

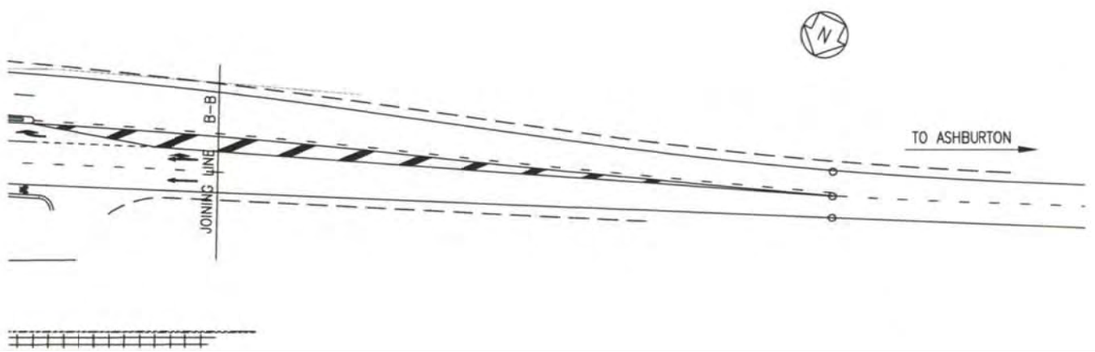
Hoskyns Road in the vicinity of the subject site provides one 3.5m wide traffic lane in each direction. From SH1 to approximately 100m north of Jones Road the posted speed limit along Hoskyns Road is 70km/hr but increases to 100km/hr further to the north. A footpath is provided on the western side of Hoskyns Road between SH1 and Jones Road. Generous grassed berms are also provided on both sides of the carriageway as shown below in Photograph 2.

Photograph 2: Layout of Hoskyns Road

The Main Trunk railway crosses Hoskyns Road between SH1 and Jones Road. The railway crossing is signalised with barrier arms as shown in Photograph 3.

Photograph 3: Rail crossing on Hoskyns Road





TRANSIT NEW ZEALAND

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Friday, 18 September 2009

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Rolleston Business Zone Expansion

Layout of Signalised Intersections on State Highway 1

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Traffic Design Group

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2.2.3 Jones Road

Jones Road provides one 3.5m wide traffic lane in each direction, separated by a 3.1m wide central flush median between Hoskyns Road and Railway Road. Yellow “no stopping” lines are marked on both sides of the carriageway between Hoskyns Road and Railway Road. This section of Jones Road also has a posted speed limit of 60km/hr. A footpath is provided on the northern side of the carriageway between Railway Road and George Holmes Road. Photograph 4 shows the layout of Jones Road in the vicinity of IZONE.

Photograph 4: Layout of Jones Road

The intersection of Jones Road and IZONE Drive is “Stop” sign controlled with Jones Road having priority. A right turn bay is provided on the Jones Road approach and separate right and left turn lanes are provided on the IZONE Drive approach as shown below in Photograph 5.

Photograph 5: Jones Road/ IZONE Drive Intersection

2.2.4 Railway Road

Railway Road in the vicinity of the subject site provides one 3.5m wide traffic lane in each direction. It has a posted speed limit of 70km/hr near Jones Road which increases to 100km/hr to the north of the existing IZONE site. Railway Road is sealed for a distance of approximately 230m north of the intersection with Jones Road, beyond which Railway Road becomes a gravel road with grassed berms on both sides of the carriageway, as shown in Photograph 6. There are no footpaths alongside Railway Road. The intersection of Railway Road and Jones Road is a “Give Way” controlled T-intersection with priority to traffic on Jones Road. Concrete kerbing is provided on both corners of the intersection.

Photograph 6: Layout of Railway Road

2.2.5 Existing IZone Site

IZONE Drive (the primary road within the existing IZONE business park) consists of two 6.5m wide lanes separated by a central landscaped median strip. A footpath is provided on the eastern side of the road, with generous berms also provided on both sides of the road. Breaks in the median and right turn bays are also provided to allow for access to key individual sites. A roundabout in the mid-section of the road also enables vehicles to turn to access sites where direct access is blocked by the median strip. This boulevard road has been designed to a high level of amenity and caters well for pedestrians and cyclists through the provision of footpaths and wide traffic lanes. Photograph 7 below shows the general layout of IZONE Drive.

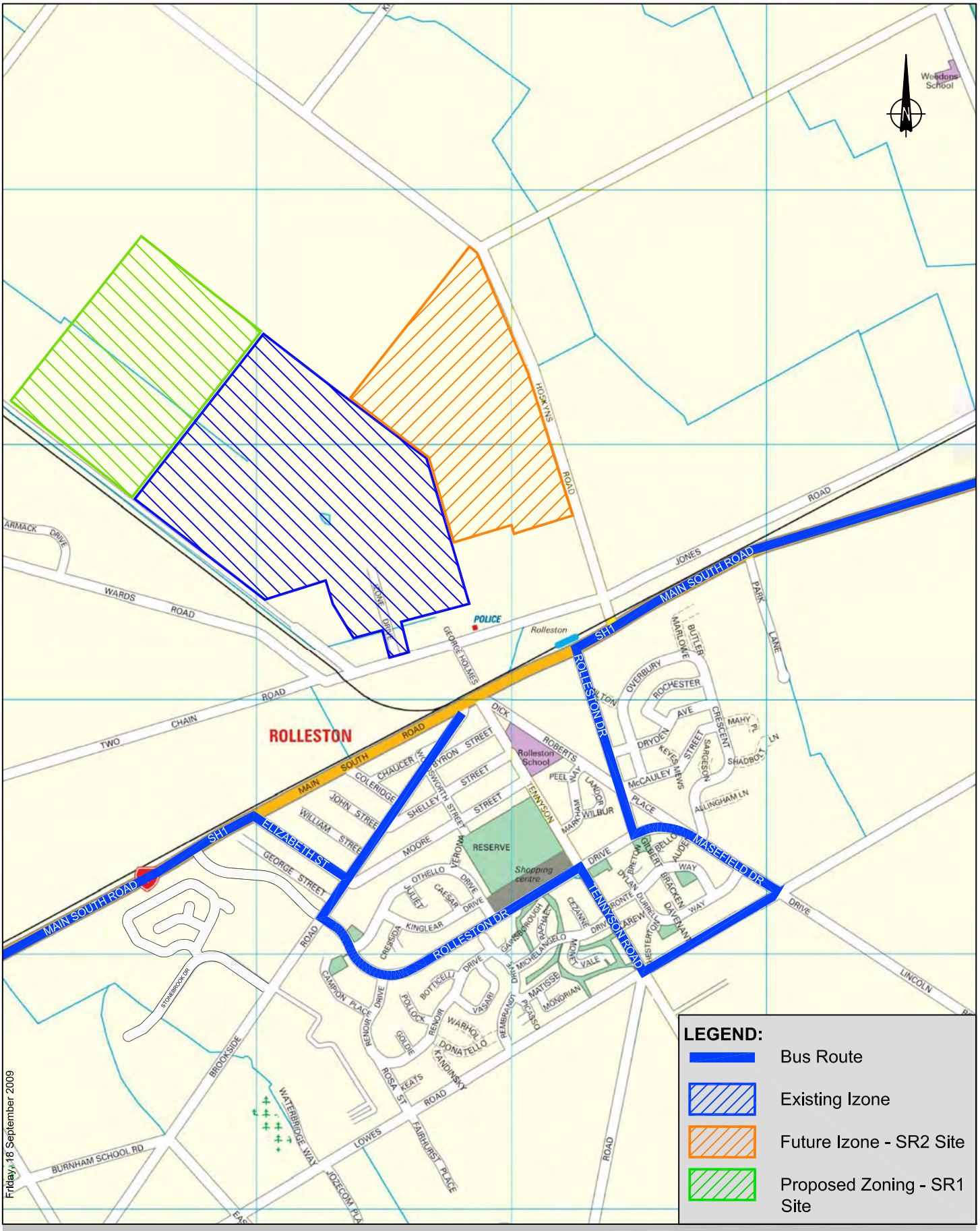
Photograph 7: Layout of IZONE Drive

2.3 Public Transport

Environment Canterbury operates a public bus service between Burnham, Rolleston and Hornby, with this route in the peak periods extending to and from the Christchurch CBD. The route currently operates along Main South Road to the east and west of Rolleston. The route through Rolleston is shown in Figure 4.

The service typically operates with a weekday frequency of one trip per hour in each direction, with additional services operating with a frequency of one trip every 15-20 minutes in the morning commuter peak and one trip every 15-30 minutes during the evening commuter peak. Weekend services also operate hourly in each direction, with Sunday services terminating in the late afternoon.

The nearest bus stops to the IZONE site are situated on Brookside Road and Rolleston Drive (east).



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Rolleston Business Zone Expansion

Existing Bus Route

Traffic Design Group

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2.4 Pedestrian Facilities

There is a pedestrian path on the north side of SH1 between the intersections of SH1/Rolleston Drive and SH1/ Hoskyns Road. Photograph 8 below shows this pedestrian path.

Photograph 8: Pedestrian path on SH1

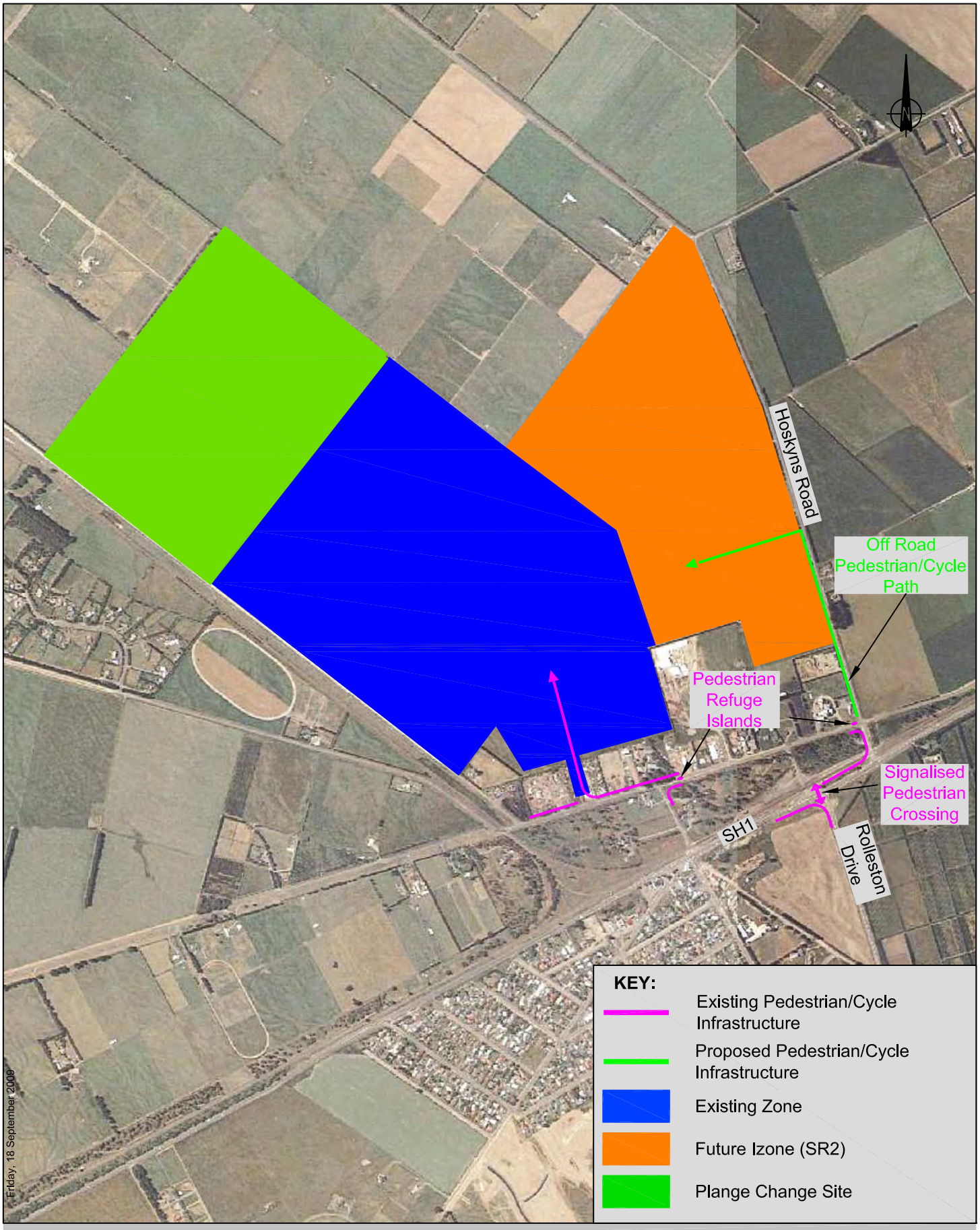
The pedestrian path connects the signalised pedestrian crossing at the SH1/Rolleston Drive intersection to the footpath on the western side of Hoskyns Road. A short pedestrian footpath also exists on the southern side of SH1 between Rolleston Drive (east) and the bus stop to the west of Rolleston Drive (approximately 70m in length). The combined pedestrian facilities on SH1 allow for safe pedestrian movements between the Rolleston Township (via Rolleston Drive) and the existing business area located on Jones Road (including IZONE). Figure 5 summarises the existing pedestrian and cycle infrastructure in the area.

Through the recently approved Plan Change 5 it is proposed to provide an internal road network with footpaths on at least one side of the carriageway and also mid-block pedestrian linkages. Wide traffic lanes are proposed to safely accommodate cycle movements. Additionally, an upgrade of Hoskyns Road is proposed which will include an off-road pedestrian and cycle path along the western side, connecting between the end of the existing footpath and the proposed new IZONE access.

2.5 Cycle Facilities

There are no separate cycle lanes on any of the roads surrounding the subject site, however sufficient width is provided within the carriageways of IZONE Drive, Jones Road and Hoskyns Road to allow for safe cyclist movements. The carriageway of Railway Road is predominantly gravel and does not currently provide a route amenable to cycling.

Plan Change 5, which extends IZONE to Hoskyns Road (SR2), includes future provision for a cycleway along the western side of Hoskyns Road.



Rolleston Business Zone Expansion

Indicative Pedestrian & Cyclist Facilities

Traffic Design Group

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3. Current Traffic Conditions

3.1 Peak Traffic Flows

Key intersections in the vicinity of the IZONE site (SH1/Hoskyns Road, SH1/Rolleston Drive, Hoskyns Road/Jones Road and Jones Road/Izone Drive) were surveyed by Traffic Design Group on Wednesday 27 June and Thursday 28 June 2007 during the morning (7:00am to 9:00am) and evening (4:30pm to 6:30pm) weekday commuter peak periods to gain an understanding of the existing traffic flows. The results of the survey showed that the morning peak hour was 7:30 to 8:30am and the evening peak hour was 4:30 to 5:30pm.

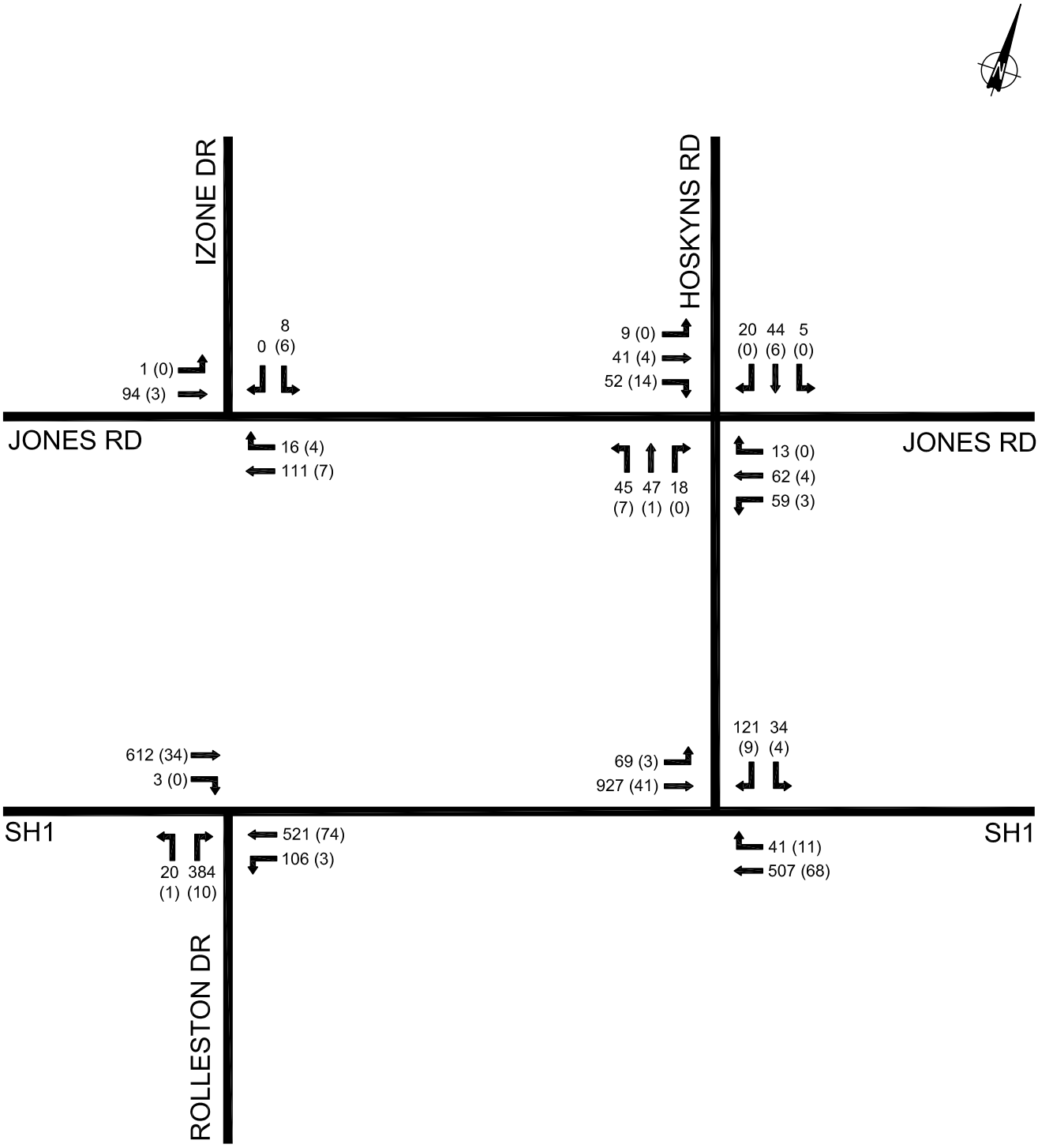
The surveyed peak hour traffic flows, illustrated by turning movement volumes, are presented in Figures 6 and 7.

More recent traffic counts were carried out at a number of locations near the Plan Change site during August 2009. These surveys were conducted as part of the agreed monitoring to be carried out under the Plan Change 5 conditions in order to identify any potential local network effects.

On Tuesday 18 August a traffic survey was carried out between 7am and 6:45pm at the intersection of West Melton Road/Hoskyns Road. The morning peak hour for the intersection was found to be from 7:30am to 8:30am and the evening peak hour was from 3pm to 4pm. During the morning peak hour 137 vehicles passed through the intersection of which 13 (or 9%) were heavy vehicles while during the evening peak 146 vehicles passed through the intersection, with 13 (or 9%) being heavy vehicles. As can be seen in Figures 8 and 9, only 11 of the heavy vehicles used West Melton Road during the peak periods.

On Monday 17 August a survey was carried out at the intersection of Hoskyns Road/Knights Road between 7am and 7pm. The morning peak hour was found to be 7:30am to 8:30am and the evening peak hour was found to occur between 4:30pm and 5:30pm. During the morning peak 99 vehicles travelled through the intersection, of which 9 (9%) were heavy vehicles and during the evening peak hour a total of 143 vehicles passed through the intersection, 7 vehicles (or 5%) of these being heavy vehicles. Only one heavy vehicle was observed to use Knights Road during the peak hours and over the 12 hours surveyed only three heavy vehicles were observed on Knights Road.

The survey conducted on 25 August 2009, was at the intersection of Weedons Ross Road/Maddisons Road where the morning peak hour was found to be 7:30am to 8:30am and the evening peak hour was from 4:30pm to 5:30pm. Figures 8 and 9 show the peak hour turning movements with 12 (9%) heavy goods vehicles on the western section of Maddisons Road in the AM peak and only five (3%) in the PM peak. The section of Weedons Ross Road to the south passing the local primary school carried seven (7%) heavy vehicles in the AM peak and four (3%) in the PM peak. The results of the 12 hour survey, carried out between 7am and 7pm, showed that the traffic volumes on Maddisons Road west of Weedons Ross Road during this period were 388 eastbound, of which 38 (10%) were heavy goods vehicles, and 484 westbound with 46 (10%) being heavy goods vehicles. Previous count data, obtained from automatic traffic counts for Maddisons Road in August 2008, indicated that the 12hr count equated to approximately 85% of the 24hour count therefore the current 24hr count for Maddisons Road is expected to be in the order of 456 vehicles eastbound and 569 vehicles westbound, giving a total of 1,025 vehicles per day. This is not significantly higher than the 2008 count.



KEY:

XX=Total Number of Vehicles
(XX)=Heavy Vehicles Included in Total

AM PEAK HOUR: 7:30 - 8:30am

Friday, 18 September 2009

Rolleston Business Zone Expansion

2007 Traffic Volumes AM Peak

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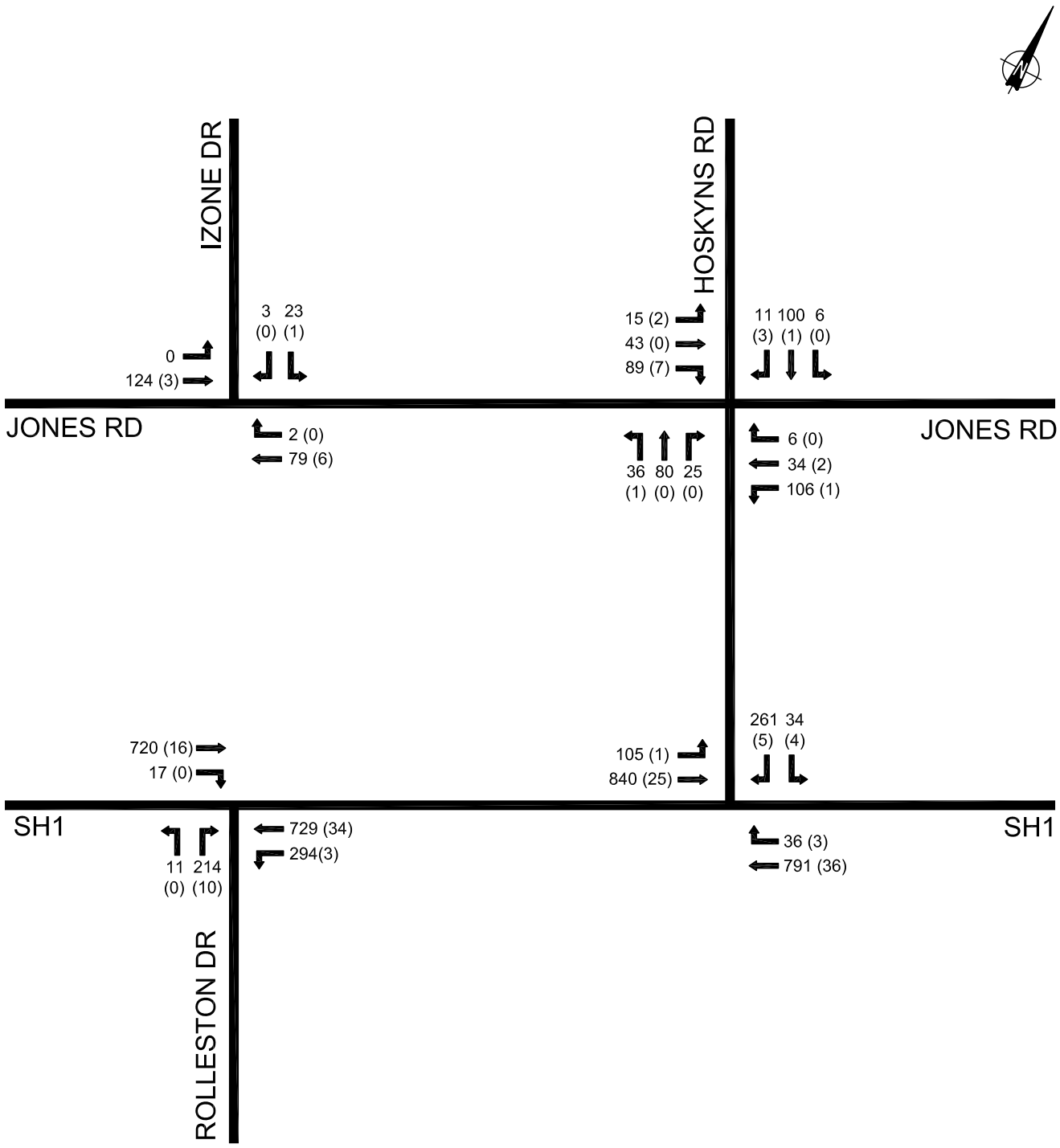

KEY:

XX=Total Number of Vehicles
(XX)=Heavy Vehicles Included in Total

PM PEAK HOUR: 4:30 - 5:30pm

Friday, 18 September 2009

Rolleston Business Zone Expansion

2007 Traffic Volumes PM Peak

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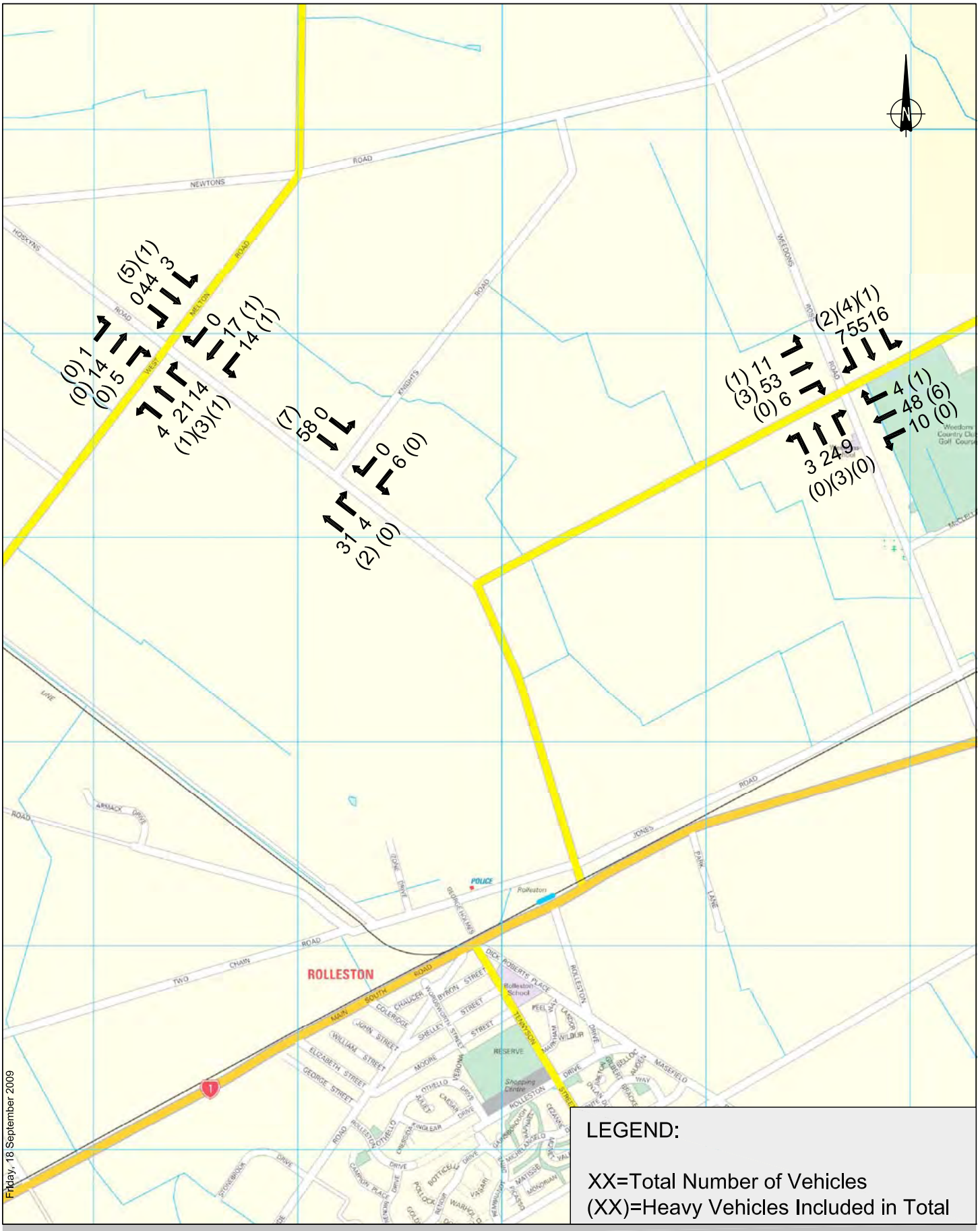

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Rolleston Business Zone Expansion

Existing Traffic Volumes AM Peak

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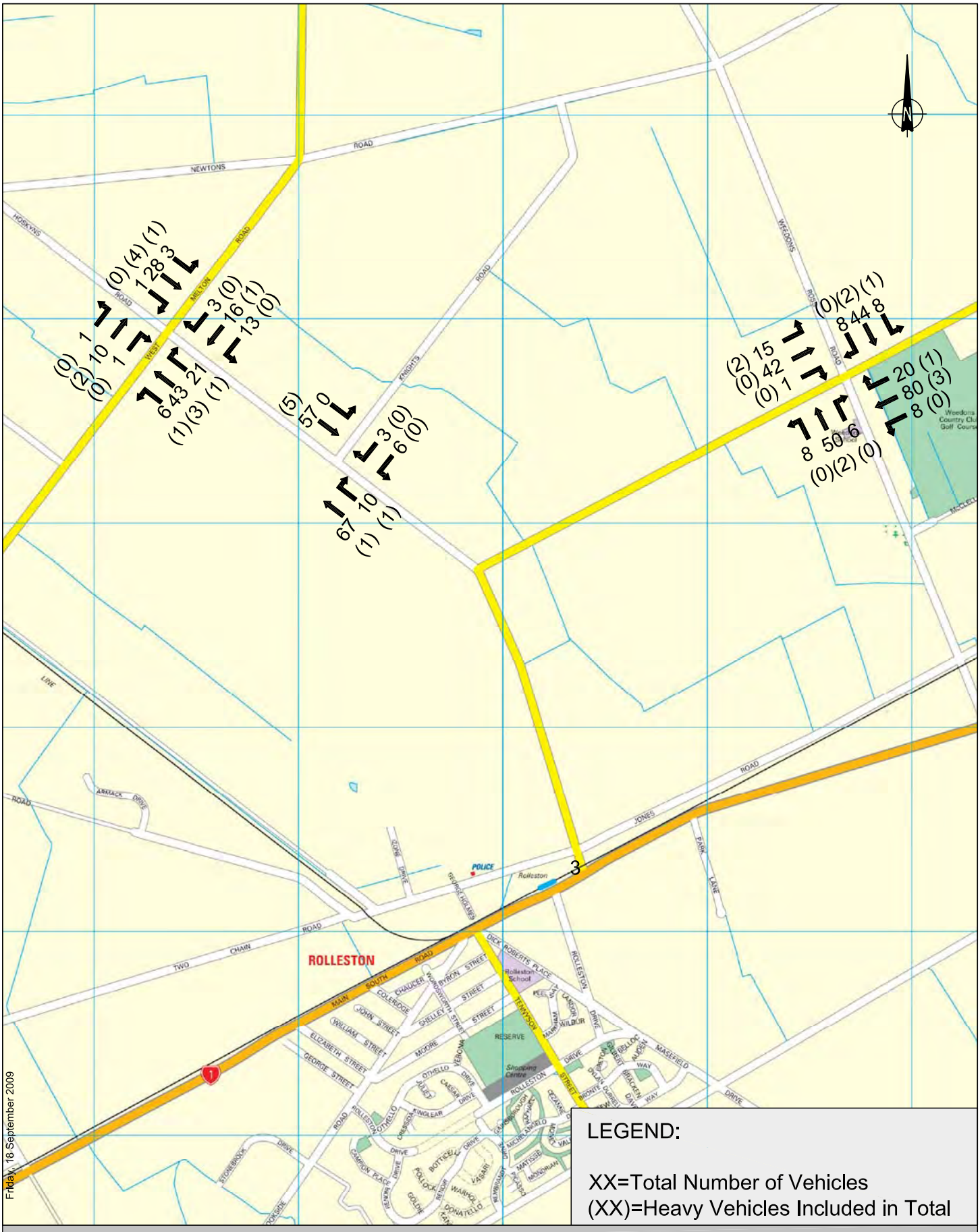

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Rolleston Business Zone Expansion

Existing Traffic Volumes PM Peak

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3.2 Izone Drive Traffic Count

A recent automatic traffic count was carried out on Izone Drive for the week beginning Saturday 5th September 2009. The results of this traffic count are shown in Figure 10. This traffic count shows that the weekday morning peak hour for Izone Drive occurs between 7am to 8am with 180 vehicle trips, of which 145 are entering the site and 45 are exiting. The evening peak hour occurs between 4pm and 5pm with 145 vehicle trips, of which 118 are exiting the site and 27 are entering.

3.3 Daily Traffic Volumes

Traffic counts obtained from the Selwyn District Council and NZ Transport Agency (formerly Transit New Zealand) for roads surrounding the subject site are summarised in Table 1.

Location	Average Daily Traffic (vpd)	Year
SH1, south of Weedons Ross Road	18,270	2008
Main South Road (SH1), south of Burnham Road	9,568	2008
Hoskyns Road between SH1 and Jones Road	3,175	2005
Jones Road west of Hoskyns Road	1,142	2006
Rolleston Drive between Tennyson St and Othello Dr	3,317	2007
Tennyson Street, south of SH1	4,038	2007

Table 1: Daily Traffic Volumes

The average daily traffic (ADT) volume for Rolleston Drive recorded south of Norman Kirk Drive in June 2009 was 6,166 vpd.

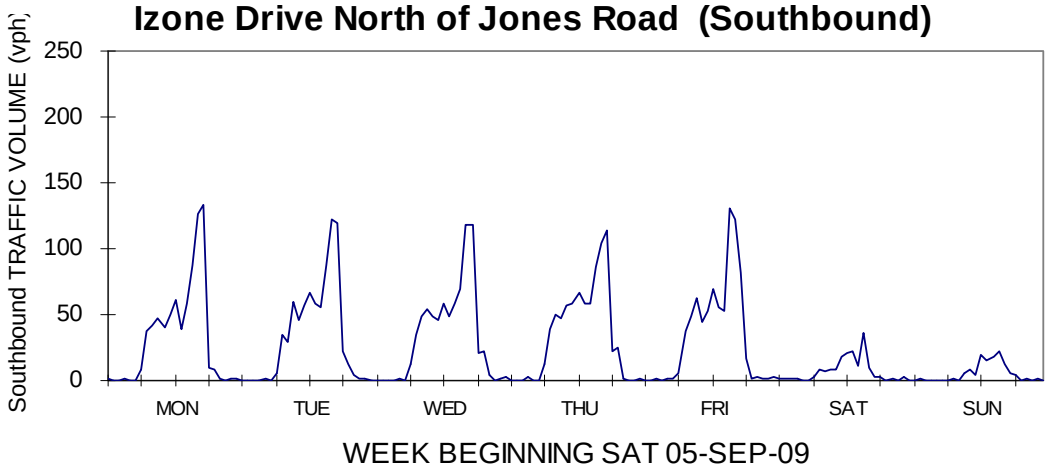
The traffic flows along Hoskyns Road between Jones Road and SH1 have increased since the 2005 count and peak hour survey counts indicate a daily volume of approximately 4,000vpd.

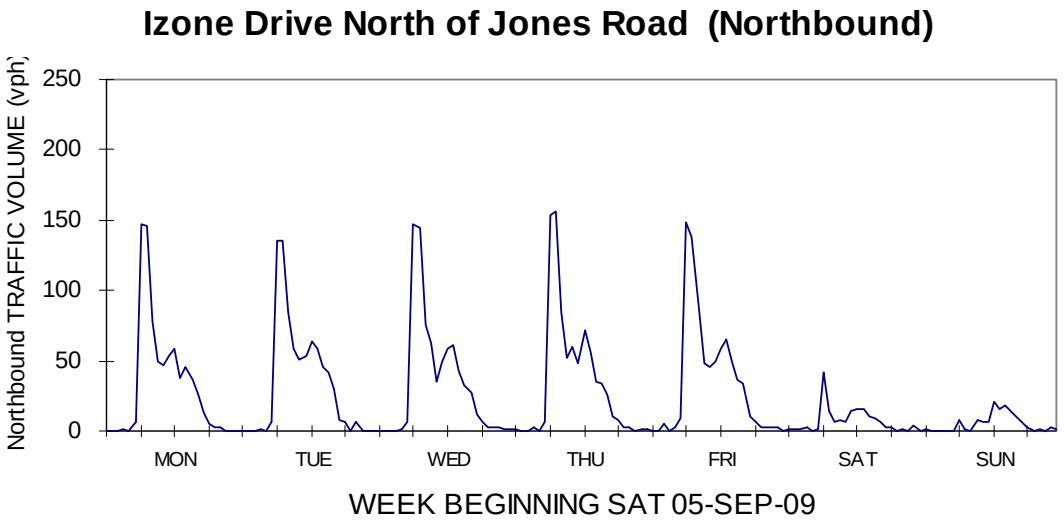
3.4 State Highway Traffic Patterns

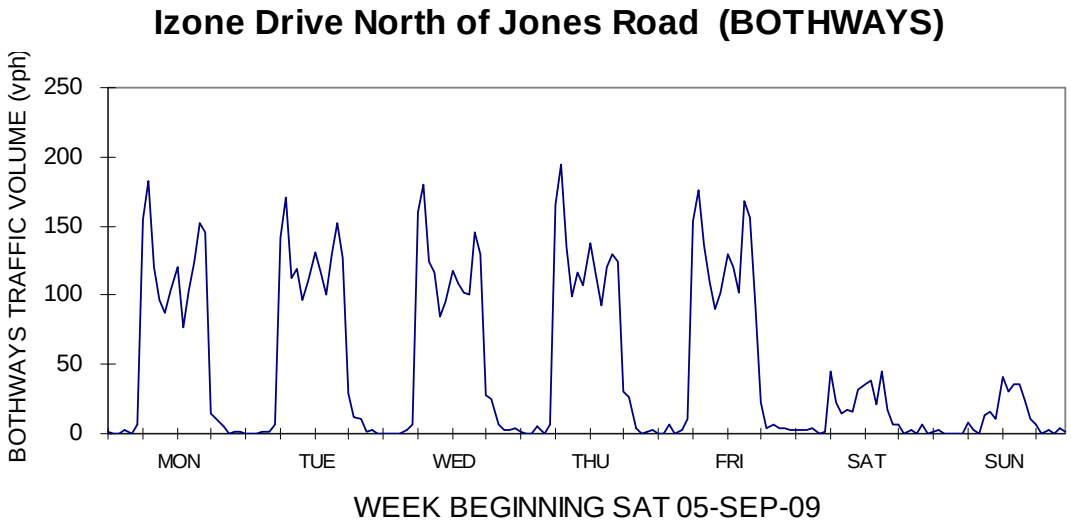
The traffic patterns along SH1 near Rolleston (south of Weedons Ross Road) have been assessed using an automatic traffic count recorded in October 2008 as part of the NZ Transport Agency's national counting program. The pattern of hour by hour flows in this location over the period of a week is illustrated in Figure 11.

The main features to note from the pattern recorded on this section of highway are:

- the directional flows recorded through the course of the weekdays show distinctive peaks in northbound volumes during the morning commuter period of around 1,000 vehicles per hour (vph) and also distinctive and consistent peaks of around 1000vph in the southbound direction during the evening peak commuter period.
- both Saturday and Sunday patterns display a broad spread of traffic activity through the course of each day, rising to a maximum of approximately 1,600vph (two-way) during the late morning on Saturday.
- the highest single directional flow is approximately 1,050vph northbound on Monday during the morning commuter peak period.







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Rolleston Business Zone Expansion

Izone Drive Hourly Volumes

Traffic Design Group

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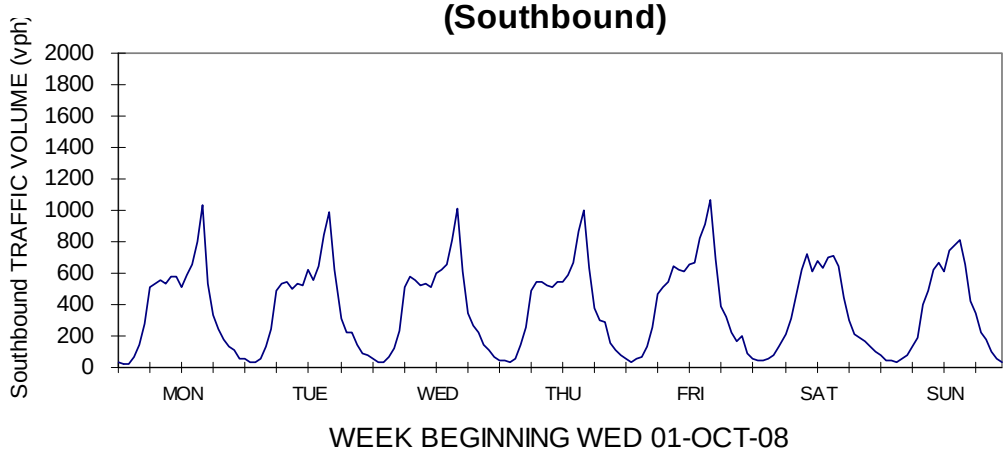
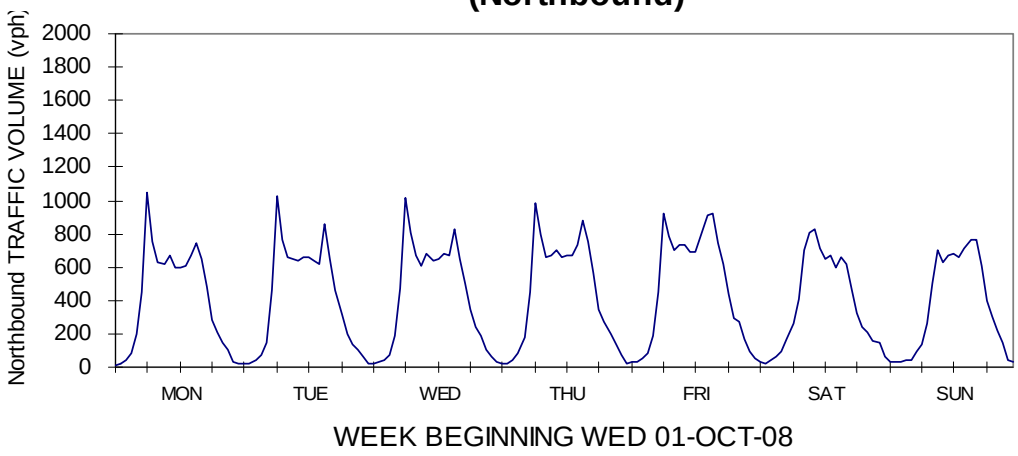
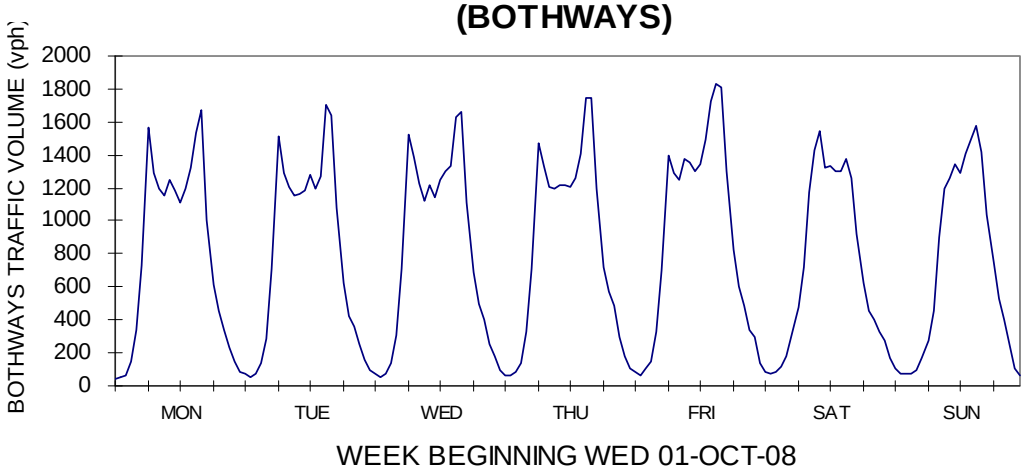
SH1 - Rolleston, Sth of Weedons Ross Rd (Southbound)



SH1 - Rolleston, Sth of Weedons Ross Rd (Northbound)



SH1 - Rolleston, Sth of Weedons Ross Rd (BOTHWAYS)



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Rolleston Business Zone Expansion

SH1 Hourly Volumes

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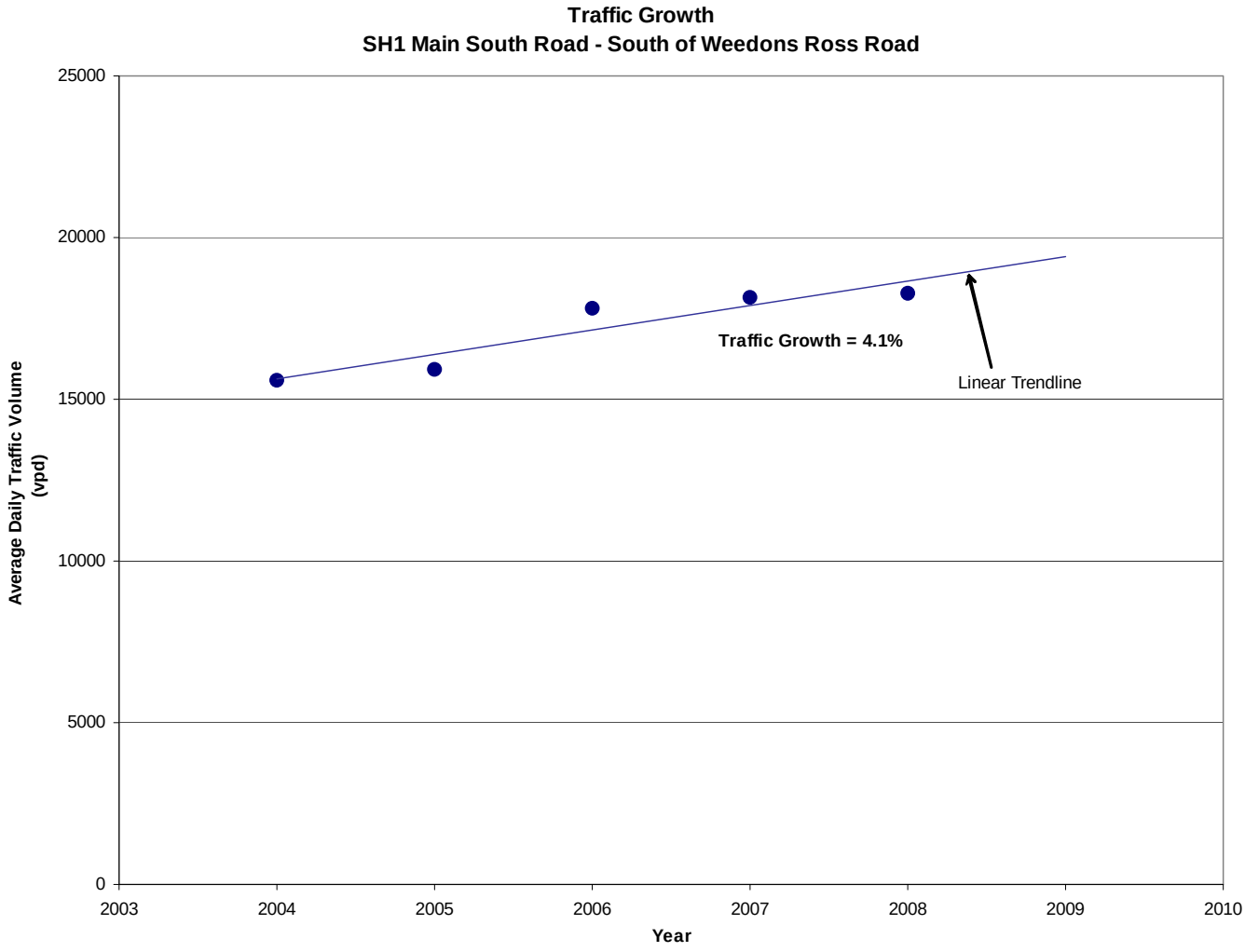
This SH1 traffic pattern exhibits a distinct level of peak hour commuter travel between Rolleston and the major employment centres to the north (Christchurch), while also displaying a steady demand through the middle of the day with activity corresponding to personal, freight and business travel. Moderate recreational traffic flows are also evident during the weekend along this section of the highway.

3.5 State Highway Traffic Growth

Figure 12 displays the traffic growth on SH1, calculated from regular traffic counts undertaken by the NZ Transport Agency on SH1 south of Weedons Ross Road. Annual average daily volumes (AADT) recorded at the count site have increased from 15,600 vehicles per day (vpd) in 2004 to 18,270vpd in 2008. This represents an average linear growth of 760vpd or approximately 4.1% per annum expressed in relation to the 2008 average daily volume.



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Rolleston Business Zone Expansion

SH1 Traffic Growth

Traffic Design Group

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4. Road Accidents

The Land Transport New Zealand Crash Analysis System (CAS) has been used to identify all reported crashes on the key routes within the study area. The search covered all reported crashes, both injury and non-injury, for the most recent full five year period between 2004 and 2008 inclusive, as well as all available reports for the partial 2009 records.

A total of six injury (five minor injury and one fatal) crashes and eight non-injury crashes were reported in close proximity of the subject site as indicated in Figure 13.

Seven of the crashes occurred at the intersection of Main South Road (SH1) and Hoskyns Road, of which four were non-injury crashes and three were listed as minor injury crashes. Three of the non injury crashes and two of the minor injury crashes involved vehicles turning right to/from Hoskyns Road failing to give way to through traffic. It is noted however that all of these crashes occurred prior to signals being installed at the intersection in the later half of 2007. The fourth non-injury crash at this intersection was classified as a rear end crash caused by a vehicle crashing into another stopped at the traffic signals and occurred following the traffic signal upgrade. The remaining injury crash involved an SUV travelling south on Hoskyns Road losing control while turning left. Vehicle speed and driver overreaction were listed as contributing factors, with a slippery road due to heavy rain listed as an environmental factor.

Of the crashes that did not occur at the SH1/Hoskyns Road intersection, one fatal injury crash occurred at the rail crossing on Two Chain Road (immediately west of the Railway Road / Jones Road intersection) and was the result of a vehicle failing to stop at the “Stop” sign and hitting an oncoming train. It should be noted that the crossing has been upgraded subsequently with the installation of bells and lights. One minor injury crash was also reported on Jones Road and was the result of a motorcyclist losing control when entering/exiting a private driveway. One non-injury crash occurred on Railway Road approximately 200m north of Jones Road and involved a northbound car losing control and hitting a post on the side of the road. The remaining minor-injury crash occurred at the Railway Road/West Melton Road intersection and was the result of a driver travelling south on West Melton Road failing to give way to through traffic.

Although not in the immediate vicinity of the Plan Change area, an additional three crashes occurred on Hoskyns Road within 50m of the intersection with Maddisons Road with all listed as non-injury crashes. Two of these crashes were the result of southbound vehicles on Hoskyns Road losing control while manoeuvring the right hand bend on Hoskyns Road immediately at the intersection. The third crash was the result of a northbound vehicle on Hoskyns Road losing control and colliding with a post/pole. Alcohol was listed as a contributing factor for this crash.

With good sight distance available at the intersections in the immediate vicinity of the subject site, there are no significant engineering deficiencies attributable to these crashes and they are instead primarily the result of driver error. With the upgrading of the SH1 intersections to traffic signal control, this crash record does not suggest that there are any significant underlying safety issues on the roads in the vicinity of the development area.

Friday, 18 September 2009

Rolleston Business Zone Expansion

Crash Locations

Traffic Design Group

13

SCALE: 1:20

G:\7000-7999\7000-7099\7030-6 IZone 2009\ACAD\REPORT FIGURES 090917\7030-6-C13B.dwg

5. Strategic Roading Proposals

5.1 Christchurch Rolleston and Environs Transport Study (CRETS)

The Christchurch Rolleston and Environs Transport Study (CRETS), commissioned by Transit New Zealand (now NZ Transport Agency), Selwyn District Council, Christchurch City Council, Environment Canterbury and Christchurch International Airport Limited, focused on identifying deficiencies in the strategic transport network to the west and south of Christchurch and on developing and assessing various options to find a strategy to offset the shortcomings identified. The area assessed included Rolleston and IZONE.

The principal changes to the roading network recommended by the CRETS study that relate to IZONE were:

- Provision of a new grade-separated connection between the Rolleston Township and IZONE by connecting Rolleston Drive with Hoskyns Road, near the Hoskyns Road/ Jones Road intersection which was recommended to be upgraded to a roundabout. The connection was indicated as a ground-level bridge which included pedestrian and cycle facilities, over SH1 which formed an underpass. A railway level crossing was retained but there was no connection between SH1 and Hoskyns Road or Rolleston Drive.
- Upgrading Hoskyns Road between Jones Road and SH73 to a District Arterial standard to improve access to the north/west.
- Construction of a full diamond, grade-separated interchange at the SH1 / Weedons Road / Weedons Ross Road intersection. This interchange was to provide the primary access to the IZONE from the east (Christchurch) via Weedons Ross Road and Jones Road and also to the Rolleston Township via Weedons Road and Levi Road.
- Upgrading of the Pound Road (Barters Road) route from Yaldhurst to Templeton and signalisation of its intersection with SH1
- Development of a secondary local roading alternative to SH1 via Shands Road, Selwyn Road and Lincoln-Rolleston Road incorporating road upgrades and intersection priority changes.

These roading projects have all been adopted into the latest Regional Land Transport Programme (RLTP), with State Highway projects now included in the National Land Transport Programme (NLTP) and local projects in the Selwyn District Councils LTCCP. The NLTP issued by the NZ Transport Agency on 27th August 2009 includes the Pound Road/Barters Road intersection which has funding allocated in the 2010/2011 financial year for investigation into the installation of traffic signals.

As indicated in Figure 13, the upgrade of the Selwyn Road / Shands Road route is included in the 10-year programme of the latest RLTP for Canterbury and is also in the Selwyn District Council's LTCCP for 2012-14.

The CRETS study also noted that while it is not necessarily beneficial for SH1 and the Main Trunk railway to segregate the residential and business areas of Rolleston, it is not practical or economical to change this. Instead a grade-separated connection between the two areas is proposed, allowing travel between the residential and business portions of Rolleston to be unimpeded by SH1 traffic flows. The study also suggests that a further grade-separated pedestrian/cyclist link closer to Tennyson Street would help encourage the use of these alternative transportation modes for people living in Rolleston and working in IZONE.

As well as improving the quality of access between Rolleston and the business area on the northern side of SH1 for all modes of travel, the CRETS proposals are expected to improve access to SH1 along its length from Hornby to Rolleston. Currently the western-most signalised intersection on SH1 in Christchurch is Halswell Junction Road, which was completed earlier this year. The next signalised access point is approximately 11km further west, at the Hoskyns Road/SH1 intersection in Rolleston.

The signalised Halswell Junction Road intersection provides connection with the proposed Christchurch Southern Motorway Extension (Stage 1) via Halswell Junction Road which is scheduled to be upgraded as part of the motorway extension. In the longer term it is also intended that the Southern Motorway should be further extended from Springs Road/Halswell Junction Road to join SH1 south of Templeton.

The abovementioned proposals are expected to increase the attractiveness of SH1 and reduce the need for traffic to use alternative routes. In fact the CRETS study concluded for example, that traffic volumes on Maddisons Road which runs parallel to SH1 will have decreased by some 30% in 2021 compared with 2001 volumes.

Hoskyns Road between SH1 and SH73 will take on District Arterial status with provision of the grade-separated connection between Rolleston Township and the business area. However, the access that Hoskyns Road is currently providing from IZONE to SH1 will be replaced by the interchange at SH1/Weedons Ross Road.

5.2 National Land Transport Programme

The National Land Transport Programme 2009/12 has been developed by the NZ Transport Agency to allocate funds to approved organisations for land transport infrastructure and services for the next three years.

The NLTP has been developed in two sections. The first section outlines the strategies and funding at a national level while the second section identifies projects and funding at the regional levels throughout the country.

The NLTP includes a number of roading projects in the Rolleston-Christchurch area, in addition to the Pound Road/Barters Road project mentioned earlier, which will provide benefit to the performance of the road network affecting IZONE. The projects identified in the NLTP in the vicinity of the Plan Change site are: the construction of the Southern Motorway extension (2010-2013); the investigation, design and property purchase phases of Stage 2 of the Christchurch Southern Motorway extension (Halswell Junction Road to Waterholes Road) and the SH1/Tennyson Street intersection improvement.

5.3 Canterbury Transport Regional Implementation Plan

The Canterbury Transport Regional Implementation Plan 2008-2038 (TRIP) has been developed by the Canterbury Land Transport Management Committee to ensure that there is a coordinated approach in delivering the Regional Land Transport Strategy (RLTS). TRIP also allows activities that are identified in a number of different agencies management plans to be prioritised across the region.

The main objectives of TRIP are as follows:

- Providing an implementation framework for transport in the region.
- Ensuring a 'regional' picture for transport and land use is obtained.
- Developing an advocacy and planning tool in order to progress key projects.
- Assisting with input into 'regional' funding allocation discussions.
- Informing the RLTS review by providing content for the implementation and funding chapters.

The projects recommended by CRETS have generally been incorporated in the Canterbury Transport Regional Implementation Plan (TRIP), with timeframes proposed based on regional funding prioritisation to assist the ability of the Road Controlling Authorities to secure the necessary funds to implement the strategy.

There are eight transport packages within TRIP for the Greater Christchurch sub-region with Rolleston being included within that for the Selwyn South/West Approach package.

The context of the Selwyn South/West Approach package is as follows:

> *"Important national routes run through the area to Christchurch from the South (SH1) and West (SH73), which are becoming very busy nearer Christchurch, creating safety issues and adverse environmental impacts from local and through traffic. The area contains growing urban settlements (e.g. Rolleston and Templeton) as well as a range of villages that create transport demands between these urban areas and Christchurch. Rolleston is identified in the UDS as a significant growth area over the next 35 years."*

The response of the package is as follows:

- Road improvements, mainly focussed on arterial network and local development needs of growing towns, for safety and efficiency, and minimising adverse environmental effects.
- Travel behaviour change programmes as part of Greater Christchurch TDM implementation.
- New and improved public transport services with associated infrastructure improvements to provide transport alternatives.
- Walk/Cycle improvements for local accessibility, and to provide transport alternatives for some trips.
- Protection of rail corridor, with some use for freight transport particularly to Christchurch from west and south.

Table 2 indicates the implementation timing currently expected for the roading projects in the area suggested by TRIP that are related to IZONE. It also displays the implementation timing for projects in TRIP related to enhancing the use of other modes of travel such as walking, cycling and public transport.

COMPONENTS	TIMEFRAME (YEARS)	RESPONSIBLE AGENCY
Road Improvements		
Main South/Barters realignment/signals	0-10	NZTA
Rolleston – Hornby road corridor (Selwyn/Shands to Marshs)	0-10	SDC
Tennyson – Brookside intersection/slip lane	0-10	NZTA
Rolleston arterial roading and intersection upgrades	0-10	SDC
Southern Motorway extension stage 2, including Shands interchange	11-20	NZTA
Rolleston Drive overbridge and roading to IZONE	11-20	SDC/NZTA
SH1 four-laning Weedons Ross to Waterholes	11-20	NZTA
SH1/Weedons Ross interchange	11-20	NZTA
Public Transport Improvements		
New Public transport services and improved services for Southern-Western Approach (increased frequencies on existing services such as the Lincoln/Rolleston/Hornby shuttle and the Rolleston to City Service)	0-10	ECAN
Park and Ride Schemes (Rolleston) and other public transport infrastructure (bus shelters, seats and stop infrastructure for new services/increased patronage areas)	0-10	SDC
Other Improvements		
Infrastructure improvements for walking and cycling modes from Selwyn District Council Walking and Cycling Strategy, including Rolleston – Hornby off-road cycleway	0-10	SDC
Education, travel behaviour change programmes	0-10	SDC
New and expanded rail lines for freight to Izone	0-10	SDC
Rolleston Pedestrian overbridge to Izone	11-20	SDC

Table 2: Components of Selwyn South/West Approach Package in TRIP

It can be seen from Table 2 that several key upgrades are planned to be completed within the next ten years. These upgrades and others in the wider area are illustrated in Figures 14 and 15.

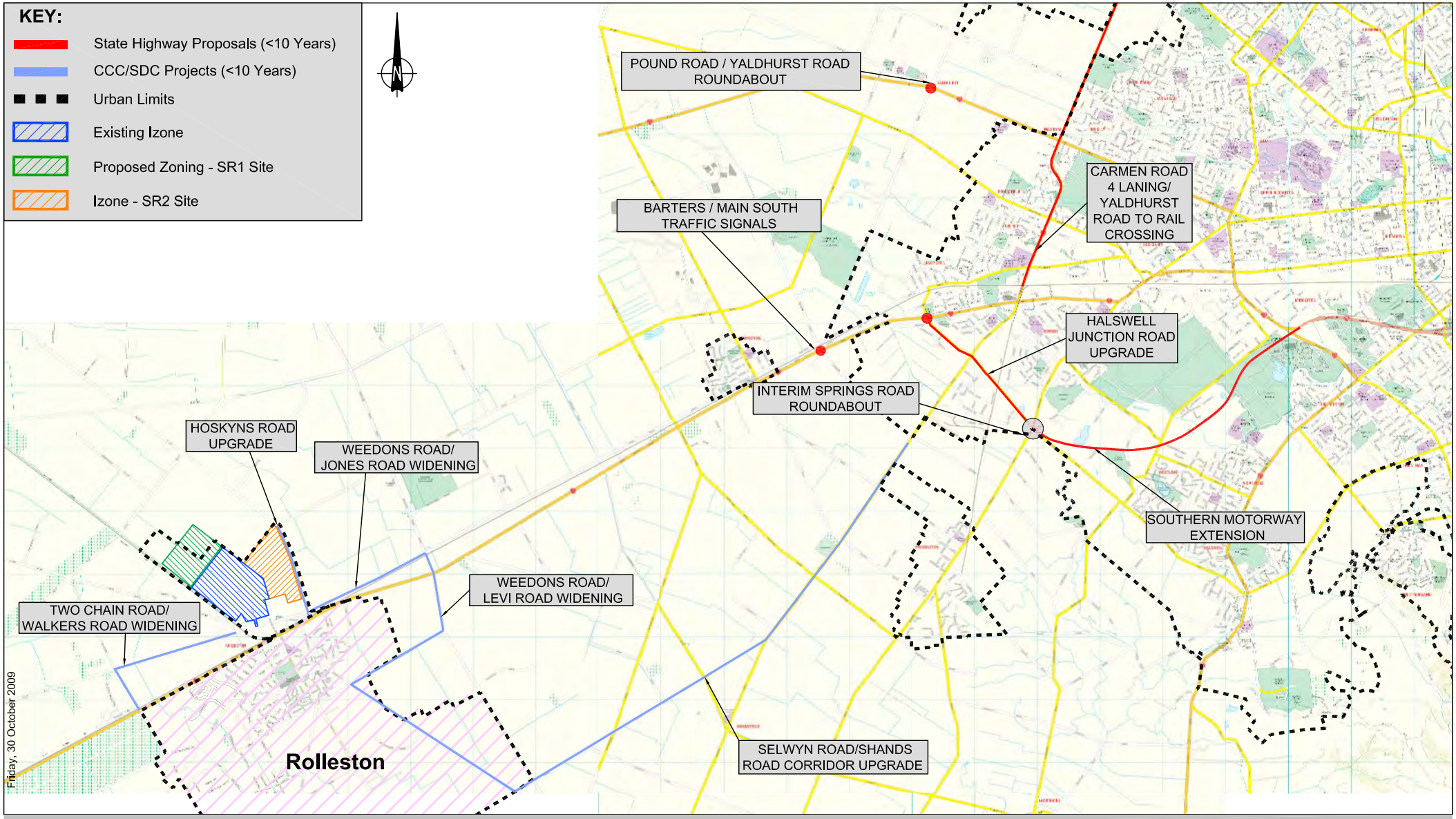
The key projects in the wider area include the completion of the Christchurch Southern Motorway Extension (Stage 2) which will connect to a four-lane section of SH1 south of Templeton. A full interchange is to be constructed at SH1/Weedons Ross Road within 11-20 years which will provide the main access point to Rolleston and IZONE. Vehicles will use new District Arterial routes formed by the upgraded sections of Weedons Road – Levi Road and Weedons Ross Road – Jones Road. Upgrades to the Rolleston – Hornby road corridor are proposed within a ten year timeframe 2007-2016, and a range of intersection improvements are also proposed in the next ten years to address capacity and safety issues.

Hoskyns Road is also to be upgraded to District Arterial status. This process has already commenced as part of Plan Change 5 with Selwyn District Council having proposed an upgrade to the section of Hoskyns Road between the new IZONE access and Jones Road, to be compatible with this future status.

The TRIP also includes planned improvements to the rail connections available to the IZONE site.

Widening of Dunns Crossing Road is envisaged to be included as part of the “Rolleston Arterial Roading and Intersection Upgrades” projects within TRIP, which are scheduled for construction within a 10 year timeframe.

These projects will further assist in the promotion of other modes of transport and improving the overall performance of the transport networks.



Rolleston Business Zone Expansion

Future Roading Projects (0 - 10 Years)

Traffic Design Group

14

SCALE: NTS

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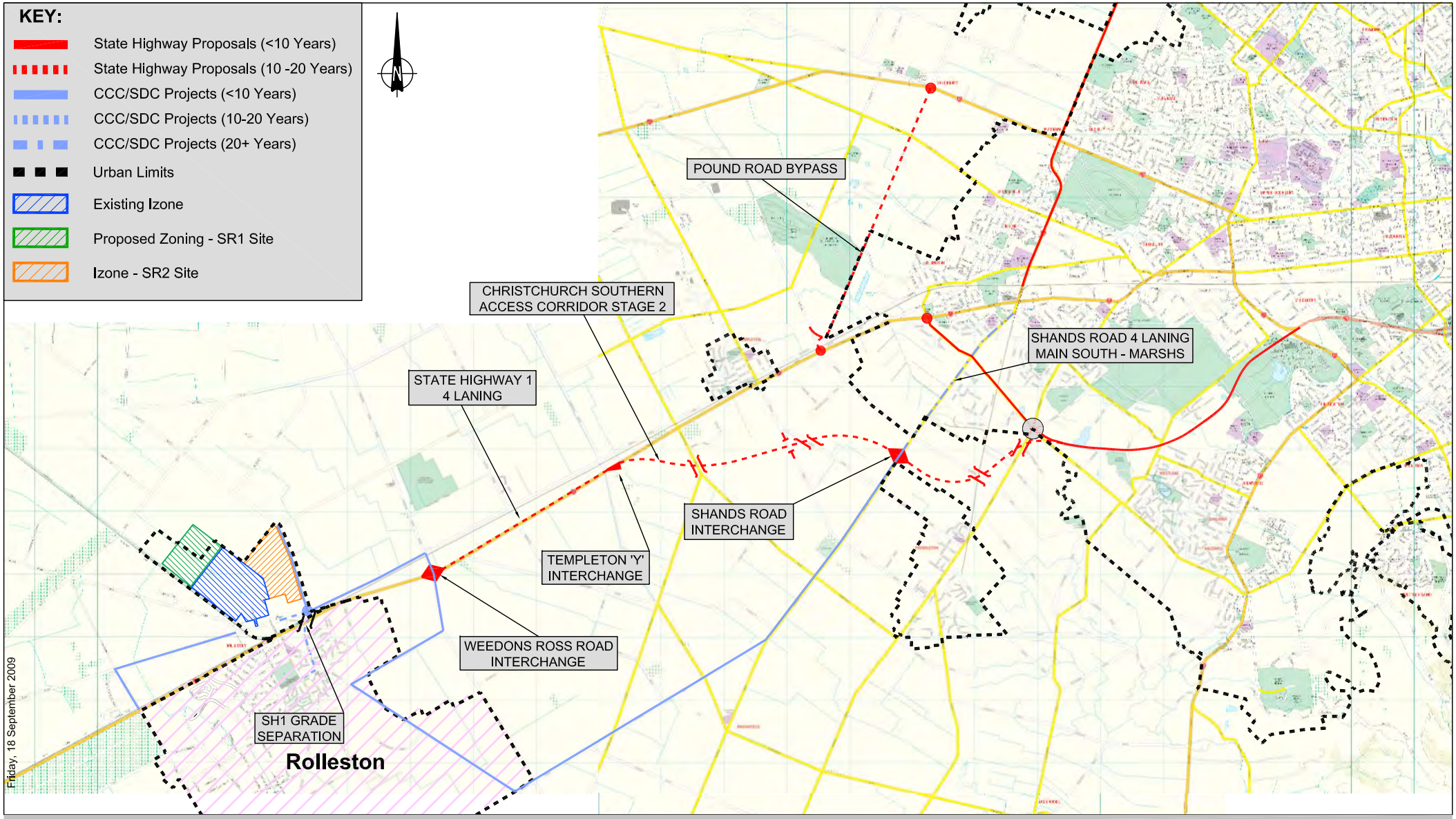

Rolleston Business Zone Expansion

Future Roading Projects (10+ Years)

Traffic Design Group

15

SCALE: NTS

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5.4 Canterbury Regional Land Transport Programme

The Canterbury Regional Land Transport Programme 2009-2019 (RLTP) has been developed by the Canterbury Regional Transport Committee (RTC) to bid for funding from the National Land Transport Fund. The RLTP provides coordination and a method for applying priorities to regional activities.

The RLTP outlines a three year programme of activities for the financial years 2009-2010, 2010-2011 and 2011-2012, and also gives a forecast of anticipated expenditure and funding sources for the 10 financial years from 2009-10 to 2018-19.

The principal projects for the roading network outlined in the RLTP for the next three financial years that affect IZONE are shown in Table 3.

COMPONENTS	RESPONSIBLE AGENCY
Prioritised Activities	
Christchurch Southern Motorway Extension Stage 1 – Property Purchase and Construction	NZTA
Halswell Junction Road Upgrade	CCC
SH1 – Tennyson Street Intersection Safety Improvement (Investigation and Design)	NZTA
CRETS Selwyn Roading Upgrade Projects	SDC
Christchurch Southern Motorway Extension Stage 2 – Halswell Junction Road to Waterholes Road (Investigation and Design)	NZTA
Barters/Main South Road (SH1) intersection improvement Traffic Signals	NZTA
Byron Street extension	SDC

Table 3: Projects RLTP Related to Plan Change Site

It can be seen that the respective agencies are committed to the construction of the first stage of the Southern Motorway Extension within the next three years and the development of a number of roading upgrade projects identified in CRETS. Table 3 also shows that the Investigation and Design stages of the Christchurch Southern Motorway Extension Stage 2 have also been allowed for.

5.5 Selwyn Community Plan (LTCCP)

The Selwyn Community Plan 2009 – 2019 has been developed by the Selwyn District Council to outline the activities and services the Council intends to provide over the next 10 years.

The major transportation projects identified for Rolleston are in Table 4:

Project	Years
Upgrade Lincoln/Rolleston Road and Selwyn Road and Shands Road to create an improved arterial link between Rolleston and Southern Christchurch.	2009 – 2012
Rolleston local road upgrades to cater for growth expected in residential and business areas.	2010 – 2016
Park n Ride public transport facilities at Rolleston	2014
Programme to progressively widen and seal narrow key roads such as Hoskyns Road, Jones Road, Weedons Road, Weedons Ross Road, Levi Road, Two Chain Road, Walkers Road and Dunns Crossing Road.	2012 – 2019
A 10 year programme to implement the Walking and Cycling Strategy Action Plan, including cycleways between Rolleston and Templeton, Lincoln and Rolleston plus individual cycle/footpath township projects.	2009 – 2019

Table 4: Major Transportation Projects for Rolleston in the Selwyn Community Plan

The key project within the next three years is the upgrade of Lincoln/Rolleston Road and Selwyn Road to Shands Road. This will provide an alternative route between Rolleston and Christchurch, reducing the reliance on trips via Main South Road which will in turn improve the available capacity of the State Highway. The Selwyn Road / Shands Road route will be conveniently located for the residential growth anticipated in the south of Rolleston and is consequently expected to attract a significant proportion of the traffic generated from these areas.

The provision of a Park and Ride facility and the implementation of projects outlined in the Walking and Cycling Action Plan will encourage the promotion of alternative transport modes and could potentially reduce traffic volumes on the road network.

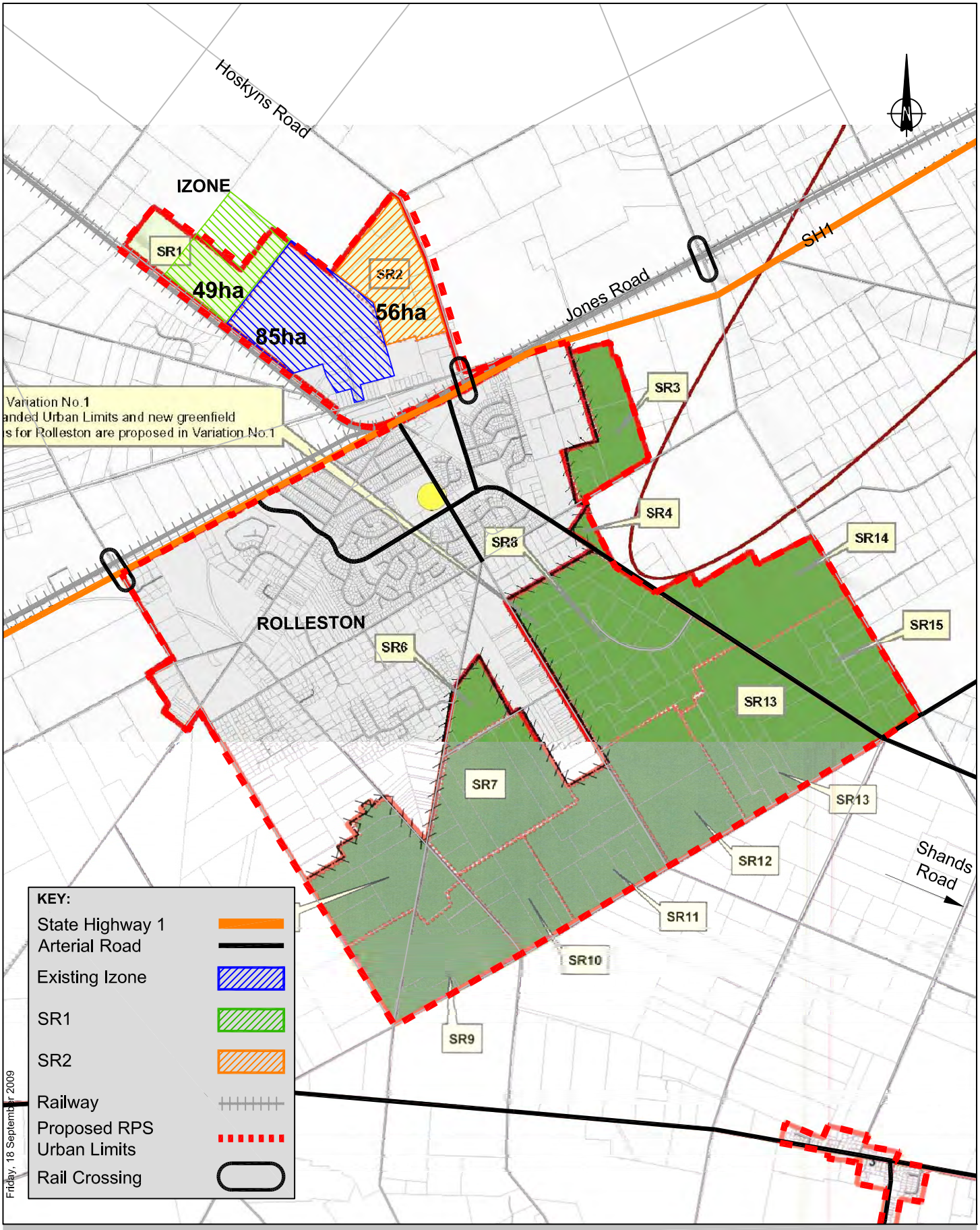
5.6 Urban Development Strategy (UDS)

The UDS has been developed over the last 5 years as a collaborative exercise between Environment Canterbury, Christchurch City Council, Selwyn District Council, Waimakariri District Council, and the NZ Transport Agency.

Proposed Change 1 (PC1) to the Regional Policy Statement is intended as the implementation of the UDS by primarily imposing an urban limit on existing urban areas in Selwyn District, Christchurch City and Waimakariri District.

The urban limits proposed by PC1 encompass the existing area of IZONE and the SR2 expansion approved through Plan Change 5 to Selwyn District Council's District Plan. They also encompass area SR1 as indicated in Figure 16.

SR1 involves an 'L' shaped piece of land for which it would be difficult to provide an efficient road network and which is less efficient for other servicing. Accordingly an alteration of SR1 to a rectangular shape is proposed as indicated previously in Figure 1.



Rolleston Business Zone Expansion

Urban Limits

Traffic Design Group

16

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6. Proposed Development

6.1 Outline Development Plan

Figure 17 shows the outline development plan (ODP) for the proposed expansion of the IZONE which includes a clearly defined and efficient road network that extends northwest from the existing IZONE network to cover the area of the proposed Plan Change. The block of land subject to this plan change application has a site area of 49ha. When combined with the 85ha of existing IZONE and the 56ha of SR2, the total proposed site area for the expanded IZONE is 190ha. The ODP allows for possible further extensions of the road network east of the Plan Change site to an additional area of rural land which has been identified for a potential future expansion of IZONE. The proposed road network allows for clear and efficient circulation within IZONE as well as convenient connection and integration with the surrounding road network including access from Railway Road.

Within the site, the primary connection to the existing road network will be provided via the boulevard roads which link with IZONE Drive and Hoskyns Road. The plan also shows the provision of additional connection points to the Plan Change area via secondary local business roads within existing Izone. The connections to the site from the existing road network allow for traffic to be distributed efficiently onto the existing network at more than one point. The structure of the new road network within the site is intended to be consistent with the existing IZONE roads in terms of the road layout, hierarchy, intersection form, and carriageway standards.

Footpaths are proposed on at least one side of all the roads within the development to ensure that the site is a pedestrian friendly environment, and wide carriageway widths provide a convenient environment for cyclists.

All new roads will have a posted speed limit of 50km/hr and it is proposed that the speed limit within the existing IZONE site should be reduced from 60km/h for consistency.

6.2 “Boulevard” Roads

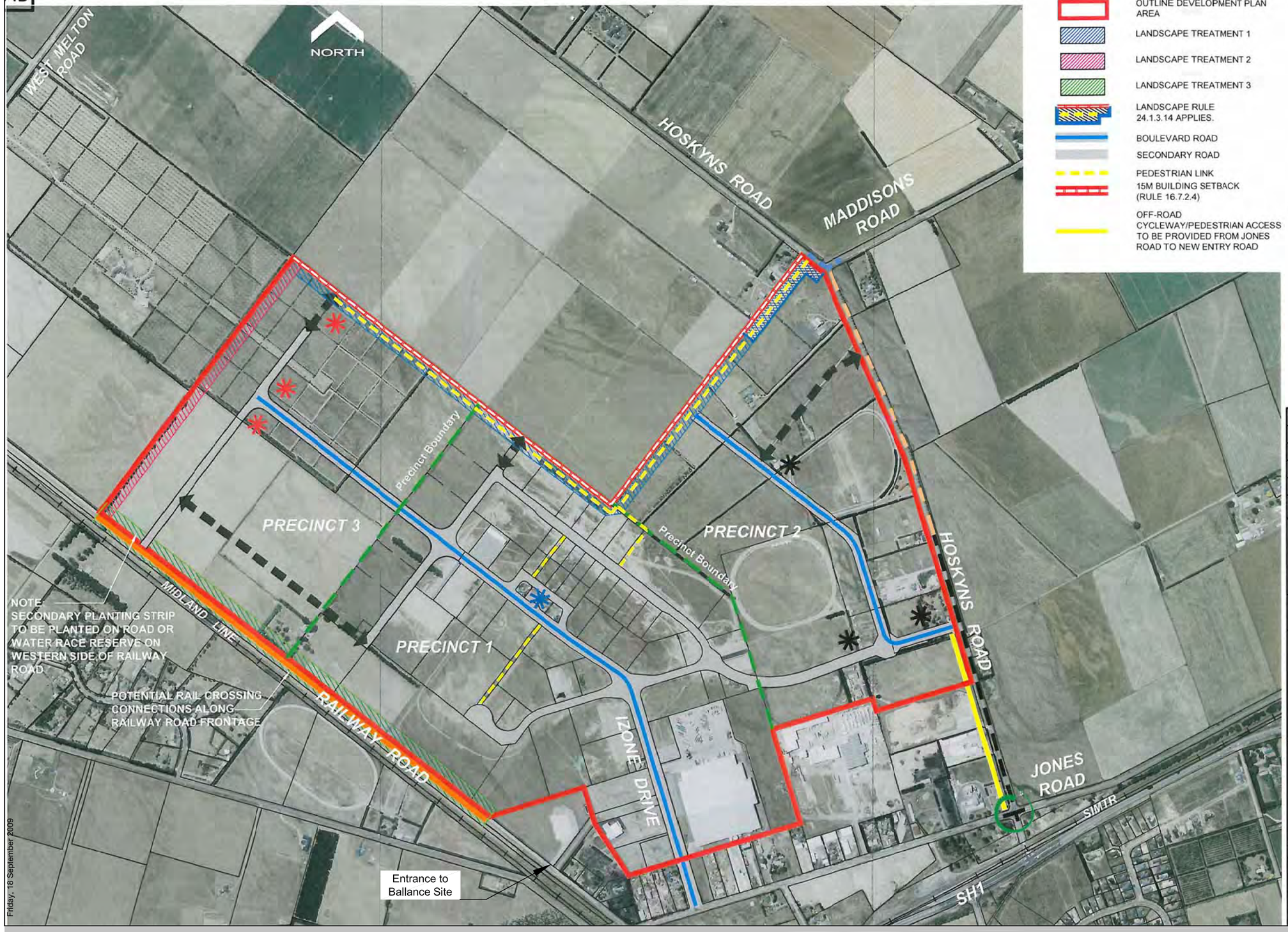
The Outline Development Plan for the site indicates that the existing Izone Drive boulevard road will be continued north in to the Plan Change site. It is proposed for the boulevard roads to comply with one of three general cross sections. Some variation may be applied to these cross sections at the detailed design level and this would be dealt with at the resource consent stage.

Of the three cross sections, outlined in Figure 18, the first two are essentially the same with two 6.0m wide lanes separated by a central median. The difference is that one cross section provides for a swale in the central median while the other allows for landscaping in the median and a swale drain on the side of the road. Landscaped berms will be provided on both sides of the carriageway along with a 2.0m wide footpath on one side of the carriageway.

The third cross section provides for a 13.5m wide two lane single carriageway. Again, landscaped berms will be provided on both sides of the carriageway along with a 2.0m wide footpath on one side of the carriageway.

These cross sections will readily accommodate truck movements on the “boulevard” roads within the development. Given the industrial/business nature of the zone, regular breaks will be provided on those roads in the central median to facilitate direct vehicle movements to and from major individual allotments. Elsewhere u-turns can be executed as necessary at the breaks in the median and at the roundabouts proposed at the main internal intersections.

A3



OUTLINE DEVELOPMENT PLAN AREA

LANDSCAPE TREATMENT 1

LANDSCAPE TREATMENT 2

LANDSCAPE TREATMENT 3

LANDSCAPE RULE 24.1.3.14 APPLIES.

BOULEVARD ROAD

SECONDARY ROAD

PEDESTRIAN LINK

15M BUILDING SETBACK (RULE 16.7.2.4)

OFF-ROAD CYCLEWAY/PEDESTRIAN ACCESS TO BE PROVIDED FROM JONES ROAD TO NEW ENTRY ROAD

Precinct 1 Precinct 2 Precinct 3

AMENITY HUB OPTIONS

HOSKYNS ROAD UPGRADE RULE 24.1.3.14)

ADDITIONAL CONNECTION IF POSSIBLE

POTENTIAL RAIL CROSSINGS

BALANCE HOSKYNS ROAD UPGRADE (RULE 24.1.3.17)

HOSKYNS/MADDISONS ROADS INTERSECTION UPGRADE (RULE 24.1.3.18)

JONES / HOSKYNS ROADS INTERSECTION UPGRADE (RULE 24.1.3.20)

NOTE : LOTS ABUTTING HOSKYNS ROAD SHOULD FRONT ONTO AND ACCESS HOSKYNS ROAD - REFER RULE 24.1.4.19

Rev.	Date	Revision Details	By
E	26.8.9	MINOR ADMENDMENTS	RS
D	26.6.9	OUTLINE DEV AREA ADJUSTED	RS
C	15.6.9	MINOR AMENDMENTS	RS
B	22.5.9	AMENDMENTS FROM H & G	RS
A	05.09	ISSUE	RS

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Project:

IZONE
SOUTHERN BUSINESS HUB

Drawing Title:

OUTLINE DEVELOPMENT PLAN BUSINESS 2A ZONE

PROPERTY DATA
The property data has been sourced from Land Informatio New Zealand (LINZ) and is current as at January 2009.

AERIAL PHOTO
The aerial photography was flown in January 2008 at a negative scale of approximately 1:27,500 & supplied courtesy of Selwyn District Council.

Friday, 18 September 2009

REVISION	DATE	DESCRIPTION

Rolleston Business Zone Expansion

Proposed Outlined Development Plan

DRAWN: DKN
DATE: 15-09-2009
SCALE: 1:10,000 @ A3
DWG NO:7030-6-C17B

Traffic Design Group

17

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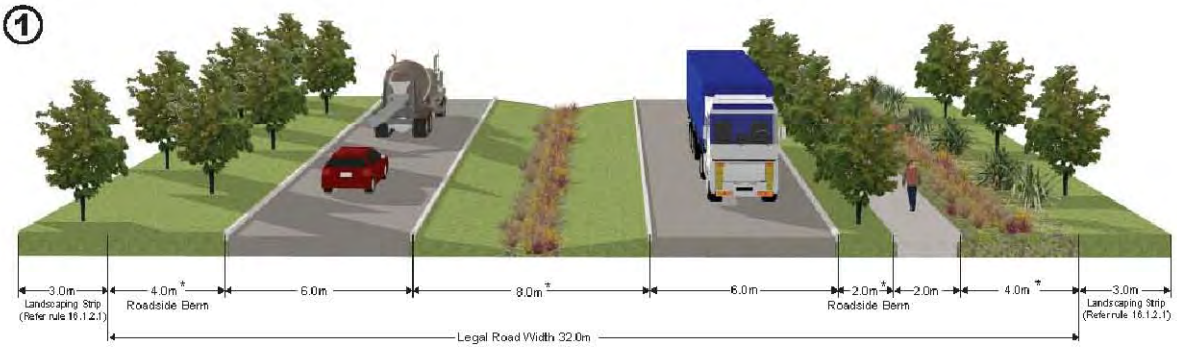
Recommended Road Cross Sections for the Business 2A Zone Rolleston (Refer Rule 24.1.3.11) - Boulevard Roads

Boulevard Road Options:

①



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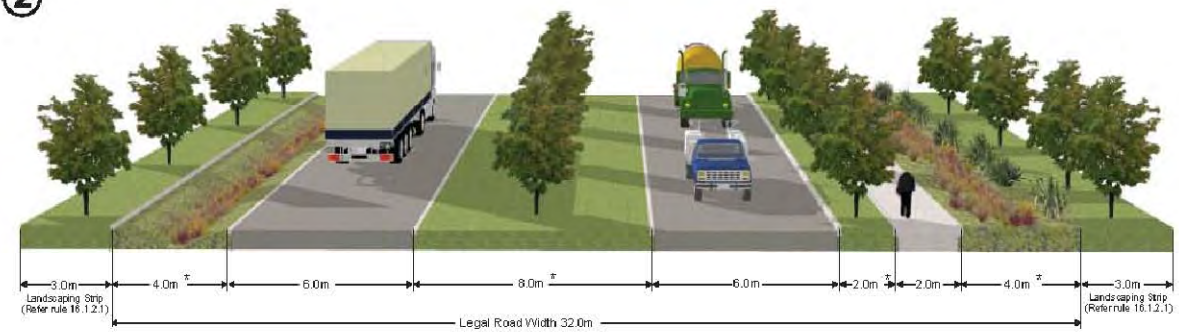

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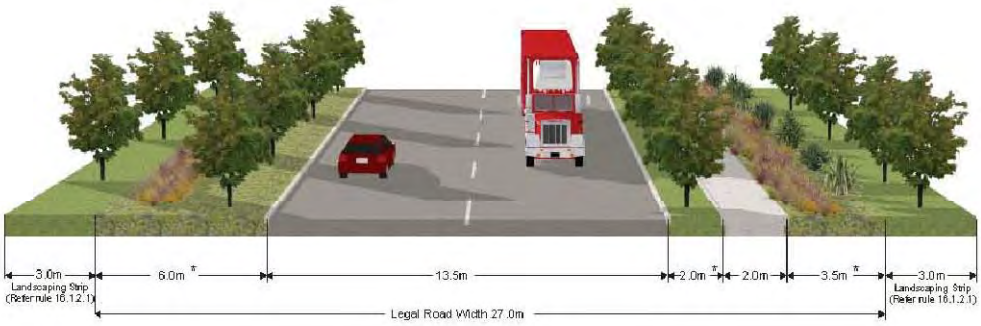

* = includes planting strip planting (Refer Rule 24.1.3.12)

Friday, 30 October 2009

Rolleston Business Zone Expansion

Recommended Road Cross Sections

Traffic Design Group

18

SCALE: NTS

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The boulevard roads provide the key gateways to the IZONE site and perform effectively as local business roads although designed to higher standards. They also allow for the expansion of the road network should land further to the north and the east be developed in the future. As gateways, the boulevards clearly define the access points for the development, which helps with the readability of the road network.

6.3 Local Business Roads

The secondary road network within the Plan Change site will consist of roads with a 12m wide, two lane, undivided carriageway. Again generous wide berms are provided on both sides of the road with a 2.0m wide footpath also provided on one side of the road.

Whilst these local business roads do not have the landscaping features of the primary roads, they will be of sufficient capacity to provide appropriate connections between the boulevards.

For the existing IZONE site and the expansion that will be facilitated by this Plan Change the boulevard roads will be connected to the local business roads by roundabouts at key locations. The roundabout connections will be designed to allow for safe and easy heavy vehicle manoeuvring.

Priority controlled intersections will also be used within the site to connect the boulevards and the local business roads where appropriate. These intersections will again be designed to allow for the safe and efficient movement of heavy vehicles.

6.4 External Connections

The primary external connections to the site will be via the existing IZONE Drive/Jones Road access and the future Hoskyns Road access to be formed as part of the development facilitated through the recently approved Plan Change 5 to the Selwyn District Plan.

In addition to the IZONE Drive/Jones Road and Hoskyns Road accesses, the Outline Development Plan allows for an access to the Plan Change area from Railway Road, approximately 1,500m north of Jones Road. Following the construction of this access the Selwyn District Council will look to close the section of Railway Road between the new access point and the entry to the Ballance Agri-Nutrients site, so that there will not be unnecessary road crossings at the sidings extending into IZONE.

At the proposed Railway Road access location there is ample sight distance as a result of the road's straight and flat alignment. Accordingly, and also due to the low traffic volumes, an intersection in the proposed location would be expected to operate safely and efficiently.

As noted above, the Selwyn District Council have indicated that Railway Road could be diverted into IZONE at this location with the section to the east being closed. In this case it would be desirable to provide a suitable radius bend and to seal the road to at least beyond the bend. This would require the addition of an appropriate corner splay to the ODP.

Railway Road is currently sealed for a distance of 230m north of Jones Road, beyond this point the carriageway is surfaced with loose gravel and it is this latter section that would be closed.

Currently SH1 and the Main Trunk railway line split the Rolleston urban area, with business land uses located to the north, and residential land uses located to the south. Most traffic currently uses the existing connection from SH1 via the intersection of Hoskyns Road and SH1 to access

IZONE. The Plan Change proposal does not include provision for any new connections between the two parts of Rolleston, but it is expected that the development of the south western sector of Rolleston will result in some motorists using Dunns Crossing Road, Walkers Road and Two Chain Road to access IZONE

In the longer term it is noted that the CRETS proposals indicate a grade-separated connection with a link from Rolleston Drive to Jones Road being provided over SH1. This link would effectively replace the existing connection between Rolleston and the IZONE which is currently provided by the two sets of traffic signals on SH1. Access to SH1 for travel to and from Christchurch would be provided by the interchange at Weedons Ross Road.

6.5 Pedestrians and Cyclists

The operation of the internal roading network has been specifically designed to incorporate the need of all road users including pedestrians and cyclists. In particular, the IZONE site includes a simple road network with pedestrian linkages, as shown on the Outline Development Plan in Figure 17, which have been designed to reduce travel distances within the site to encourage walking and cycling.

All internal roads will include footpaths on one side of the carriageway and wide traffic lanes have been designed to safely accommodate cycle movements, as indicated in Figure 18

Currently there are only moderate facilities for pedestrians and cyclists to travel between the Rolleston Township and IZONE. Existing pedestrian and cyclist infrastructure was described in Section 2.4 and 2.5 of this report.

In addition to the internal pedestrian and cyclist provisions within the site, there is a future proposal to upgrade Hoskyns Road to include an off-road pedestrian and cycle path along the western side, connecting between the end of the existing footpath and the proposed new IZONE access.

The long term intentions for the area outlined in CRETS include a grade-separated road connection over SH1 between Rolleston Drive and Jones Road which would allow for improved access to IZONE for cyclists and pedestrians thereby reducing the need for short trips by motor vehicles. CRETS also proposed a pedestrian / cyclist bridge across SH1 and the railway in the vicinity of Tennyson Street which would provide a further connection between the IZONE area and Rolleston.

6.6 Public Transport

While the proposed Plan Change rules cannot regulate for specific public transport services for IZONE, the design concept developed has been framed to support the introduction of such a service. The proposed internal road network has good connectivity and in accordance with Selwyn District Council recommendations regarding public transport, the internal road network will be of sufficient geometric and pavement strength standard to accommodate public transport vehicles and to allow routes to be provided through the area in the future. The Outline Development Plan for the site identifies that the roading pattern and the provision of wide roads enables numerous options for bus routes within the site.

In the long term it is envisaged that the bus service would utilise the proposed grade-separated connection across SH1 to provide for local trips between the Rolleston Township and IZONE, as well as for trips beyond Rolleston. It is noted that the RLTS includes provision for future Park and

Ride initiatives for Rolleston and a site has been identified next to the SDC offices, which could be associated either with future bus services or rail services.

The majority of the IZONE site is conveniently located within walking distance to the railway lines and the Rolleston rail station. Although there are currently no passenger rail services on these lines there is the potential for rail services to be introduced in the future. Consequently, the IZONE site is well located to take advantage of these services should they be established.

6.7 Railway Siding

The ODP for the Plan Change site (Figure 17) shows the potential for a rail siding to be constructed adjacent to Railway Road, providing a connection to the Midland railway line. There is also the potential for the rail siding to extend further into the site in the future should this be required.

The National Rail Strategy (NRS) falls under the umbrella of the New Zealand Transport Strategy and focuses upon the particular issues relevant to the rail network. It describes the government's commitment to retain the existing network, investigate the development of new railway lines, and maximise the use of rail transport, including encouraging more freight to be carried by rail. The provision of a rail siding will contribute to the achievement of these objectives.

The Regional Land Transport Strategy outlines a number of policies that support and encourage the use of rail for both public transport and the movement of freight and has committed to ongoing investigation of the greater use of rail for transportation of freight in the region.

7. Proposed Transportation Enhancements

7.1 Hoskyns Road Upgrade

Under the CRETS proposals it is intended that Hoskyns Road be upgraded between SH73 and Jones Road to a District Arterial standard.

As part of the future development facilitated through the recently approved Plan Change 5 to the Selwyn District Plan, it is proposed to upgrade the section of Hoskyns Road from the Jones Road/Hoskyns Road intersection to and beyond the proposed new IZONE access to Hoskyns Road (see Figure 19) to provide an appropriate standard of access, parking and pedestrian and cycle provision for the proposed development.

The proposed cross section which has an overall width of 10m includes two 3.5m wide traffic lanes, a 2.5m wide parking lane on the western side and a 0.5m wide sealed shoulder on the eastern side. It is also proposed to provide a 2m wide off-road cycle/pedestrian path on the western side of Hoskyns Road.

On the eastern side of Hoskyns Road there is undeveloped rural land which is separated from the carriageway by a 3.5m wide berm that includes a water race. It is proposed that this side of the road reserve will generally remain the same except at the new intersection for the access to IZONE and on the northern Hoskyns Road approach to the Jones Road intersection which will be upgraded to accommodate additional traffic lanes required for the proposed roundabout. The proposed design of the Hoskyns Road / Jones Road intersection is shown in Figure 20.

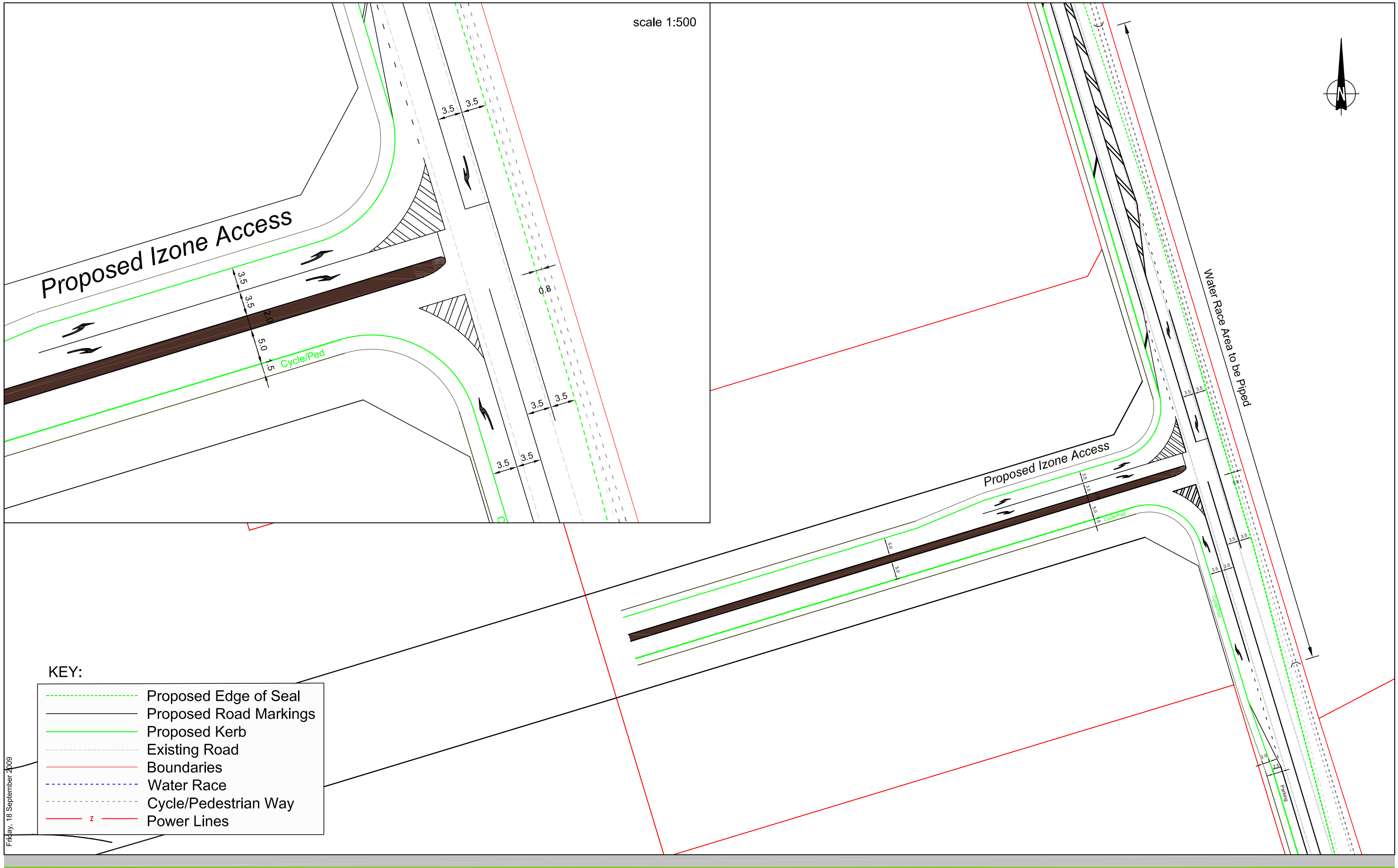
At present all access to the IZONE site is via the IZONE Drive/Jones Road intersection. Review of Figure 17 indicates that it is likely that as the new areas are occupied the focus for access to IZONE will move away from Jones Road and towards Hoskyns Road.

7.2 Hoskyns Road / Maddisons Road Intersection Upgrade

The intersection of Hoskyns Road and Maddisons Road has painted centrelines on all approaches, a chevron board facing Maddisons Road and advisory speed signs showing 55km/h on Hoskyns Road. The existing form of this intersection is shown in Photograph 9 below.

Photograph 9: Hoskyns Road / Maddisons Road Intersection (Looking North along Hoskyns)

scale 1:500



Friday, 18 September 2009

REVISION	DATE	DESCRIPTION

Rolleston Business Zone Expansion

Proposed Hoskyns Road Access

DRAWN: DKN
DATE: 27-07-08
SCALE: 1:1000 @ A3
DWG NO:7030-6-C19A

Traffic Design Group

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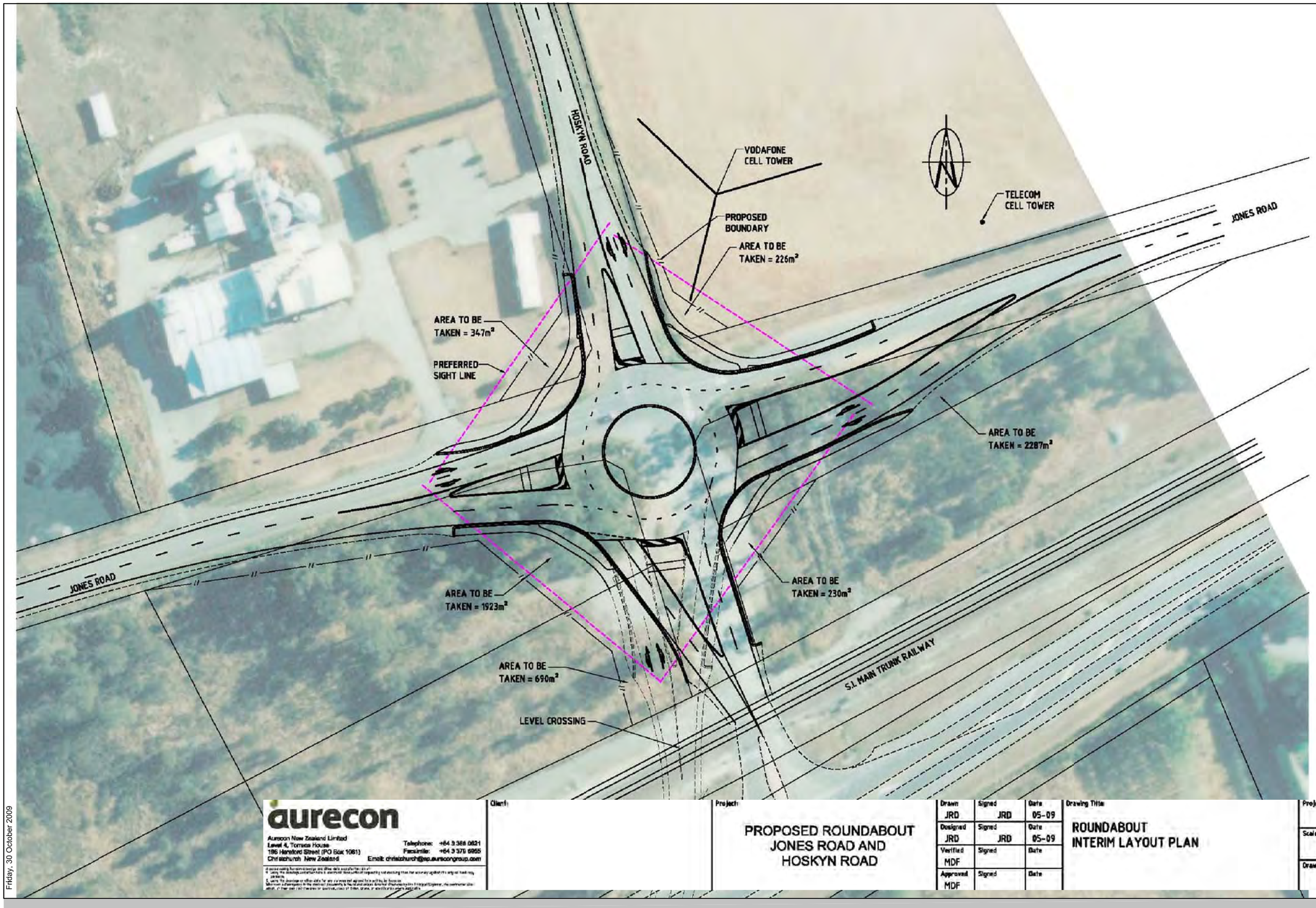

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Client:

Project: PROPOSED ROUNDABOUT JONES ROAD AND HOSKYN ROAD

Drawn JRD	Signed JRD	Date 05-09	
Designed JRD	Signed JRD	Date 05-09	
Verified MDF	Signed	Date	
Approved MDF	Signed	Date	

Drawing Title: ROUNDABOUT INTERIM LAYOUT PLAN

Project No. 21284-70
Scale 1:500
Sheet Size A1
Drawing No. C20-02
Rev. 01

Friday, 30 October 2009

REVISION	DATE	DESCRIPTION

Rolleston Business Zone Expansion

Proposed Roundabout Jones Road and Hoskyn Road

DRAWN: DKN
DATE: 30-10-2009
SCALE: 1:1,000 @ A3
DWG NO:7030-6-C20B

Traffic Design Group

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As part of the recently approved Plan Change 5, the intersection of Hoskyns Road and Maddisons Road will be upgraded to include a Give Way sign and painted limit lines on Maddisons Road with the future expansion of IZONE on the SR2 site. It is understood that the trees and some vegetation on the north east corner of the intersection have been removed to improve visibility. These improvements are proposed in the interests of road safety.

Traffic volumes on Maddisons Road are being monitored to check whether the traffic, particularly trucks, using the road increases as IZONE is developed.

7.3 Hoskyns Road / Jones Road Intersection Upgrade

Under the CRETS proposals the long-term future of the Jones Road/Hoskyns Road intersection was as a two-lane roundabout. The analysis presented for the recently approved Plan Change 5 demonstrated that a roundabout was not required by development of SR2 and that sufficient capacity would be provided by an upgraded priority intersection. However, subsequent sections of this report demonstrate that with the additional traffic generated from development of the Plan Change 10 area, an upgraded priority intersection will no longer provide sufficient capacity and therefore a roundabout, as originally proposed under CRETS, will be required.

The proposed upgrade, which is shown in Figure 20, has been designed to enhance capacity of this intersection and provide for the needs of pedestrians.

Confirmation that this intersection layout has sufficient capacity to accommodate the expected traffic demands at the year 2021 at an acceptable level of service is provided in later sections of this report.

The safety of the roundabout has been assessed by an internal safety audit. This has identified a minor concern regarding the separation between this intersection and the railway level crossing. This concern was due to the potential for traffic to queue back from the roundabout and conflict with rail operations. The safety audit identified possible treatments in marking and escape routes that would mitigate this concern. There is the also the potential for warning signal systems if traffic flows and increased delays reached a point where queuing across the level crossing became a common occurrence.

8. Traffic Generation and Distribution

8.1 Traffic Generation

It is anticipated that the IZONE expansion proposed by this Plan Change will be developed and be fully occupied by about 2016.

Analysis of the traffic generation for the previously approved Plan Change 5 (SR2) site at IZONE was carried out using the land-use projections and generation rates adopted for the CRETS modelling. Updated analysis was recently carried out for IZONE Planning Group's submission to Proposed Change 1 to the Regional Policy Statement, because that analysis assessed the effect of developing a large area of additional land outside the proposed urban limits.

For this assessment, the recently updated Christchurch Transportation Model (CTM) has been applied. The CTM is a strategic four stage land-use driven transportation model, which applies mathematical relationships to estimate trip generation, modal split, trip distribution and assignment (route choice) for the Greater Christchurch area. The model has a 2006 validated base and can provide forecast traffic patterns for any future year from input demographic land-use data. The CTM is the successor of the previous model from which CRETS was a derivative. The analysis for this Plan Change application also considered the previous analysis carried out for IZONE but updated it to assess the anticipated level of traffic generated from the future IZONE development facilitated by this plan change using the CTM.

It is widely accepted that traffic generation for most types of land use does not increase linearly with size and this applies particularly for IZONE which is at the larger end of the scale in terms of a single site. This is due to the fact that as the size of the IZONE site increases there will be a greater degree of trip linking and internal trips. Therefore, for both the morning and evening peak hours, the external traffic generation rate is expected to decline as the overall size of the business park increases.

A summary of the traffic generation rates of the expanded IZONE site, which includes the existing IZONE, SR1 and SR2, is provided in the following table with the rates being those for the total site area.

TOTAL SITE AREA	**190 HECTARES**	
Time Period	**AM Peak**	**PM Peak**
Traffic Generation Rate	6.6 vph/ha	6.3 vph/ha
Traffic Generation	1,247 vph	1,203 vph

Table 5: IZONE Traffic Generation

The traffic generation of the fully developed, extended IZONE is hence predicted to be approximately 1,247vph in the morning peak, 1,203vph in the evening peak (in + out).

8.2 Traffic Distribution

The traffic distribution for the site was produced by the Christchurch Transportation Model, which takes into consideration the location of the site with respect to the surrounding residential centres, the strategic road network, and proposed future roading projects.

The projected residential growth for Rolleston also has a significant effect on the distribution of trips to and from IZONE. As the land area of IZONE increases it is expected that not only will an increasing proportion of trips generated by the development remain internal to IZONE but an increasing proportion will also remain within Rolleston.

The directional split determined from the analysis shows that approximately 80% enter IZONE and 20% exit IZONE during the morning peak, while during the evening peak these proportions are 30% entering and 70% exiting. These spits have been adopted in the analysis of the expansion of the IZONE site facilitated by this Plan Change.

The predicted distribution of trips to and from the expanded IZONE business park at full development are shown in Table 6 for both the morning and evening peaks.

	PERCENTAGE OF TRIPS	
Leaving IZONE	**AM**	**PM**
To East (Rolleston)	11%	21%
To North (Christchurch)	68%	56%
To West (Hoskyns Road)	10%	12%
To South	11%	11%
Entering IZONE	**AM**	**PM**
From East (Rolleston)	19%	18%
From North (Christchurch)	58%	56%
From West (Hoskyns Road)	13%	14%
From South	10%	12%

Table 6: Traffic Distribution of IZONE

As can be seen, the majority of the trips generated by IZONE in the peak periods are expected to be linked with Christchurch and then Rolleston.

9. Traffic Assessment

9.1 General

The majority of the traffic generated by the development enabled by the proposed expansion of IZONE will utilise SH1 for travel to/from Christchurch and Rolleston, therefore the greatest potential effect of the development is its effect on the operation of the SH1 intersections with Hoskyns Road and Rolleston Drive, and also the Jones Road / Hoskyns Road intersection. Ultimately with the second stage of the Christchurch Southern Motorway (CSM2) to the interchange at Weedons Ross Road, and with SH1 grade-separation at Hoskyns Road and Rolleston Drive, movements between IZONE and Rolleston will avoid SH1. However a significant proportion of the IZONE traffic will then utilise Jones Road to travel to and from Christchurch which will affect the operation of the Jones Road / Hoskyns Road intersection.

The intersections of SH1 / Hoskyns Road and SH1 / Rolleston Drive are closely spaced, resulting in a high level of traffic interaction, therefore analysis of the intersections using the SIDRA program is considered unsuitable and the operation of the intersections has been assessed using microscopic simulation modelling.

The microscopic simulation models have been developed using S-PARAMICS software. Simulation represents traffic flow within a network by simulating individual vehicles and their interactions with other vehicles and the roading environment. As with real traffic conditions, these modelled interactions are probabilistic and vary each time the model is run. To obtain statistically meaningful results, all network performance measures included in this report are averaged from five simulation runs.

The modelling process involved developing calibrated base models of the network for the weekday morning and evening peak periods which were then used to test traffic demand changes associated with development of the proposed zone expansion.

The future demands forecast by the strategic transportation model (CTM) have been extracted and input to the microsimulation model to enable a detailed operational assessment of the network.

9.2 SH1 Capacity

SH1 currently carries a two-way daily volume of 18,300 vpd on the section immediately south of Weedons Ross Road, north of Rolleston. The practical capacity of the two-lane SH1 carriageway is approximately 26,000vpd, or 2,600vph, although this will vary depending on tidality and the length of the peak period. Figure 21 shows the extrapolated trend line for SH1 traffic volumes north of Rolleston between 1990 and 2008. This has been indicated for comparative purposes with the future patterns expected for residential development and business development in Rolleston and Izone. The profile of future residential growth was based on the sequencing included in Variation 1 of the Proposed Change 1 to the RPS as modified by the proposed structure plan for Rolleston. The employment growth pattern is based on projected development at Izone. As can be seen, the current trend for traffic on SH1 indicates that SH1 north of Rolleston could reach capacity in 2019. However, it is anticipated that the future growth in employment at Izone will reduce the need for Rolleston residents to travel to work in Christchurch and that this, together with the alternative capacity provided by the Selwyn / Shands Road upgrade, will extend the effective life of the existing SH1 until at least 2021. It is also anticipated

that the development of a secondary local roading alternative to SH1 via Shands Road, Selwyn Road and Lincoln-Rolleston Road will further reduce traffic volumes on SH1 and extend the life of SH1.

Following 2021 it is anticipated that both Stage 2 of the Christchurch Southern Motorway and the SH1 four-laning (Weedons Ross Road to Waterholes Road) will have been constructed – massively increasing SH1 capacity north of Rolleston to 74,000vpd. Consequently, the critical assessment year for this application is determined to be 2021, without the capacity increase on SH1.

The results of this analysis show that in 2021, with full development of IZONE, the peak hour traffic volumes on SH1 north of Rolleston are anticipated to be 2,700vph during the morning peak and 2,750vph during the evening peak. Accordingly, SH1 is expected to operate near capacity with the full development of IZONE as expanded by this plan change.

9.3 Modelled Scenarios

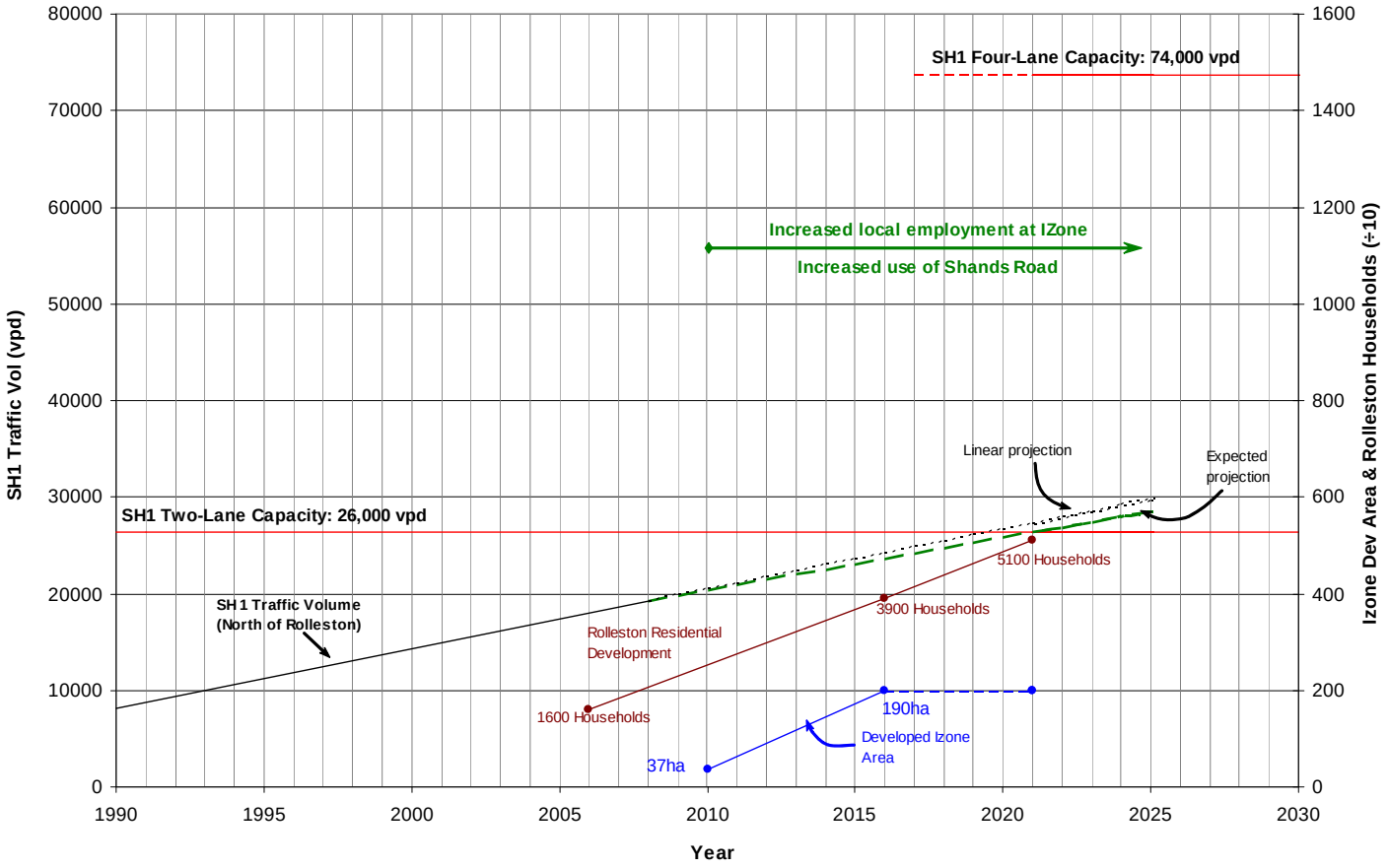
The simulation models developed to assess the effects of this proposed Plan Change to the existing IZONE business park have been designed to evaluate the effects of full development of the area including the original IZONE, SR1 and SR2. The models assess the performance of the future road network with the traffic generated by the full development of the expanded IZONE site and other traffic predicted for the 2021 peak hours.

Two future models were developed. The first was a model for 2021 which includes the signalised intersections on SH1, excludes the grade-separated connection between Jones Road and Rolleston Drive or any of the other proposals associated with Stage 2 of the Southern Motorway. This model also includes the upgrades of Hoskyns Road proposed as part of Plan Change 5 and the improvement of the Hoskyns Road / Jones Road intersection. This model has been referred to as “Without CSM2” (Without Christchurch Southern Motorway Stage 2).

The second model is also for 2021 but it takes in the proposals recommended by CRETS which include the grade-separated connection between Jones Road and Rolleston Drive, a full diamond interchange at the Weedons Road / SH1 intersection, Stage 2 of the Southern Motorway and four-laning of SH1 north of the Weedons Road interchange. It also includes a roundabout at Jones Road / Hoskyns Road intersection as recommended by CRETS. This model has been referred to as “With CSM2”.

9.4 Traffic Capacity Analysis

The various simulation model scenarios were used to determine the delays experienced by vehicles in the vicinity of IZONE. In order to provide thresholds for acceptable intersection performance against which to assess the development traffic effects, reference has been made to the Canterbury Regional Land Transport Strategy (RLTS). The RTLS defines the minimum level of service (LOS) that should be maintained within the strategic road network (LOS D outside Christchurch). LOS measures range from LOS A which is free flow conditions to LOS F where traffic flow has broken down. The performance measures for LOS are taken from the Highway Capacity Manual (HCM) and are based on average delay for vehicles at intersections.



Friday, 30 October 2009

Rolleston Business Zone Expansion

Izone Development Area & Rolleston Households

Traffic Design Group

21

SCALE: NTS

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The effects of the development proposal on the key intersections through the study area have been assessed by using the simulation models with the AM and PM peak periods. The output results are summarised in the following sections, firstly for the critical scenario "Without CSM2", followed by the "With CSM2" situation.

9.4.1 Without CSM2

9.4.1.1 SH1 / Rolleston Drive Intersection

The signalised intersection of Main South Road (SH1) / Rolleston Drive provides the most direct link from Rolleston to IZONE. The results of the simulation analysis for the SH1 / Rolleston Drive intersection are shown in the table below.

Signalised Intersection of SH1 and Rolleston Drive		Volume (vph)	Movement		Approach		Intersection	
			Avg. delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS
2021 AM Peak (7:30-8:30AM)								
SH1 South Approach	Right Through	47 815	37 57	D E	56	D	32	C
Rolleston Drive	Left Right	39 745	8 17	A B	17	B		
SH1 North Approach	Left Through	37 914	3 25	A C	24	C		
2021 PM Peak (5:00-6:00PM)								
SH1 South Approach	Right Through	36 635	18 12	B B	12	B	12	B
Rolleston Drive	Left Right	15 241	5 26	A C	25	C		
SH1 North Approach	Left Through	153 1116	5 10	A A	9	A		

Table 7: SH1 / Rolleston Drive Intersection Performance (2021)

As shown in Table 7 the SH1 / Rolleston Drive intersection will continue to offer a high level of service with the overall intersection operating at LOS C during the AM peak and LOS B during the PM peak with the full development of the expanded IZONE as proposed by the plan change. The worst approach in terms of level of service is SH1 South in the morning peak which experiences a level of service of D. This meets the recommended minimum level of service guidelines of the Regional Land Transport Strategy for a strategic urban road.

9.4.1.2 SH1 / Hoskyns Road Intersection

The signalised intersection of Main South Road (SH1) / Hoskyns Road provides the most direct link from SH1 to IZONE. The results of the simulation analysis for the SH1 / Hoskyns Road intersection are shown in the following table.

Signalised Intersection of SH1 and Hoskyns Road		Volume (vph)	Movement		Approach		Intersection	
			Avg. delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS
2021 AM Peak (7:30-8:30AM)								
SH1 South Approach	Left Through	346 1,204	36 49	D D	46	D	30	C
Hoskyns Road	Left Right	195 108	9 35	A C	18	B		
SH1 North Approach	Right Through	450 837	21 10	C A	14	B		
2021 PM Peak (5:00-6:00PM)								
SH1 South Approach	Left Through	115 760	7 25	A C	23	C	19	B
Hoskyns Road	Left Right	381 363	13 16	B B	14	B		
SH1 North Approach	Right Through	82 909	26 20	C B	20	B		

Table 8: SH1 / Hoskyns Road Intersection Performance (2021)

Table 8 shows that the SH1 / Hoskyns Road intersection will offer a high level of service with all movements experiencing Level of Service D or better and the overall intersection operating at LOS C during the AM peak and LOS B during the PM peak.

9.4.1.3 Jones Road / Hoskyns Road Intersection

As identified earlier, the additional traffic anticipated as a result of development facilitated by this plan change would require that the Jones Road / Hoskyns Road intersection be upgraded, with CRETS recommending a roundabout. The results of the simulation analysis for a roundabout at the Jones Road /Hoskyns Road intersection are shown in Table 9.

Roundabout at Hoskyns Road and Jones Road		Volume (vph)	Movement		Approach		Intersection	
			Avg. delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS
2021 AM Peak (7:30-8:30AM)								
Hoskyns Road South Approach	Left Through Right	261 413 57	5 4 8	A A A	5	A	8	A
Jones Road East Approach	Left Through Right	59 53 82	28 7 7	C A A	13	B		
Hoskyns Road North Approach	Left Through Right	62 113 6	2 21 4	A C A	14	B		
Jones Road West Approach	Left Through Right	2 29 57	2 6 7	A A A	7	A		
2021 PM Peak (5:00-6:00PM)								
Hoskyns Road South Approach	Left Through Right	62 95 37	4 3 6	A A A	4	A	18	B
Jones Road East Approach	Left Through Right	106 18 47	44 43 49	D D D	45	D		
Hoskyns Road North Approach	Left Through Right	33 386 2	3 22 7	A C A	20	B		
Jones Road West Approach	Left Through Right	4 32 244	2 4 7	A A A	7	A		

Table 9: Hoskyns Road / Jones Road Intersection Performance (2021)

Table 9 demonstrates that the upgraded Jones Road / Hoskyns Road intersection will efficiently provide for full development demands during the 2021 AM and PM peak periods. All movements experience LOS D or better. The highest delays (LOS D) are experienced on the Jones Road approaches to the intersection in the PM peak, however, the overall intersection will provide LOS A during the AM peak and LOS B during the PM peak, satisfying the RLTS requirement for this situation.

9.4.1.4 Site Access Intersections

The simulation analysis clearly demonstrated that the existing site access intersections on Jones Road and Hoskyns Road will provide efficiently for full development demands in 2021. These intersections will be “Stop” sign controlled with Jones Road and Hoskyns Road having priority. The AM and PM peak performances for the Jones Road / IZONE Drive intersection and the site access intersection on Hoskyns Road are summarised below in Tables 10 and 11.

Priority Controlled Intersection of Jones Road and Izone Drive		Volume (vph)	Movement		Approach		Intersection	
			Avg. delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS
2021 AM Peak (7:30-8:30AM)								
Jones Road West Approach	Left Through	53 28	8 2	A A	6	A	4	A
IZONE Drive Approach	Left Right	61 15	2 4	A A	2	A		
Jones Road East Approach	Right Through	297 23	4 1	A A	4	A		
2021 PM Peak (5:00-6:00PM)								
Jones Road West Approach	Left Through	24 99	2 1	A A	1	A	3	A
IZONE Drive Approach	Left Right	182 22	4 5	A A	4	A		
Jones Road East Approach	Right Through	69 13	3 1	A A	3	A		

Table 10: Jones Road / IZONE Drive Intersection Performance (2021)

Priority Controlled Intersection of Hoskyns Road and Site Access Road		Volume (vph)	Movement		Approach		Intersection	
			Avg. delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS
2021 AM Peak (7:30-8:30AM)								
Hoskyns Road South Approach	Left Through	492 2	13 1	B A	13	B	10	A
Site Access Road Approach	Left Right	7 159	3 6	A A	6	A		
Hoskyns Road North Approach	Right Through	43 22	4 2	A A	3	A		
2021 PM Peak (5:00-6:00PM)								
Hoskyns Road South Approach	Left Through	125 24	4 1	A A	4	A	5	A
Site Access Road Approach	Left Right	34 401	3 6	A A	6	A		
Hoskyns Road North Approach	Right Through	12 29	3 1	A A	2	A		

Table 11: Hoskyns Road / Site Access Road Intersection Performance (2021)

As can be seen in the above tables both access points are expected to operate at an excellent level of service (LOS B or better) during both peak hour periods, which exceeds the RLTS requirements.

Analysis has not been carried out for the potential access to Railway Road because it is anticipated that an access in this location would attract very few vehicle movements. Given the existing low traffic volume on Railway Road the access would therefore achieve a high level of service.

9.4.2 With CSM2

9.4.2.1 Jones Road / Hoskyns Road Intersection

The results of the simulation analysis for the roundabout at the intersection of Jones Road and Hoskyns Road are shown in the table below.

Roundabout at Hoskyns Road and Jones Road		Volume (vph)	Movement		Approach		Intersection	
			Avg. delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS
2021 AM Peak (7:30-8:30AM)								
Hoskyns Road South Approach	Left Through Right	184 183 334	10 10 19	A A B	14	B	12	B
Jones Road East Approach	Left Through Right	28 193 264	4 10 11	A A B	10	A		
Hoskyns Road North Approach	Left Through Right	141 25 1	11 9 5	B A A	11	A		
Jones Road West Approach	Left Through Right	5 52 35	4 11 19	A B B	14	B		
2021 PM Peak (5:00-6:00PM)								
Hoskyns Road South Approach	Left Through Right	17 10 47	3 2 6	A A A	5	A	18	B
Jones Road East Approach	Left Through Right	12 28 22	7 8 10	A A A	9	A		
Hoskyns Road North Approach	Left Through Right	83 35 0	42 29 0	D C A	38	D		
Jones Road West Approach	Left Through Right	1 44 43	1 6 10	A A A	8	A		

Table 12: Hoskyns Road / Jones Road Intersection Performance (2021)

Table 12 demonstrates that a roundabout at the Jones Road / Hoskyns Road intersection will efficiently provide for full development demands under the "With CSM2" scenario during the 2021 AM and PM peak periods. The overall intersection will provide LOS B during both the AM and PM Peaks, satisfying the RLTS requirements The worst approach is Hoskyns Road North in the PM peak, which has an average delay of 38 seconds per vehicle, only just exceeding the level of service C threshold by 3 seconds.

9.4.2.2 Site Access Intersections

The simulation analysis clearly demonstrated that the site access intersections on Jones Road and Hoskyns Road will provide efficiently for full development under the "With CSM2" scenario. These accesses will be "Stop" sign controlled with Jones Road and Hoskyns Road having priority. The AM and PM peak performance for the existing Jones Road / IZONE Drive intersection and the proposed site access intersection on Hoskyns Road are summarised below in Tables 13 and 14.

Priority Controlled Intersection of Jones Road and Izone Drive		Volume (vph)	Movement		Approach		Intersection	
			Avg. delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS
2021 AM Peak (7:30-8:30AM)								
Jones Road West Approach	Left Through	56 32	14 4	B A	10	A	5	A
IZONE Drive Approach	Left Right	60 15	2 7	A A	3	A		
Jones Road East Approach	Right Through	362 16	4 1	A A	4	A		
2021 PM Peak (5:00-6:00PM)								
Jones Road West Approach	Left Through	8 31	5 1	A A	2	A	3	A
IZONE Drive Approach	Left Right	60 7	3 5	A A	3	A		
Jones Road East Approach	Right Through	38 7	3 1	A A	3	A		

Table 13: Jones Road / IZONE Drive Intersection Performance (2021)

Priority Controlled Intersection of Hoskyns Road and Site Access Road		Volume (vph)	Movement		Approach		Intersection	
			Avg. delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS
2021 AM Peak (7:30-8:30AM)								
Hoskyns Road South Approach	Left Through	448 4	8 1	A A	8	A	7	A
Site Access Road Approach	Left Right	7 165	3 5	A A	5	A		
Hoskyns Road North Approach	Right Through	44 1	4 1	A A	4	A		
2021 PM Peak (5:00-6:00PM)								
Hoskyns Road South Approach	Left Through	29 6	4 1	A A	4	A	4	A
Site Access Road Approach	Left Right	10 125	4 4	A A	4	A		
Hoskyns Road North Approach	Right Through	3 5	3 1	A A	2	A		

Table 14: Hoskyns Road / Site Access Road Intersection Performance (2021)

The above tables show that both access points are expected to operate at an excellent level of service during both peak hour periods, with all movements at level of service B or better, satisfying the RLTS requirements.

9.4.2.3 Weedons Road / SH1 On & Off Ramps

The proposed construction of a diamond interchange at Weedons Road and SH1 introduces two intersections of Weedons Road with the on and off ramps for SH1. Within the microsimulation model these intersections have been provided as signalised intersections due to the presence of a highly dominant traffic flow between Weedons Ross Road and Christchurch during both the AM and PM peaks. The AM and PM peak performance for both the Weedons Road intersections with the SH1 on/off ramps are summarised below in Tables 15 and 16.

Signalised Intersection of Weedons Road and SH1 Northern On/Off Ramps		Volume (vph)	MOVEMENT		APPROACH		INTERSECTION	
			Avg. delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS
2021 AM Peak (7:30-8:30AM)								
Weedons Road North	Left Through	463 82	26 22	D C	25	C	20	B
SH1 Off ramp	Left Right	18 9	34 42	C D	37	D		
Weedons Road South	Right Through	396 405	19 14	B B	16	B		
2021 PM Peak (5:00-6:00PM)								
Weedons Road North	Left Through	181 23	18 22	C C	18	B	16	B
SH1 Off ramp	Left Right	5 2	40 33	D C	38	D		
Weedons Road South	Right Through	41 60	8 9	A A	9	A		

Table 15: Weedons Road / SH1 Northern On & Off Ramp Intersection Performance (2021)

Signalised Intersection of Weedons Road and SH1 Southern On/Off Ramps		Volume (vph)	MOVEMENT		APPROACH		INTERSECTION	
			Avg. delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS
2021 AM Peak (7:30-8:30AM)								
Weedons Road North	Right Through	12 77	27 28	C C	28	C	34	C
SH1 Off ramp	Left Right	26 364	3 40	A D	38	D		
Weedons Road South	Left Through	0 440	0 32	A C	32	C		
2021 PM Peak (5:00-6:00PM)								
Weedons Road North	Right Through	3 20	6 28	A C	26	C	16	B
SH1 Off ramp	Left Right	114 42	7 23	A C	11	B		
Weedons Road South	Left Through	1 57	21 24	C C	24	C		

Table 16: Weedons Road / SH1 Southern On & Off Ramp Intersection Performance (2021)

The above tables show the overall intersection performance for the northern intersection is LOS B during both the AM and PM peak while the southern intersection has with an overall intersection performance of LOS C during the AM Peak and LOS B during the PM peak. The overall intersection performances are all within the RLTS requirement.

9.4.3 Traffic Capacity Analysis Conclusions

The simulation analysis has shown that the existing road network surrounding the site, with an upgrade to a roundabout at the Hoskyns Road/Jones Road intersection, can accommodate the

traffic expected to be generated by the development facilitated by this plan change at an acceptable level of service with traffic demands predicted for 2021.

In particular the analysis has demonstrated that, prior to the Stage 2 of the Christchurch Southern Motorway, the two signalised intersections on SH1 at Hoskyns Road and Rolleston Drive can accommodate the expected traffic demands in the year 2021 at an acceptable level of service in their existing form.

There are, however, various road improvement proposals that will alter the traffic access routes for IZONE. The proposed grade-separated connection between Rolleston Drive and Hoskyns Road will provide for direct travel between IZONE and Rolleston and the proposed interchange at Weedons Ross Road will provide for travel between Rolleston (including IZONE) and Christchurch. There are also proposals for upgrading roads linking to IZONE (and Rolleston) as well as schemes to promote alternative modes. The simulation analysis conducted for the future road network with 2021 demands indicates that the expanded IZONE (and Rolleston) will be provided with an appropriate level of service and that the expanded IZONE will not adversely affect other traffic flows.

Very little traffic currently uses Railway Road and, although it is proposed to provide an access for IZONE directly to Railway Road, output from previous network modelling forecasts that very few vehicle movements associated with IZONE would use Railway Road. Vehicles travelling northwest and connecting with the West Coast Road (SH73) are expected to travel via the higher standard Hoskyns Road, which is programmed to be upgraded within the next ten years.

It is not expected that IZONE will generate a significant number of additional heavy vehicle traffic movements on local roads in the area. This conclusion is based on the detailed surveys undertaken of existing heavy vehicle use at local roads. The level of use of roads such as West Melton Road, Knights Road and Maddisons Road is low considering the extent of existing development at IZONE. Jones Road, Weedons Ross Road and Hoskyns Road are intended to be collector roads therefore can be expected to carry a certain number of heavy vehicles. Surveys have indicated that the section of Weedons Ross Road passing the local primary school does not carry a large number of heavy vehicles and there is no reason to expect IZONE's expansion to increase this occurrence. Monitoring of traffic counts will continue to be undertaken on Maddisons Road as part of the Plan Change 5 conditions to further ensure that any potential local network effects are identified.

10. Road Safety Effects

The establishment of the expanded IZONE area will have the following main road safety advantages over a comparable extent of business development elsewhere in the District:

- design concepts for the road network focused on a general configuration that has simple intersections and quality facilities for pedestrians and cyclists (through the provision of footpaths and wide carriageways)
- limited access to the external road network such that the potential traffic conflicts can be controlled to specific locations where high standards of intersection design can minimise the effects
- located with easy access to SH1
- separated from the Rolleston Township, such that heavy vehicle movements within the residential area and near community facilities are minimised
- any travel between IZONE and Christchurch will utilise SH1 for practically all its length, where SH1 is designed as a high-standard, major arterial route to carry high volumes of traffic

These factors demonstrate that IZONE, a comprehensive well designed business park, is likely to have better road safety effects than equivalent alternative provisions in smaller business development schemes elsewhere in the District.

11. Planning Requirements

11.1 Canterbury Regional Policy Statement

The Canterbury Regional Policy Statement (RPS) has been prepared to meet the requirements of the Resource Management Act 1991, and aims to promote sustainable management of natural and physical resources.

Chapter 15 of the RPS outlines four transport related policies. These policies are:

Policy 1: *"Protect Canterbury's existing transport infrastructure and land transport corridors necessary for future strategic transport requirements by avoiding, remedying, or mitigating the adverse effects of the use, development or protection of land and associated natural and physical resources on transport infrastructure."*

Policy 2: *"Promote the use of transport modes which have low adverse environmental effects."*

Policy 3: *"Promote changes in movement patterns, travel habits and the location of activities, which achieve a safe, efficient and cost-effective use of the transport infrastructure and reduce the demand for transport."*

Policy 4: *"Ensure that in the provision, realignment or maintenance of transport infrastructure, adverse effects on natural resources that meet the criteria of sub-chapter 20.4 are avoided, remedied, or mitigated."*

Sub-chapter 20.4 of the RPS outlines matters of "regional significance" from an environmental conservation (plant, wildlife, and heritage) view point, but is not applicable to the subject site from a transportation perspective.

The Plan Change proposal adheres to the other relevant policies of the RPS as:

- The major connection of the site to the existing strategic road network (SH1) will still only be via one intersection at Hoskyns Road initially (and then at Weedons Ross Road) and travel times on SH1 will not increase significantly; hence the primary through traffic movement function of SH1will be safeguarded.
- The internal layout of the site consists of primary and secondary roads set out in a hierarchal manner that allows for safe, efficient and direct access to properties within the site, and minimises travel distances, hence allowing for cost-effective transport movements.
- The internal layout of the site is pedestrian and cycle friendly through the provision of footpaths and wide carriageways, hence transport modes with low adverse environmental effects are promoted.
- The location of the site close to the Rolleston Township will result in increased employment opportunities for the local community which will in turn result in reduced demand for travel (through reductions in distance travelled) to and from employment locations further afield.
- There is potential for bus services to run through the site which would further result in reduced demand for vehicular traffic and fewer environmental effects.
- There is potential to transport freight by rail because the site is adjacent to the Midland Railway.
- For the longer term a flyover is proposed linking the residential and business areas of Rolleston. This will further protect SH1, improve efficiency and provide for more convenient and safe walking and cycling.

11.2 Proposed Change 1 to the RPS

Proposed Change 1 (PC1) to the RPS introduces a new Chapter, 12A (Development of Greater Christchurch), which provides direction for the growth, development and enhancement of the urban and rural areas of the Greater Christchurch area. It identifies and maps a number of greenfield areas for residential and business growth, including the extent of the area subject to this Plan Change proposal. Therefore this proposal is already contemplated by PC1 which emanates from the Urban Development Strategy Study.

Policies 1 (Urban Limits), 7 (Development Form and Design), 8 (Outline Development Plans and Changes of Zoning in District Plans) and 9 (Transport Effectiveness) of PC1 are relevant to this Plan Change proposal from a transportation perspective. The relevant elements of these policies are discussed below.

11.2.1 Policy 1: Urban Limits

Policy 1 states:

> *"…urban activities within Greater Christchurch shall only occur within the Urban Limits delineated on Map 1."*

Figure 16 shows the plan change site in relation to the Urban Limits for Rolleston and IZONE, as identified in Map 1 of Variation 1 to PC1. As can be seen, the proposed Plan Change site is not situated fully within the Urban Limits as the area of the zone envisaged by the Plan Change has been made more uniform than the existing 'L' shaped land indicated in PC1. The revised shape allows for a far more cohesive development than could be achieved with the site area identified under PC1 and is more in line with urban design best practice.

11.2.2 Policy 7: Development Form and Design

Policy 7 stipulates that activities in greenfield sites should provide for the following:

- *good safe connectivity within the area, and to surrounding areas, by a variety of transport modes, including motor vehicles, cycling, pedestrian and public transport, and provision for easy and safe transfer between modes of transport,*
- *being located within walkable distance to community, social and commercial facilities,*
- *provide effective, efficient and attractive walking paths and cycleways, preferably integrated with open space and stormwater detention areas, within, across and linking beyond the areas.*

The subject site is well connected to the existing road network, is adjacent to the Midland Railway and will cater for a range of transportation modes through wide carriageways which are cyclist friendly and the provision of footpaths for pedestrians. There is also potential for future bus services to run through the site. The provision of footpaths on at least one side of all internal roads will allow for safe access to the community facilities proposed within IZONE. Currently the pedestrian link between the site and the township is provided by the signalised crossing at the intersection of Rolleston Drive / SH1. The flyover proposed across SH1 is expected to include pedestrian and cyclist provisions, and there is also a proposal for another bridge across SH1 specifically for pedestrians and cyclists, which will provide a more direct route between IZONE and the Rolleston town centre.

The IZONE site makes provision for amenity hubs within the plan change area, the locations of which are shown in Figure 17. These amenity hubs will provide areas for recreation within walking distance and a base for community facilities which will be available for workers on site, as well as visitors to IZONE.

11.2.3 Policy 8: Outline Development Plans and Changes of Zoning in District Plans

Policy 8 stipulates that an area plan needs to demonstrate how effective provision is made for a range of transport options and changing between modes, including pedestrian, cycling, passenger transport, freight and private motor vehicles.

As noted above, the development proposal caters for a range of transportation modes through wide carriageway widths and footpaths, with the provision for buses to also run through the site. The wide carriageways and footpaths also allow for safe changing between modes (e.g. bus stops). The location of the site close to the existing strategic road network also allows for straightforward and efficient freight movements.

11.2.4 Policy 9: Transport Effectiveness

Policy 9 requires that development of greenfield sites shall not result in overloading the existing transport network infrastructure, in particular strategic roads, and avoid detracting from the primary through-traffic function of state highways and arterial roads. It also states that Territorial Authorities should ensure that transport networks provide for safe, sustainable, integrated movement of goods and people both within the sub-region, and to and from locations outside the sub-region.

Specific analysis for this Plan Change demonstrates that the development of the subject site will not result in the overloading of the existing transport network (as discussed in earlier sections of this report), and will not detract from the primary function of SH1, as no new connections to SH1 are proposed other than the Weedons Ross Road interchange. The grade-separated connection proposed between the Rolleston Township and IZONE will also ensure that the primary function of SH1 is not compromised.

The location of the site and internal layout of the site also allows for safe and efficient movement of goods and people, internally through the structure of roads, footpath provisions, and wide carriageway widths, and externally through good connections to the existing strategic road network.

11.3 The Greater Christchurch Urban Development Strategy (UDS)

The Urban Development Strategy (UDS) for the Greater Christchurch Area identifies specific areas for residential development between 2007 and 2041. The associated increases in traffic volumes require that parts of the road network be upgraded. The Regional Land Transport Strategy (RLTS) has been developed to manage changes to the transport network. District corridors have been identified that relate primarily to movements within the Greater Christchurch area. District corridors should provide users with good mode choice along the corridors but will not necessarily provide capacity for vehicles at all times.

In addition to improvements in the public transport system, nine potential packages of road network improvements have been described as part of the UDS, with the Selwyn District package being directly relevant to this transportation assessment. It has four major components.

The component with the earliest construction schedule is that for Rolleston which addresses improving connectivity between the township and IZONE, provision of a Park and Ride facility and improving capacity on the Selwyn Road - Shands Road corridor. These improvements are planned to occur before 2016. Two parts of the package are planned for the medium term 2016-26, which includes an arterial road package linking Lincoln, Rolleston and Prebbleton and improving the capacity of SH1 through minor intersection improvements and the Southern Motorway extension. The fourth component is the four-laning of Shands Road which is planned for the long term beyond 2026.

11.4 Canterbury Regional Land Transport Strategy

The Canterbury Regional Land Transport Strategy (RLTS) 2005-2015 describes a series of key result areas for achieving the vision of "the best possible quality of life".

The RLTS takes into account the priorities, needs and aspirations contained in the Updated New Zealand Land Transport Strategy and the Land Transport Management Act as well as other national policy documents specifically addressing vehicle emissions, road safety, walking and cycling and climate change.

The RLTS states that quality of life is supported by a land transport system that:

- provides equitable access for all sectors of the community
- supports a thriving economy
- promotes a social environment that is safe and supportive
- is consistent with a healthy, pleasant and pollution-free environment
- is safe to use
- involves community participation in land transport decision-making
- is part of an integrated planning framework
- is innovative and responsive to change

The RLTS identifies five key result areas that represent a balanced approach to achieving this vision. These areas are:

- alternative modes
- roads: safety, environment and infrastructure
- demand management
- land use
- freight

The proposed IZONE expansion is consistent with the RLTS in the following ways:

- there is potential for future public transport services to run through the site offering convenient connections and potential for future services to Christchurch and the wider Selwyn District.
- in terms of private transport the site location offers excellent access to the strategic road network for both light and heavy vehicles. This is consistent with the RLTS policy to locate major traffic attractors within areas of high accessibility.
- the composition of activities within the proposed development as well as those existing land uses nearby, offers the potential for trip linking where a user can make one trip to the area and perform a range of tasks. The site location and the range of activities in the surrounding area also offer potential opportunities for people to travel less, which is a goal of the RLTS. It is also a policy of the RLTS to encourage co-location of land uses at focal points that reduce the need to travel.
- a high standard pedestrian and cycle environment will be provided within the site. This promotes the use of these alternative modes within the site, and between the site and the other surrounding land uses located within Rolleston.
- a high standard internal layout for those moving around the site on foot, including potential public transport passengers, also contributes to achieving a safe and pleasant environment as well as contributing to the overall long term success of the development.

- the site location offers excellent access to the strategic road network, primarily Main South Road (SH1). The development will not impact on the programming of provision for improved transport infrastructure in the wider network as outlined in the RLTS, or require other regionally significant transport infrastructure provision not already programmed.
- the potential exists to utilise rail sidings for the movement of freight.

11.5 District Plan Policies and Objectives

Section 2.1 of the District Plan outlines the transportation related objectives and policies of the plan, along with the environmental outcomes expected as a result of their implementation. The following table discusses each expected outcome in relation to the development proposal.

Expected Environmental Outcome	Comments
Strategic Roads are safe and efficient transport routes for "through" traffic travelling across the District.	The through movement function of SH1 will not be compromised as no new connections to SH1 are proposed.
Other roads in the District serve all their functions safely and efficiently.	The road network within the site is well integrated with the existing road network, ensuring that the safety and efficiency of the existing road network is not compromised.
The visibility of roads, intersections, vehicular accessways and railway crossings is not impaired.	The layout of the site allows for good visibility internally at property accessways and intersections, and also externally at the intersections connecting the site to the existing road network, including existing railway crossings.
Roads are designed, maintained, and if necessary, upgraded to the standard required for their traffic volume, traffic type and the amenity values of the zone.	The roads within the site will be designed to a standard appropriate for their use, including wide carriageways allowing for heavy vehicle movement and cyclists. The internal network will have similar amenity values to the existing IZONE area.
Adverse effects of residential and business growth in Selwyn District on road links into Christchurch City are addressed.	The adverse effects of IZONE expansion on link roads to Christchurch (in particular SH1) are expected to be minor because it provides employment locally and because of the proposals for the upgrading of the routes to Christchurch.
Heavy traffic bypasses of townships, where practical.	Heavy traffic generated by the site for the most part will utilise SH1, and hence "bypass" the residential portion of the Rolleston Township and with the Southern Motorway Extension it will also bypass Templeton.
An increase in separate cycleways and walkways in townships.	Separate walkways are proposed but on-road cycling is proposed
No increase in the extent to which main transport routes "bisect" townships.	The development of the subject site will not result in an increase to the extent to which SH1 bisects the residential portion of the Rolleston Township and the provision of effective links from IZONE will overcome any bisecting effects.
Fewer impacts from the construction, maintenance and repair of roads or other utilities in road reserves, on people and the environment.	The site is a greenfield site, hence the construction of the project will have a minimal impact of the existing road network, and the local community.
New settlement and residential activities occur closer to places of work or existing townships.	The site will provide additional work places close to the expanding residential population of Rolleston.
The number of walkways and cycleways increase that are effective in providing alternative linkages within townships.	It is expected that the grade-separated link between Jones Road and Rolleston Drive proposed will include pedestrian and cyclist provisions.

Table 17: District Plan Policies and Objectives

As can be seen in the above table, the development proposal is expected to achieve the desired outcomes of implementing the transportation policies and objectives of the District Plan.

11.6 District Plan Rules

It is proposed that the subject site will be developed on the basis of the existing traffic and transportation rules within the District Plan.

While an indicative development layout has been prepared, it is not appropriate to undertake a full assessment of the development against the District Plan Rules as part of this Plan Change. The District Plan Rules will be taken into account during the design process, and in general it is expected that the development will comply with the transportation rules set out in the District Plan. If this is not the case than the relevant resource consent applications will be sought and will be able to be assessed against the relevant District Plan criteria.

12. Summary and Conclusions

Having undertaken a thorough investigation of all the traffic and transportation issues associated with the IZONE expansion proposal, it is concluded that the transportation needs of the proposed Plan Change will not have any significant long-term adverse effects on the transportation system.

It has been demonstrated that the road network surrounding IZONE will have sufficient capacity, generally in the current form, to accommodate the traffic generated by the extended IZONE with an acceptable level of service. The network will include an upgrade of Hoskyns Road between Jones Road and the proposed IZONE access which is proposed as part of Plan Change 5. This upgrade also involves an off-road pedestrian and cycle path and the conversion of the existing priority-controlled intersection of Hoskyns Road/Jones Road to a roundabout.

The proposed connections between IZONE and the surrounding road network will enable traffic to be distributed effectively onto the wider road network. The potential also exists to transport freight to/from the site using the Midland Railway which is adjacent to the site. The internal road layout caters for the industrial/business nature of the site through the provision of wide carriageways and an efficient grid network layout. This in turn ensures that IZONE will be able to accommodate the bus services that are to be provided through the area in the future. Consideration has also been given to the needs of pedestrians and cyclists through the provision of extensive footpaths and the road widths which will have enough space to accommodate cyclists.

The full development of the expanded IZONE is expected to result in increased traffic volumes on the surrounding roads approaching 6,100vpd. This increase is expected to occur over a number of years with full development occurring over a 7-12 year period depending on demand for sites. The existing network and short term upgrades can accommodate this level of demand and the longer term projects associated with the Christchurch Southern Motorway will ensure that future growth in general traffic demands can also be accommodated.

In terms of road safety, the comprehensive well-designed business park road network is likely to have a better level of performance than equivalent alternative provisions in smaller development schemes elsewhere in the District. As well as the internal network advantages, the efficient access to the external road network via high standard connections will also optimise road safety effects.

It is concluded that from a transportation viewpoint the IZONE expansion enabled by the proposed Plan Change will facilitate the effective establishment of a comprehensive employment area for Rolleston that is consistent with the Government policies relating to integrated land use / transport planning and the relevant transportation policies and objectives within the Selwyn District Plan and the Canterbury Regional Policy Statement.

Accordingly it is concluded that there are no transportation-related reasons for not approving the Plan Change application.

Traffic Design Group Ltd
30 October 2009