BROOKSIDE ROAD PLAN CHANGE

INTEGRATED TRANSPORT ASSESSMENT

PREPARED FOR GALLINA NOMINEES, HEINZ WATTIE PENSION FUND
AND BROOKSIDE ROAD RESIDENTIAL LTD | OCTOBER 2021

Stantec

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1 Introduction

Gallina Nominees, Heinz Wattie Pension Fund and Brookside Road Residential Ltd propose to re-zone approximately 110 hectares of rural land to the west of Rolleston for residential use. The site is on the western side of Dunns Crossing Road, adjacent to existing residential development east of the road and between two blocks of land subject to a current Plan Change request. The site could accommodate approximately 1,320 households if developed at 12 lots per hectare.

This integrated transport assessment has been prepared to assess the proposed Outline Development Plan for the Plan Change and the ability of the surrounding transport network to accommodate the proposed Plan Change. The report also includes background on the location of the site, the existing transport network around the site and planned future changes.

2 Site Location

As shown in **Figure 1**, the site for the proposed re-zoning is to the west of Rolleston.

Figure 1: Site Location in Context of Rolleston (Aerial Image Source: Google Earth)

Figure 2 shows the site in the context of the proposed District Plan road hierarchy in the south-west of Rolleston. The red lines are the arterial roads, with the key roads in the vicinity of the site being Main South Road (State Highway 1), Dunns Crossing Road, Lowes Road, Selwyn Road and Ellesmere Junction Road. The yellow lines are collector roads in the area. The figure also shows key nearby activities, being Brookside Park, West Rolleston Primary School and the Blossoms Educare preschool.

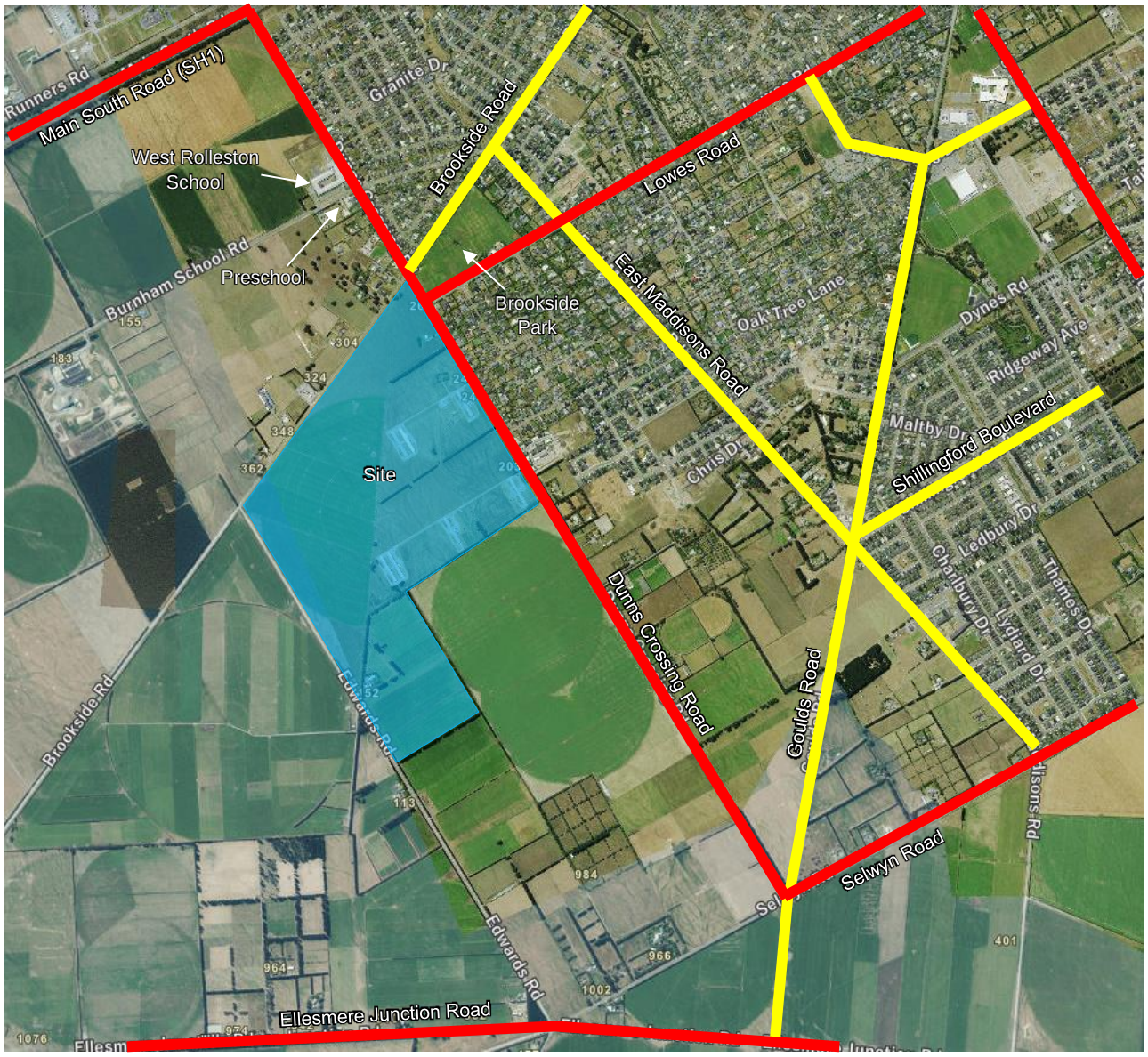

Figure 2: Site Location in Context of Proposed District Plan Surrounding Road Hierarchy (Aerial Image Source: Canterbury Maps)

Figure 3 shows that the site is zoned 'Outer Plains' in the Operative District Plan, which is a rural zoning. There are both Living Z and the older Living 1B zones on the opposite side of Dunns Crossing Road. The land to the south along Dunns Crossing Road is zoned for low-density residential development (Living 3 zone).

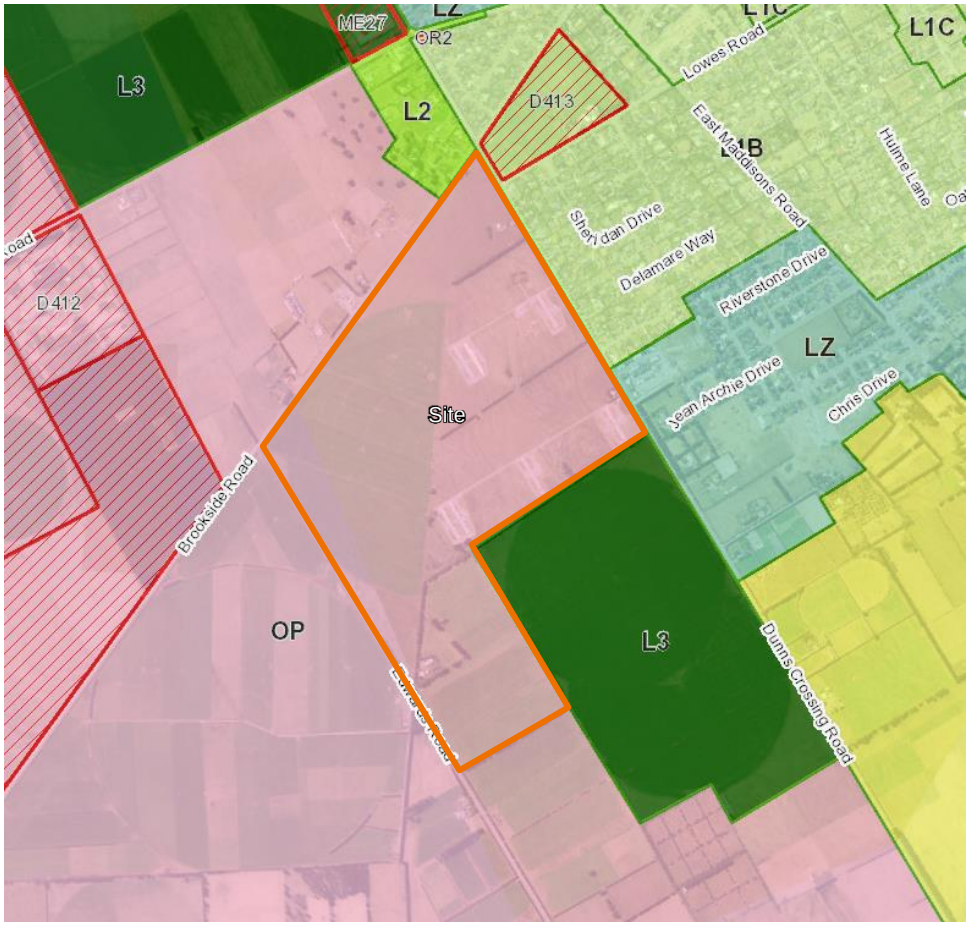

Figure 3: Operative District Plan Zoning

3 Existing Transport Network

3.1 Existing Roading

3.1.1 Dunns Crossing Road

The formation of Dunns Crossing Road varies along its length. Along the site frontage (**Photograph 1**), it has a rural formation on the site side of the road, with a 3m traffic lane and a wide grass berm. The road has been widened adjacent to development on the opposite side of the road to provide a 4m lane width, kerb and channel and a footpath.

Photograph 1: Dunns Crossing Road Site Frontage, Looking South

The speed limit is 60km/h along most of the site frontage and reduces to 50km/h south of the Lowes Road intersection.

To the north of Brookside Road, where there is development on both sides of the road including the school and preschool, there is carriageway widening and indented parking bays (**Photograph 2**).

Photograph 2: Dunns Crossing Road / Burnham School Road Intersection at West Rolleston Primary School, Looking South

3.1.2 Brookside Road

Brookside Road has a rural formation along the site frontage (**Photograph 3**), with a seal width of approximately 6.5m. It has an open road speed limit which reduces to 60km/h and then 50km/h on the approach to Dunns Crossing Road.

Photograph 3: Brookside Road Site Frontage, Looking East

East of Dunns Crossing Road, Brookside Road has an urban formation (**Photograph 4**) and provides a collector road route into Rolleston from the west.

Photograph 4: Brookside Road Site Frontage, Looking East

3.1.3 Dunns Crossing Road / Brookside Road Intersection

Brookside Road meets Dunns Crossing Road at a basic four-leg crossroad intersection (**Photograph 5**), with Dunns Crossing Road having priority.

Photograph 5: Brookside Road / Dunns Crossing Road, Looking South

3.1.4 Lowes Road

Lowes Road (**Photograph 6**) is an urban road which provides an arterial route through Rolleston.

Photograph 6: Lowes Road, Looking East

Lowes Road meets Dunns Crossing Road at a basic T-intersection, as shown in **Photograph 7**.

Photograph 7: Lowes Road / Dunns Crossing Road Intersection

3.1.5 Boulez Mews

Boulez Mews (**Photograph 8**) is a short cul-de-sac providing access to approximately 20 residential lots. It meets Dunns Crossing Road at a basic T-intersection opposite the site.

Photograph 8: Boulez Mews, Looking Away from Dunns Crossing Road

3.1.6 Other Dunns Crossing Road Intersections

At its southern end, Dunns Crossing Road has been realigned to meet Goulds Road at a T-intersection a short distance from Selwyn Road, as shown in **Figure 4** and **Photograph 9**.

Figure 4: Dunns Crossing Road / Goulds Road / Selwyn Road Intersection

Photograph 9: Dunns Crossing Road Approach to Goulds Road

3.1.7 Edwards Road

Edwards Road (**Photograph 10**) is an unsealed road which runs along the western edge of the site, between Brookside Road and Ellesmere Junction Road.

Photograph 10: Edwards Road Site Frontage, Looking North

Edwards Road meets Brookside Road at a basic T-intersection.

At its southern end, Edwards Road meets Selwyn Road, Ellesmere Junction Road and Swamp Road at a complex six-leg intersection (**Figure 5**). Ellesmere Junction Road has priority through the intersection with the other four legs all meeting that road at the intersection.

Figure 5: Ellesmere Junction Road / Selwyn Road / Edwards Road / Swamp Road Intersection (Aerial Image Source: Canterbury Maps)

Photographs 11 and **12** show the various approaches to the intersection.

Photograph 11: Edwards Road Intersection with Selwyn Road (Left) and Ellesmere Junction Road

Photograph 12: Edwards Road Intersection with Swamp Road (Left), Selwyn Road (Middle) and Ellesmere Junction Road

Photograph 2 shows the Burnham School Road basic crossroad intersection with Dunns Crossing Road.

At its northern end, Dunns Crossing Road meets Main South Road (SH1) at a crossroad intersection (**Photograph 13**). Dunns Crossing Road continues to the north as Walkers Road. This intersection has been formed as a major crossroad intersection with right turn bays on the main road and Stop controls.

Photograph 13: Dunns Crossing Road / Main South Road Intersection

3.2 Existing Cycle / Pedestrian Network

There is limited pedestrian and cycle provision in the south-west of Rolleston. Footpaths are typically provided on one side of roads only and there is no cycle specific infrastructure in the vicinity of the site.

There is one off-road connection for pedestrians from Dunns Crossing Road to Sheridan Drive which is within the older Living 1B zone, however there is no further connectivity towards the east opposite the site frontage.

3.3 Existing Public Transport Network

Figure 6 shows the existing public bus routes in Rolleston. The 5 Rolleston / New Brighton service (yellow line below) starts and ends with a loop of Brookside Park. This service runs between Rolleston and Christchurch approximately twice an hour during the day, with more frequent and express services provided during commuter peak times.

The 85 Rolleston / City Direct service (red line) and the 820 Burnham / Lincoln via Rolleston service (green line) run through Faringdon and other residential areas in the south of Rolleston. The 85 service runs at commuter times only while the 820 service runs hourly.

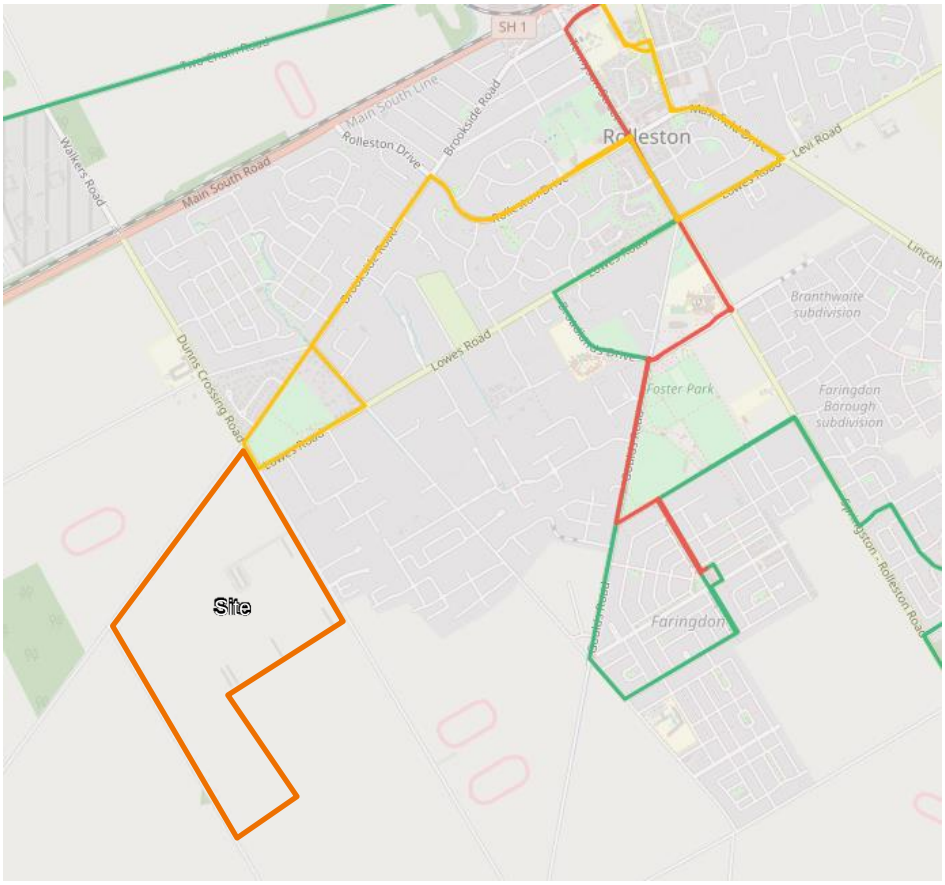

Figure 6: Existing Bus Routes in Rolleston

4 Existing Traffic Volumes

The following daily traffic volumes have been sourced from the Selwyn District Council website:

Table 1: Existing Traffic Volumes

Road	Location	Date	Daily Traffic Volume
Dunns Crossing Road	North of Brookside Road	August 2020	3,000vpd
Dunns Crossing Road	South of Lowes Road	September 2019	1,600vpd
Brookside Road	West of East Maddisons Road	July 2020	1,450vpd
Brookside Road	West of Dunns Crossing Road	August 2019	230vpd
Lowes Road	East of Dunns Crossing Road	October 2020	1,990vpd

The roads in the south-west of Rolleston carry moderate traffic volumes, and traffic capacity is not a concern. Dunns Crossing Road is the busiest road in the area due to its connection to Main South Road. Brookside Road and Lowes Road carry considerably higher traffic volumes further into Rolleston.

5 Crash History

The crash history of the nearby roads has been reviewed using Waka Kotahi NZ Transport Agency's Crash Analysis System. Reported crashes along the length of Dunns Crossing Road, the Brookside Road site frontage and Edwards Road since the start of 2016 have been reviewed.

15 crashes, including one serious-injury crash and seven minor-injury crashes, were recorded at the Dunns Crossing Road / Main South Road intersection. As described below, this intersection is proposed to be upgraded as part of works along the Main South Road corridor through Rolleston.

10 other crashes were reported along Dunns Crossing Road. Two of these (both minor-injury) occurred at the Brookside Road intersection, with drivers on Brookside Road failing to give-way, and one occurred at the Granite Drive intersection further north (also minor injury). The remaining seven crashes on Dunns Crossing Road occurred at midblock locations. At least two of these appear to have occurred when the southern section of the road was unsealed. In most of the other crashes, drink driving, driver fatigue, inexperienced driving or deliberate crashing were factors. One of the crashes (minor-injury) occurred outside the primary school and involved a child running across the road being hit by a car.

Seven crashes, including one serious-injury crash and three minor-injury crashes, were reported at the Selwyn Road / Goulds Road intersection. These all involved drivers on Goulds Road failing to give way to traffic on Selwyn Road, with most drivers claiming they did not see the approaching vehicle. No crashes were reported at the Goulds Road / Dunns Crossing Road intersection.

Four crashes, including one minor-injury crash, were reported at the Ellesmere Junction Road / Selwyn Road intersection. Three of these involved drivers losing control and only one involved a driver failing to give way.

6 Future Environment

6.1 Rolleston Access Improvements

The Rolleston Flyover and Transport Improvements project, as indicated in **Figure 7**, is being planned by Waka Kotahi. This $120 million project is being developed as part of the NZ Upgrade Programme. In the south-western part of Rolleston, a new dual-lane roundabout is indicated at the Main South Road / Dunns Crossing Road / Walkers Road intersection to act as a southern entrance to Rolleston. Dunns Crossing Road and Lowes Road are indicated to form part of a 'main commuter and freight route' through the southern part of the town.

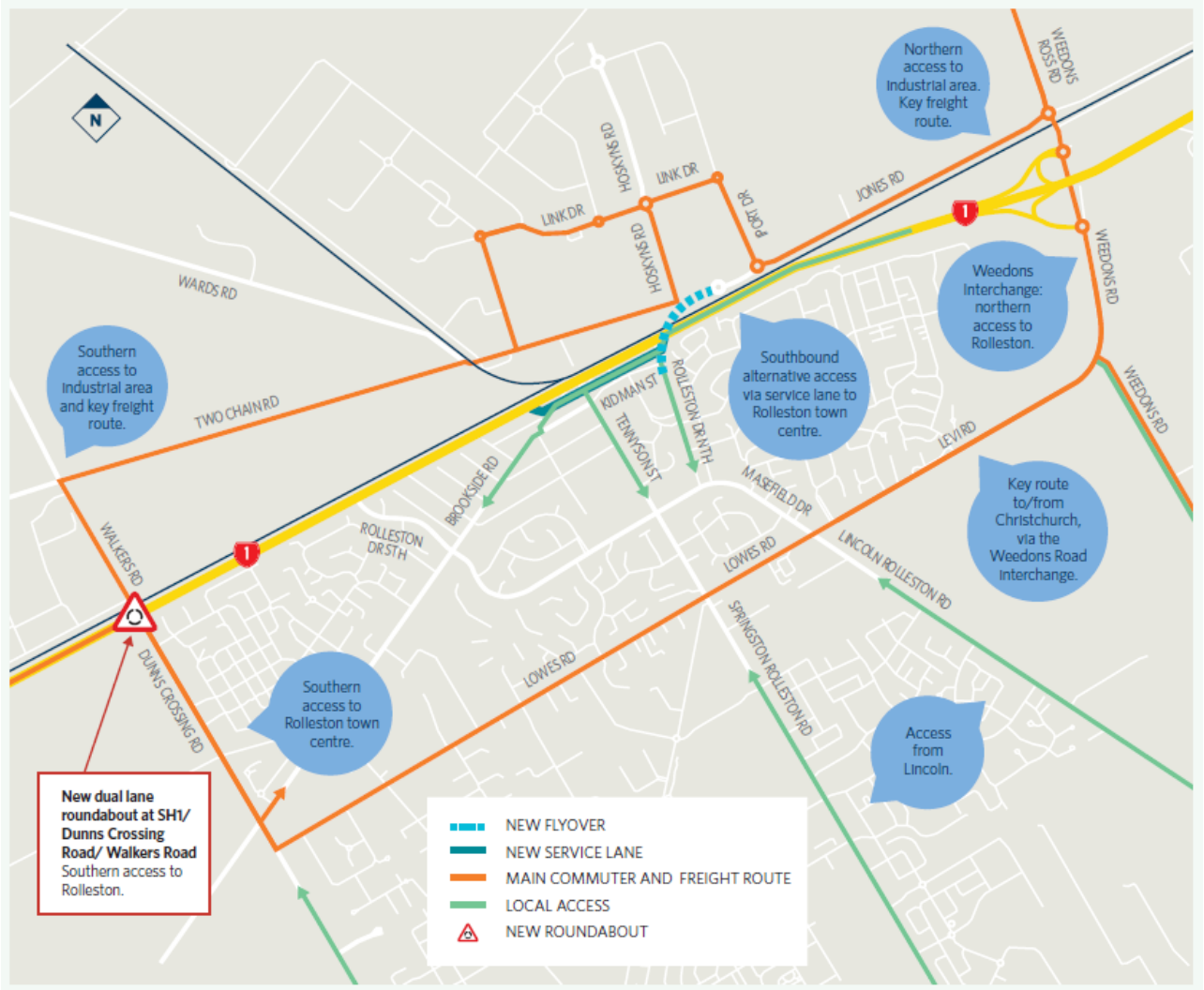

Figure 7: Proposed Rolleston Flyover and Transport Improvements (Waka Kotahi July 2021 Feedback Form)

6.2 Residential Growth

Rolleston ODP 12 from the Operative District Plan (**Figure 8**) applies to residential growth between Dunns Crossing Road and East Maddisons Road. The ODP anticipates new intersections on Dunns Crossing Road, including potentially a collector road intersection opposite the site.

Figure 8: Rolleston ODP 12 with Site Highlighted

As shown in **Figure 9**, The Boulevard retirement village has been constructed on the land at the northern end of the ODP 12 area Dunns Crossing Road frontage. It appears that Jean Archie Drive could extend out to Dunns Crossing Road in the future. If it does, its intersection would be expected opposite the end of the site frontage.

Figure 9: Development Area Opposite Site

Figure 10 is the plan for the subdivision south of Jean Archie Drive which is currently under construction. This includes a new intersection on Dunns Crossing Road south of the site and indicates a connection of Jean Archie Drive to Dunns Crossing Road. This subdivision ties into existing roads to the east which connect to East Maddisons Road.

Figure 10: The Crossing Subdivision Plan

6.3 Nearby Plan Change Applications

As shown in **Figure 11** from the Selwyn District Council website, there are a number of Operative District Plan Change requests that have been lodged for the south-western part of Rolleston. PC73 is split across two areas which are also on the western side of Dunns Crossing Road. PC70 and PC64 would represent expansions of Faringdon to the south-east and south-west.

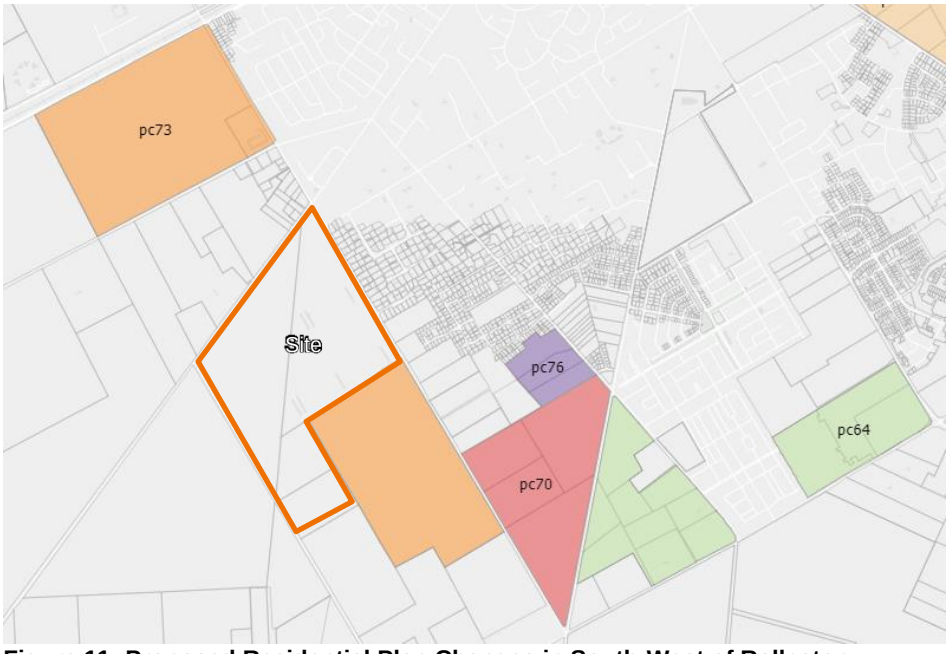

Figure 11: Proposed Residential Plan Changes in South-West of Rolleston

Figure 12 shows the proposed Outline Development Plan (ODP) for the southern section of the PC73 area (the Skellerup Block). It allows for several roading connections to Dunns Crossing Road as well as to the northern, western and southern boundaries of the site. The red area centrally located along the Dunns Crossing Road frontage represents a Business 1 zone, presumably intended for neighbourhood shops.

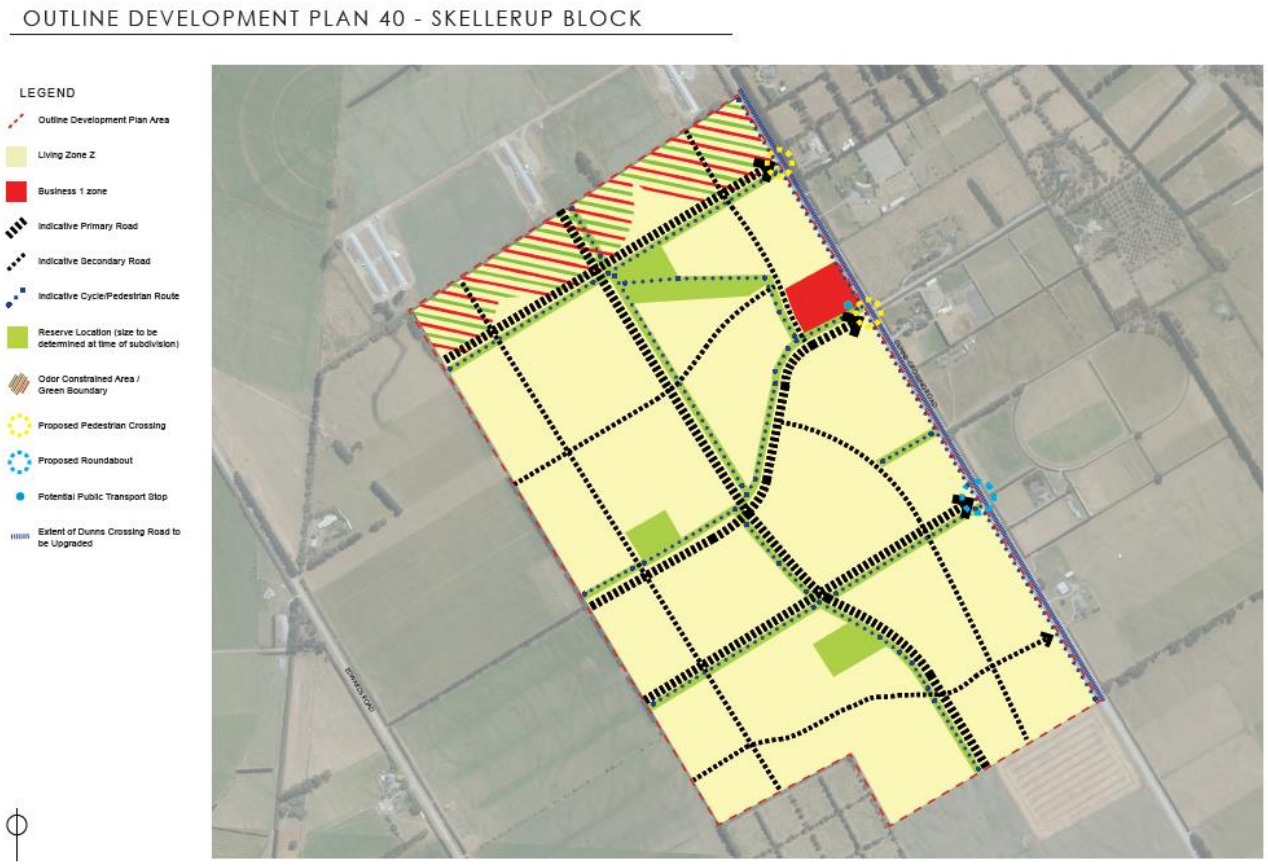

Figure 12: Proposed ODP for Southern PC73 Area

Figure 13 shows the proposed ODP for the northern section of the PC73 area (the Holmes Block). It allows for roading connections to Dunns Crossing Road and the southern site boundary. A Business 1 zone is proposed north of the primary school on Dunns Crossing Road.

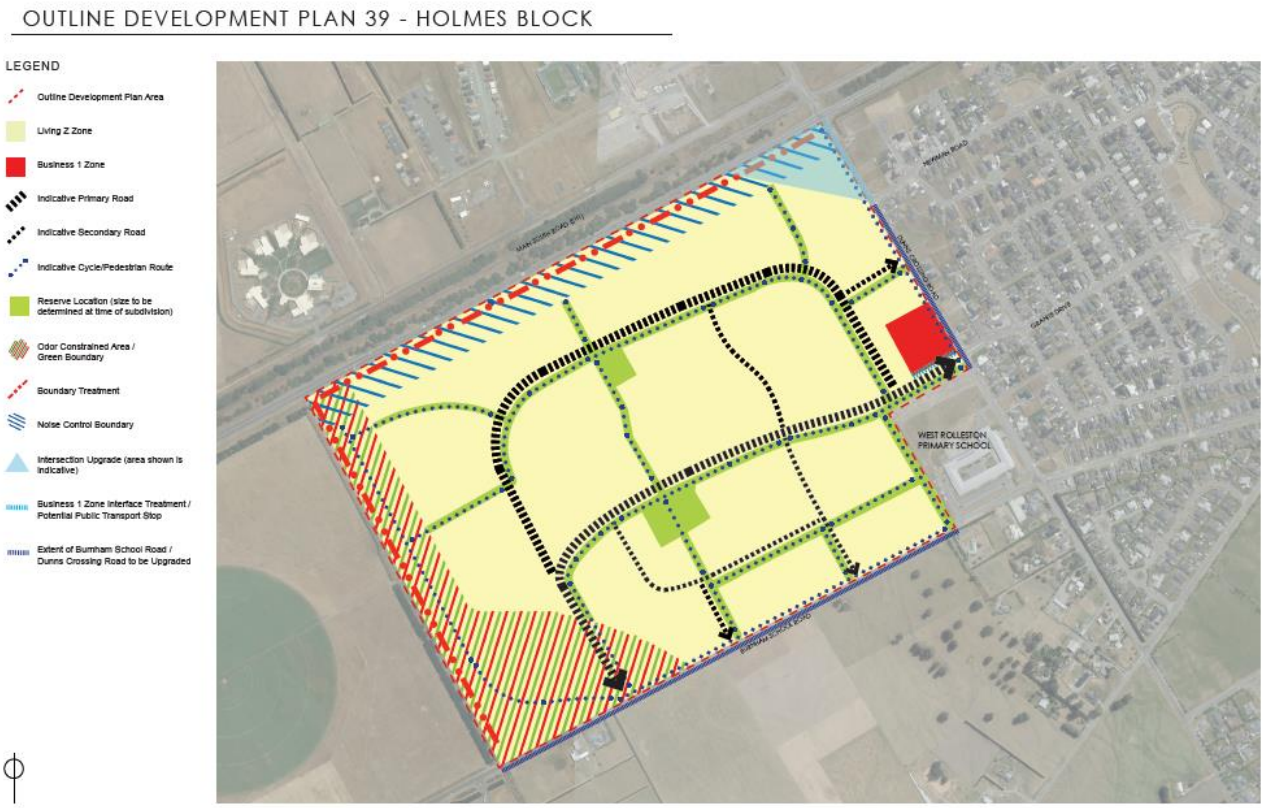

Figure 13: Proposed ODP for Northern PC73 Area

Figure 14 is the proposed ODP for the PC70 area (Faringdon Far West). Notably, it includes a 'primary road' from Goulds Road, opposite Shillingford Boulevard, to Dunns Crossing Road. The ITA prepared for PC70 indicates that a roundabout is proposed at the Goulds Road / Shillingford Boulevard intersection. Connecting to Shillingford Boulevard will allow the east-west collector route to be connected from Dunns Crossing, through Faringdon and beyond Springston Rolleston Road. Another Plan Change request, PC75, would allow the collector road to be completed through to Lincoln Rolleston Road.

PC70 includes multiple roading connections to Dunns Crossing Road, Goulds Road and the northern site boundary. A neighbourhood centre is proposed centrally along the Goulds Road frontage. It is noted that this PC70 land does not directly interact with the land subject to the Brookside Road Plan Change.

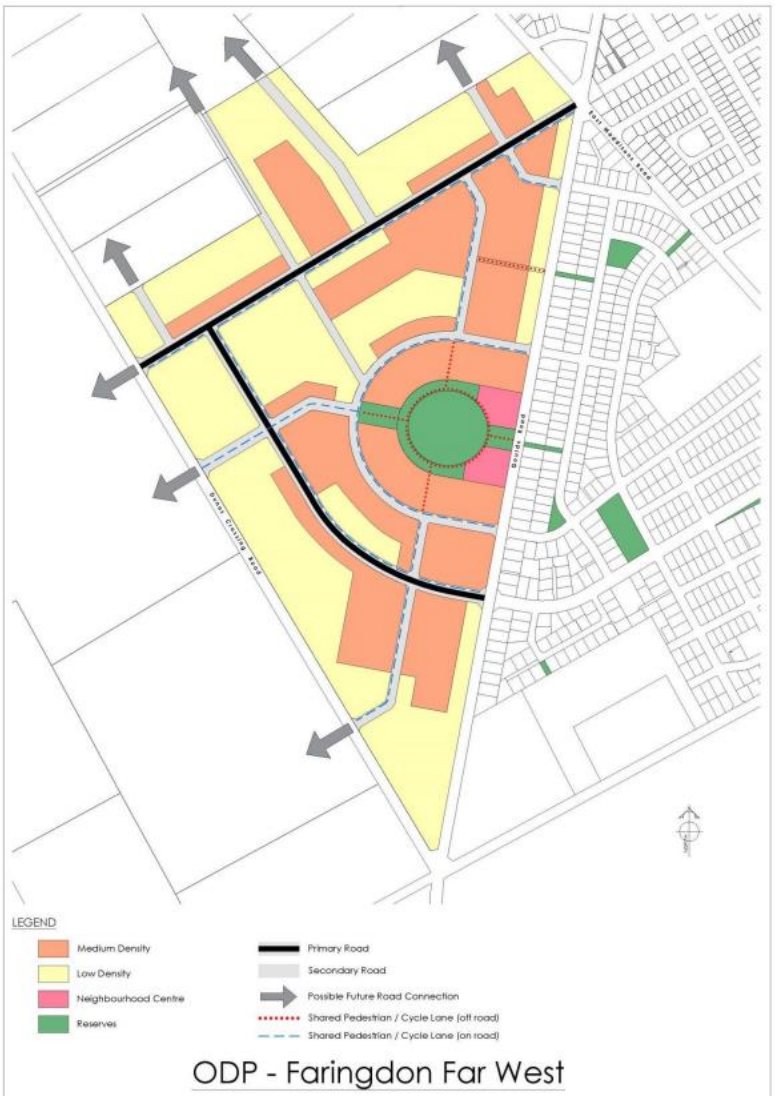

Figure 14: Proposed ODP for PC70 Area

6.4 Selwyn District Long Term Plan

The following projects are listed in the Selwyn District Plan for the upcoming 10-year period and beyond:

- Brookside Road seal to be extended from Edwards Road to Burnham Road, 2030/31
- Goulds / East Maddisons Road Roundabout, 2029/30
- Burnham School Road / Dunns Crossing Road Traffic Signals, 2032/33
- Lowes Road / Dunns Crossing Road Roundabout, 2035/36

7 Proposed Re-Zoning Overview

It is proposed to re-zone the approximately 110ha site from Outer Plains to Living Z. Based on a density of 12 lots per hectare, it is estimated that the site could accommodate approximately 1,320 residential lots. An ODP has been developed for the proposed Plan Change and this is shown in **Figure 15**.

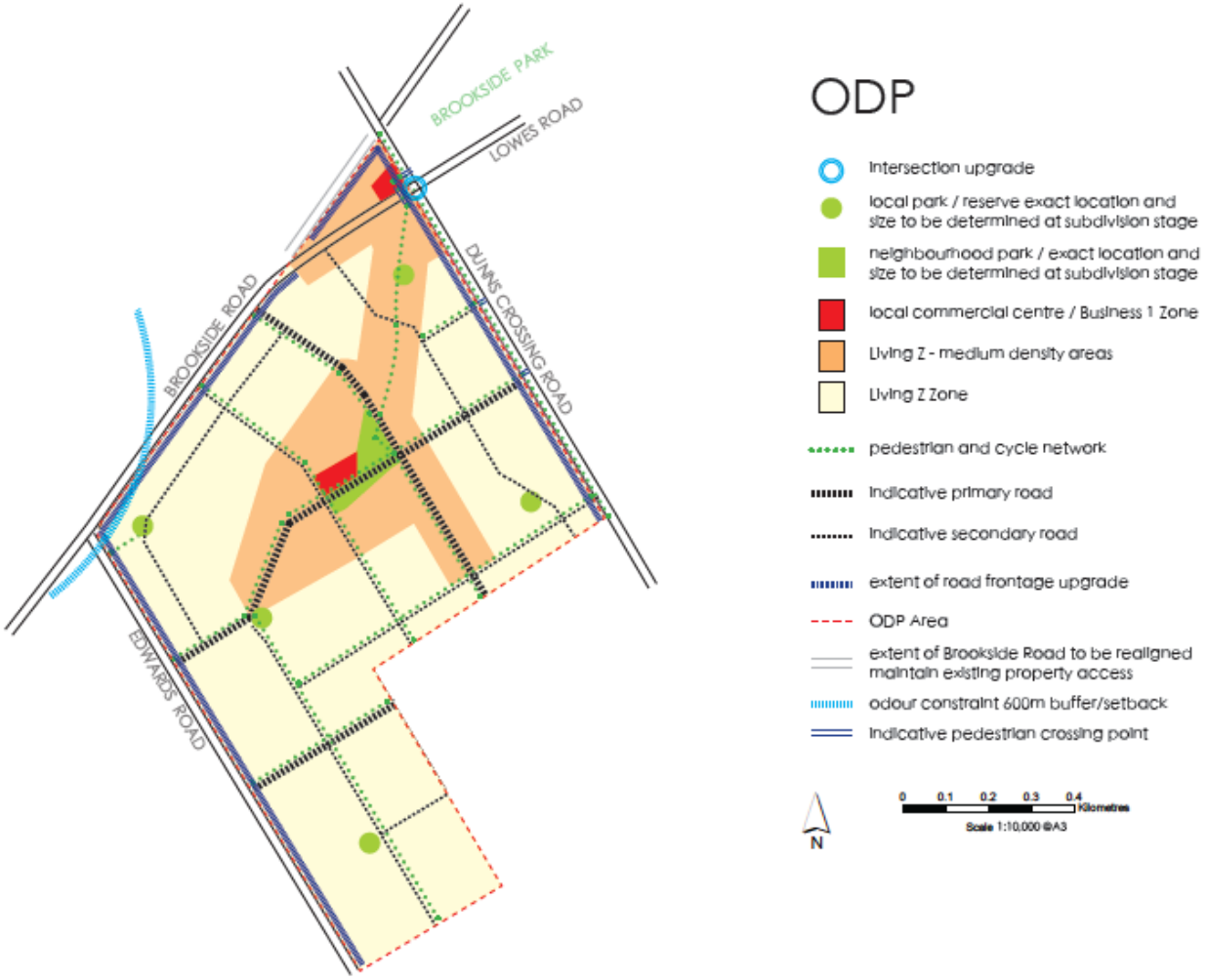

Figure 15: Proposed ODP

The ODP has been designed to tie into the PC73 Skellerup Block to the south of the site and with connections towards the PC73 Holmes Block to the north being allowed for. However, it is noted that the land between the site and the Holmes Block is still zoned for rural use and is not subject to a submission on the Proposed District Plan.

New intersections are proposed on Dunns Crossing Road, Brookside Road and Edwards Road.

One of the new connections is proposed at the Dunns Crossing Road / Lowes Road intersection, with a roundabout to be constructed in this location. The ODP proposes that Brookside Road west of Dunns Crossing Road be realigned to form this new connection. Details of how existing property access on the northern side of the realigned Brookside Road is maintained would be considered at the subdivision stage.

A second primary road connection to Dunns Crossing Road is proposed north of Boulez Mews.

Other minor roading connections are showing indicatively through the Plan Change area.

A series of reserves are indicated throughout the area and two neighbourhood commercial centres are indicated.

8 Traffic Effects Assessment

8.1 Traffic Generation / Distribution

Stantec traffic modellers have made use of the 2033 Rolleston Micro-Simulation Traffic Model for this assessment of the ability of the road network to accommodate the additional traffic that could be generated by 1,320 houses on the site. This model has been provided to Stantec by Selwyn District Council's transport consultant.

The following related to trip generation, distribution and mode shift were adopted for consistency with the model.

- Peak hour trips: 0.9 per household
- AM directional split: 75% departures, 25% arrivals
- PM directional splits: 40% departures, 60% arrivals
- Distribution consistent with that of the zone for the PC73 Holmes Block

The neighbourhood commercial centres would be expected to serve mostly the local area and passing traffic already on the road network. Accordingly, no allowance for the commercial centres has been made for in the traffic modelling exercise.

8.2 Traffic Modelling Exercise

A new zone was added to the simulation model as outlined below in **Figure 16**. The new zone was added with the following roading connections to be generally in accordance with the proposed ODP:

- Two connections to Dunns Crossing Road; one opposite Lowes Road at a roundabout and one opposite Boulez Mews;
- One connection to Brookside Road;
- Three connections to Edwards Road; and
- Three connections to the PC73 Skellerup Block.

It is noted that the new zone in the traffic model does not include the realignment of Brookside Road west of Dunns Crossing Road into Lowes Road, due to it being based off an earlier version of the ODP. It is considered that this will not impact the wider-area traffic assessment, e.g. that of the Main South Road / Dunns Crossing Road intersection performance. This will affect the local-area assessment of the Dunns Crossing Road intersections with Lowes Road and Brookside Road and these intersections are specifically addressed in the following sections of the report. The other primary connection to Dunns Crossing Road is opposite Boulez Mews whereas this is proposed through the latest ODP to be off-set to the north.

Figure 16: Extra Zone Added to Traffic Model

8.3 Traffic Modelling Outputs

8.3.1 Traffic Distribution

The following figure shows the distribution of the traffic that could be generated by a residential development of the site. This specific bandwidth plot shows the distribution of traffic leaving the site during the morning peak period which is

considered representative of the overall traffic distribution of the site. The overall distribution in terms of percentage of the site generated traffic on each route is also summarised in the notes on the figure.

Figure 17: Wide Area Traffic Distribution

This figure shows that the traffic generated would be relatively evenly split between Main South Road, Brookside Road, Lowes Road, the east-west collector road, and Selwyn Road. This indicates the site is well located to minimise impact on any specific part of the wider road network, although there is a concentration of movement through the north-eastern corner of the site (i.e. Dunns Crossing Road / Lowes Road).

It appears that the model is set up so that traffic travelling to Lincoln uses Springston Rolleston Road whereas there are other options in the south-west of Rolleston e.g. Goulds Road and Ellesmere Junction Road.

8.3.2 Key Intersection Performance

Based on the above, the performance of the following seven key nearby intersections was assessed, adopting the layouts that are allowed for in the transport model except for the Dunns Crossing Road / Lowes Road intersection as outlined:

- Dunns Crossing Road / Selwyn Road (upgraded so that Dunns Crossing Road meets Selwyn Road at a roundabout with Goulds Road meeting Dunns Crossing Road at a T-intersection)
- Dunns Crossing Road / PC73 Skellerup Block Northern Road (crossroad priority intersection with future connection on eastern side)
- Dunns Crossing Road / Lowes Road (three-leg roundabout in the base model upgraded to a four-leg roundabout with the Plan Change)
- Dunns Crossing Road / Brookside Road (existing priority crossroad intersection)
- Dunns Crossing Road / Burnham School Road (upgraded to traffic signals)
- Dunns Crossing Road / Main South Road (upgraded to dual-lane roundabout)

- Lowes Road / Tennyson Street (existing traffic signals)

The performance of the Plan Change area intersection with Dunns Crossing Road and Boulez Mews was also assessed.

The following table displays the average intersection delay for the key nearby intersections during morning and evening peak hours, without and with the proposed Plan Change. For roundabout and signal-controlled intersections, the delays reported are averages experienced by all drivers through the intersection. For priority-controlled intersections, the delays are the average delays for the worst movement, which is usually one of the side road right turn movements and can be a low-volume movement. Detailed outputs are contained in **Appendix A1-4**.

Table 2: Intersection Delays

Intersection	Base Model		With Plan Change	
	AM Peak	PM Peak	AM Peak	PM Peak
Dunns Crossing / Selwyn Roundabout	4s, LOS A	4s, LOS A	4s, LOS A	4s, LOS A
Dunns Crossing / PC73 Northern Road Priority Crossroad	28s, LOS D	20s, LOS C	21s, LOS C	19s, LOS C
Dunns Crossing / Boulez Priority Crossroad			15s, LOS B	12s, LOS B
Dunns Crossing / Lowes Roundabout	11s, LOS B	11s, LOS B	41s, LOS D	15s, LOS B
Dunns Crossing / Brookside Priority Crossroad	29s, LOS D	38s, LOS E	>120s, LOS F	29s, LOS C
Dunns Crossing / Burnham School Signals	15s, LOS B	10s, LOS A	26s, LOS C	10s, LOS A
Dunns Crossing / SH1 Roundabout	20s, LOS B	9s, LOS A	24s, LOS C	9s, LOS A
Lowes / Tennyson Signals	22s, LOS C	32s, LOS C	21s, LOS C	29s, LOS C

Generally, the roads in the south-west of Rolleston are forecast to carry moderate traffic volumes and the key intersections in the area will continue to be able to operate at satisfactory levels.

The forecast traffic volumes on Dunns Crossing Road in the vicinity of the site mean that moderate delays will be faced by drivers on side roads at priority-controlled intersections.

As mentioned earlier, one of the new primary roading connections to Dunns Crossing Road has been modelled opposite Boulez Mews whereas it is proposed to be off-set in the latest ODP. The crossroad intersection modelled is forecast to operate with a good level of service B during peak times and having the new road off-set from Boulez Mews will allow the two T-intersections to operate more safely and efficiently.

The northern PC73 intersection on Dunns Crossing Road is forecast to operate with delays representing an acceptable level of service C.

The Brookside Road intersection is forecast to operate with higher delays, although without the Plan Change, the high delays are associated with low volume turning movements. With the Plan Change, the highest delays are in the morning peak period for traffic on the western approach leaving the area. As has already been outlined, it is proposed through the ODP that Brookside Road west of Dunns Crossing Road be realigned into Lowes Road. This will remove the high-delay movements from the western approach to the intersection, providing safety and efficiency benefits to the existing intersection. The details of how existing property access on the northern side of the realigned section of Brookside Road is maintained would be considered at the subdivision stage. Access to the existing properties only could be retained through the Dunns Crossing Road / Brookside Road intersection or it may be preferable to convert that intersection into a T-intersection with existing property access to be provided via the realigned section of Brookside Road.

High delays representing a level of service F are forecast for traffic exiting the site at the Lowes Road roundabout during the morning peak period, due to reasonably high opposing flows. The arterial road approaches to the roundabout are forecast to operate with good levels of service A-C.

To understand the potential morning peak performance of the proposed four-leg roundabout and the impact of realigning Brookside Road into Lowes Road as proposed through the ODP, the proposed four-leg roundabout has been modelled using Sidra Intersection 9.0. The Sidra outputs are contained in **Appendix A.5**. Using the turning volumes from the traffic modelling exercise (without Brookside Road realigned), the Lowes Road roundabout is forecast to operate well

with levels of service A and B for all movements. It has then conservatively been assumed that all traffic turning to and from Brookside Road (west) at the Dunns Crossing Road intersection would use the Lowes Road roundabout if Brookside Road is realigned. The resulting increase in traffic volumes would lead to higher delays and levels of queuing on the realigned Brookside Road within the site, but with an acceptable level of service C still forecast for that approach. Other approaches, including the arterial road approaches on Dunns Crossing Road, would remain at level of service A.

Related specifically to this assessment of the roundabout performance, it should be noted that:

- Not all traffic turning to / from Brookside Road (west) would necessarily use the realigned Brookside Road; and
- The amount of traffic forecast to leave the site using the realigned Brookside Road would be over-stated as other minor local road connections to Dunns Crossing Road would be likely.

The Sidra modelling outputs suggest that the roundabout would operate to a significantly higher standard than that suggested by the wider-area simulation model. It is noted that a short-left turn lane could be considered at the design stage to improve efficiency for the relatively high-volume left turn out onto Dunns Crossing Road.

In the wider area, the upgraded Dunns Crossing Road / Burnham School Road and Dunns Crossing / SH1 intersections are forecast to operate well during peak periods and the additional traffic that could be generated by the site will not change this. Further into Rolleston, the additional traffic that could be generated by the site would not have a noticeable impact on the Lowes Road / Tennyson Street traffic signals.

8.4 Wider Traffic Effects

The traffic modelling indicates that approximately one quarter of traffic generated by a residential development of the site, representing approximately 260vph-320vph, could be to and from the east via the Christchurch Southern Motorway and Selwyn Road combined. This volume of traffic would be dispersed over multiple routes within Christchurch and would be able to be accommodated on the arterial road network. Traffic volume increases in other directions would be small.

It is considered that, from a traffic effects perspective, the west of Rolleston is a desirable area to meet housing demand when compared to the east of Rolleston. This is because arterial road traffic volumes are lower on the western side of Rolleston and the Dunns Crossing Road intersection will allow safe and convenient access to the state highway. Areas such as the Weedons Ross Road interchange in the east of Rolleston will have higher traffic volumes and less capacity in the township road network.

9 Proposed ODP Access Arrangements

9.1 Dunns Crossing Road Frontage

9.1.1 Intersections

As described, the ODP proposes two primary vehicle access points on the Dunns Crossing Road frontage; one opposite Lowes Road and one north of Boulez Mews.

The traffic modelling exercise allowed traffic to use Brookside Road west of Dunns Crossing Road whereas it is proposed through the ODP to realign this section of Brookside Road into the Lowes Road intersection. This will simplify the existing Dunns Crossing Road / Brookside Road intersection, providing safety and efficiency benefits to the intersection, and at least delay any need to upgrade it.

As outlined earlier, the proposed roundabout at the Dunns Crossing Road / Lowes Road intersection could operate with high delays for traffic leaving the site during the morning peak period. However, a roundabout would be a safe intersection form and the important arterial routes of Dunns Crossing Road and Lowes Road are forecast to operate well.

The design of the roundabout would need to be considered at the subdivision stage to ensure that the property boundaries allow enough room for an appropriately sized roundabout for the speed environment. A short left turn lane could be considered on the subdivision approach to cater to the dominant left turn movement and improve the efficiency of the approach.

The other main connection to Dunns Crossing Road was modelled opposite Boulez Mews. The traffic modelling showed that the intersection would be able to operate efficiently. The ODP indicates that the intersection would be off-set to the north of Boulez Mews to avoid an unnecessary crossroad intersection on an arterial route and the two T-intersections will operate safely and efficiently. The new T-intersection would be designed at the subdivision and detailed design stages to ensure an appropriate design which ties into the frontage road.

Any other minor local road connections to Dunns Crossing Road could be considered at the subdivision stage, noting that it may be preferable from a road safety perspective to limit the number of intersections on the arterial road.

9.1.2 Frontage Road Upgrades

Dunns Crossing Road would be upgraded along the site frontage to an urban standard, similar to that which has been adopted on the opposite side of the road. It is noted that the 4m width from centreline to kerb adopted on the opposite side of the road is narrow for an arterial road. It was observed that a vehicle parked kerbside requires passing vehicles to cross the centreline which is not desirable on an arterial road. The frontage road upgrade would be considered further at the subdivision design and detailed design stages but could include a widened traffic lane and indented parking bays.

Direct vehicle access to individual lots is provided on the eastern side of the road and it is considered that this could also be provided along the site frontage, however this would need to be considered further at the subdivision stage.

Cycle provision should be considered although it is noted that there is no cycle provision in this part of Rolleston and any cycle provision would need to be part of a wider cycle strategy led by SDC.

9.1.3 Pedestrian Provision

The ODP includes indicative pedestrian crossing points in key locations along Dunns Crossing Road. Safe pedestrian crossing provision will need to be considered further at the subdivision design stage. Pedestrian crossing points may be desirable at all intersections given likely crossing desire lines and other crossing locations where crossing demand could exist should be considered. The form of crossing points, e.g. with refuge islands, should be considered at the subdivision design stage.

It is considered that a footpath along the western side of Dunns Crossing Road between the site and the nearby primary school and preschool should also be provided when the site is developed.

9.2 Brookside Road Frontage

No constraints on intersection locations along Brookside Road have been identified. The exact locations and forms of intersections would be matters for subdivision planning and design. It would be preferable that crossroad intersections are avoided by either off-setting local roads, or providing roundabouts on any major local road or collector road routes.

It is expected that Brookside Road would be upgraded to an urban standard along the frontage of any residential development. This would include seal widening if necessary, kerb and channel and a footpath, in conjunction with a reduced speed limit.

It is considered that there would be no reason not to allow direct property access along Brookside Road provided an appropriate speed limit is in place.

9.3 Edwards Road Frontage

The ODP indicates vehicle access to Edwards Road in several locations. No constraints on intersection locations along Edwards Road have been identified however the road will need to be sealed and widened to an appropriate formation for use by local residential traffic.

The traffic modelling carried out indicates that there will be some travel demand from the site to the south, e.g. to Lincoln, and to the east along Selwyn Road. Edwards Road could be a convenient route down to Selwyn Road or Ellesmere Junction Road for traffic travelling in these directions. It is recommended that before any houses are occupied on parts of the site with vehicle access to Brookside Road or Edwards Road, the likely use of Edwards Road to the south of the site and the Edwards Road / Ellesmere Junction Road intersection is considered further. If this route is likely to be an attractive route, it may be necessary to seal the entire length of Edwards Road and to upgrade the Ellesmere Junction Road intersection. Minor realignments of local road approaches at complex intersections are relatively common around Canterbury and in this case it may be preferable to combine the Edwards Road and Selwyn Road approaches on the outside of the curve in Ellesmere Junction Road.

10 Proposed ODP Internal Layout

10.1 Public Transport Provision

No specific public transport provisions are proposed as part of the ODP. However, it is expected that the new primary roads would be designed to be able to accommodate some form of public transport in the future. Environment Canterbury reviews its public transport routes periodically in response to growth in demand and there are examples of bus services in other parts of Rolleston serving new residential areas. It is possible that a public transport service could link the western parts of Rolleston to the town centre in the future.

It is noted that the site is in close proximity to the existing start / end of the Rolleston / New Brighton bus service which loops Brookside Park. Safe pedestrian routes and crossing points would need to be ensured through the subdivision design so that residents can access the existing bus stops. It is considered that the proximity of the site to the existing bus route means that it is relatively well located to be served by public transport compared to much of Rolleston.

10.2 Pedestrian / Cycle Provision

It is expected that footpaths would be provided along all roads within the site. Most existing roads in the area have single footpaths whereas two footpaths would be encouraged on new roads for improved accessibility and safety for all users. It is noted that the range of footpath users is ever changing and now includes micro-mobility users such as scooter users. It is also expected that cycling on footpaths will become legal in the short-term so footpath designs will need to take all of these factors into account in the future.

Off-road paths will be provided through the series of reserves proposed throughout the ODP area. These would be expected to cater to recreational pedestrians and cyclists.

Whether specific on-road cycling infrastructure is provided would be a consideration for the subdivision design stage. As alluded to earlier, there is very limited cycling provision in the surrounding area so any new cycling infrastructure would need to fit with a wider cycling strategy.

10.3 Internal Roading

The details of the internal roading layout would be firmed through later design stages. A local road hierarchy will be able to be adopted with appropriate road cross-sections to encourage slow vehicle speeds that will cater for traffic and on-street parking. Appropriate intersection locations and formations will also be able to be confirmed through later design stages.

11 District Plan Objectives

11.1.1 Transport Network Objectives and Policies

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

> *Policy B2.1.2- Manage effects of activities on the safe and efficient operation of the District's existing and planned road network, considering the classification and function of each road in the hierarchy.*
>
> *Policy B2.1.3- Recognise and protect the primary function of roads classified as State Highways and Arterial Roads to ensure the safe and efficient flow of 'through' traffic en route to its destination.*
>
> *Policy B2.1.12- Address the impact of new residential or business activities on both the local roads around the site and the District's road network, particularly Arterial Road links with Christchurch City.*

These three policies are closely related.

As discussed previously, additional traffic that could be generated by the proposed site would be accommodated on the planned wider road network. The traffic modelling that has been carried out indicates that traffic on the arterial road network, primarily Dunns Crossing Road and Main South Road, would continue to experience good levels of service with the site developed.

If development is to connect to Brookside Road and / or Edwards Road, it is recommended that consideration is given to whether sealing Edwards Road to Ellesmere Junction Road and simplifying the Ellesmere Junction Road intersection is necessary prior to development.

Subdivision development will be subject to consideration of the road hierarchy in application of the transport rules, which will provide the usual additional protections of the arterial function of Dunns Crossing Road.

> *Policy B2.1.10- Ensure vehicle crossings, intersections, pathways, roadside signs and noticeboards are designed and positioned to ensure good visibility for all road users, and to allow safe passage, access and egress*
>
> *Policy B2.1.11- Ensure roads are designed, constructed, maintained and upgraded to an appropriate standard to carry the volume and types of traffic safely and efficiently*

These policies are related to details which will be able to be confirmed at the subdivision design stage. No reasons have been identified why these policies cannot be met.

> *Policy B2.1.5- Ensure the development of new roads is:*
> *-integrated with existing and future transport networks and landuses; and*
> *-is designed and located to maximise permeability and accessibility; through achieving a high level of connectivity within and through new developments to encourage use of public and active transport; whilst having regard to the road hierarchy.*
>
> *Policy B2.1.13- Minimise the effects of increasing transport demand associated with areas identified for urban growth by promoting efficient and consolidated land use patterns that will reduce the demand for transport*
>
> *Policy B2.1.14- Encourage people to walk or cycle within and between townships by providing a choice of routes for active transport modes and ensuring there is supporting infrastructure such as parking for cycles, at destinations.*
>
> *Policy B2.1.15- Require pedestrian and cycle links in new and redeveloped residential or business areas, where such links are likely to provide a safe, attractive and accessible alternative route for pedestrians and cyclists, to surrounding residential areas, business or community facilities.*

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

The site is proposed to connect to the adjacent proposed development to the south through PC73 as well as to the north if that land is developed in the longer term. The older developed area opposite the site is not permeable but the road corridors, including Brookside Road and Lowes Road, provide routes towards Rolleston. On a local level, development of the site will be expected to achieve a good level of permeability for non-car travel.

11.1.2 Growth of Townships Objectives and Policies

Section B4 of the District Plan contains objectives and policies related to the growth of townships. Of particular relevance to this application is the following objective:

> *Objective B4.3.4*
>
> *New areas for residential or business development support the timely, efficient and integrated provision of infrastructure, including appropriate transport and movement networks through a coordinated and phased development approach.*

This site is a logical extension of Rolleston, consolidating development in the western part of the town, with Edwards Road then forming a new logical western edge for the current planning period. The Main South Road intersection upgrade will improve the capacity of Dunns Crossing Road as will other planned upgrades along the arterial route.

11.2 Proposed District Plan Provisions

The Proposed District Plan (as notified) includes a range of matters relevant to consideration of the rezoning of the land.

The key matter at this planning stage is to ensure that there is consistency between the zoning proposal, including the ODP, and the PSDP Objectives and Policies, and higher-level planning documents. The rules are matters to be considered through future subdivision and land development, and will likely be subject to some change through the PSDP process.

An analysis of the PSDP objectives and policies has been carried out.

The District Wide – Strategic Directions included:

> *SD-UFD-O1 Urban growth is located only in or around existing townships and in a compact and sustainable form….*
>
> *SD-UFD-O3 Urban growth and development:*
>
> *1. is well-integrated with the efficient provision, including the timing and funding, of infrastructure; and*
>
> *2. has the ability to manage or respond to the effects of climate change.*

The site is located adjacent to an area where development has been proposed through Plan Change 73 to the ODP, and is an extension to current subdivision on the eastern side of Dunns Crossing Road. It is near to facilities such as a primary school, recreation park, and has good access to the arterial road network where improvements are planned to support a major access point into Rolleston at the northern end of Dunns Crossing Road..

The development will allow connection to the existing arterial road network, affording efficient distribution of traffic across many routes. The change in traffic volumes and performance is of a sufficiently low scale that it would be unlikely to significantly alter the timing of wider area transport network improvements that are either included in the Long Term Plan, or anticipated through long term transport modelling investigations.

As the site is located adjacent to an arterial road, and existing bus routes, there is good opportunity for the site to ultimately be serviced by public transport.

The Transportation section includes objectives as follows:

> *TRAN-O1*
>
> *People and places are connected through safe, efficient, and convenient land transport corridors and land transport infrastructure which is well integrated with land use activities and subdivision development.*
>
> *TRAN-O2*
>
> *Land transport corridors and land transport infrastructure are protected from incompatible land use activities and subdivision development.*

TRAN-O3

Land transport corridors and land transport infrastructure support the needs of people and freight, while ensuring adverse effects on the surrounding environment from their establishment and operation are managed.

As discussed earlier, the site development is able to integrate with existing or planned development where future connections to the site have already been anticipated through Plan Change 73. The additional links support integration of the local transport network west of Dunns Crossing Road. The use of an ODP, combined with Transport rules will protect the arterial Dunns Crossing Road from inappropriate access. The higher order roads in the ODP can support cycle and pedestrian access, as well as a potential bus route as necessary.

11.3 Canterbury Regional Policy Statement

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

The relevant Chapter 5 policies relate to urban growth being attached to existing urban areas, the safety and efficiency of the strategic and arterial road network being maintained, and connectivity for pedestrians and cyclists being provided. Chapter 6 focusses on new residential development occurring in the planned locations, transport effectiveness and integration of land use and infrastructure. The site is located outside the projected infrastructure boundary for Rolleston as shown on Chapter 6 Map A. From a transport perspective, Dunns Crossing Road is an increasingly important transport corridor for distribution of traffic around Rolleston, and this development will enable available capacity to be utilised that will minimise additional through traffic within Rolleston.

Generally, the policies relating to transport are similar to those in the PSDP which have been discussed previously. The proposed zoning request area is adjacent to other Plan Change areas where development is proposed, and the ODP is integrated with those future development areas.

The physical requirements of a bus route which could be an extension of existing services can be considered through road design in accordance with the District Plan.

11.4 National Policy Statement – Urban Development

The National Policy Statement Urban Development 2020 sets policy around urban development. New development capacity is considered against whether that development capacity is "infrastructure-ready". Based on the assessment provided, it is considered that there is adequate existing and planned infrastructure to support the wider transport needs of the proposed development. The ODP further requires connections to the existing transport network in locations that support safe and efficient integration of the site. It is also considered that the development is generally well connected along the transport corridors. Public transport services can be contemplated to reduce reliance on private vehicle travel.

12 Recommendations and Conclusion

The following is a list of recommendations to be adopted through the Plan Change process:

- The upgrade of the Main South Road / Dunns Crossing Road intersection should be completed before house occupation within the site;
- A roundabout should be constructed at the Dunns Crossing Road / Lowes Road intersection before any house occupation in stages to be served by the extension of Lowes Road;
- Brookside Road (west) should be realigned into Lowes Road prior to house occupation in stages which have access to Brookside Road or Edwards Road;
- Before any houses in stages with vehicle access to Brookside Road or Edwards Road are occupied, the likely use of Edwards Road to the south and impacts on the safe operation of both Edwards Road and the Ellesmere Junction Road intersection should be assessed;
- A footpath along the western side of Dunns Crossing Road from the site to the Burnham School Road intersection (or an appropriate alternative route) should be provided prior to house occupation within the site;
- Future collector roads within the site should be designed to be able to accommodate buses; and
- Safe and convenient walking routes, including crossing points, should be provided between the site and existing bus stops adjacent to Brookside Park before house occupation within the site.

Residential development of the site will result in relatively large traffic volume increases in the western part of Rolleston in particular. As outlined, it is considered that the west of Rolleston is a logical area for an extension of Rolleston to meet housing demand from a transportation perspective. The upgraded Main South Road / Dunns Crossing Road intersection will have capacity for residential traffic to get onto Main South Road and travel towards Christchurch.

On a local level, safe access to the arterial road network will be able to be provided to Dunns Crossing Road. A range of intersection upgrades in the area are planned to enable continued residential development in the south-west of Rolleston.

The ODP proposed will ensure that good connectivity is available to the existing residential areas of Rolleston and the adjacent PC73 land.

Appendices

We design with community in mind

Appendix A Traffic Modelling Summaries

A.1 Base Model AM Peak

Intersection	Approach	Mvt	Movement			Approach			Intersection		
			Vol	Delay	LoS	Vol	Delay	LoS	Vol	Delay	LoS
Selwyn Rd / Dunns Crossing Rd	North	L	184	2.3	A	282	2.1	A	702	3.8	A
Selwyn Rd / Dunns Crossing Rd	North	T	47	1.6	A						
Selwyn Rd / Dunns Crossing Rd	North	R	51	1.8	A						
Selwyn Rd / Dunns Crossing Rd	East	L	7	2.2	A	212	3.3	A			
Selwyn Rd / Dunns Crossing Rd	East	T	148	3.1	A						
Selwyn Rd / Dunns Crossing Rd	East	R	57	3.8	A						
Selwyn Rd / Dunns Crossing Rd	South	L	0	-	-	87	12.9	B			
Selwyn Rd / Dunns Crossing Rd	South	T	80	12.6	B						
Selwyn Rd / Dunns Crossing Rd	South	R	7	15.8	B						
Selwyn Rd / Dunns Crossing Rd	West	L	53	1.7	A	122	2.0	A			
Selwyn Rd / Dunns Crossing Rd	West	T	68	2.3	A						
Selwyn Rd / Dunns Crossing Rd	West	R	0	-	-						
Dunns Crossing Rd / PC73 Road	North	L	30	2.8	A	299	6.2	A	940	27.8	D
Dunns Crossing Rd / PC73 Road	North	T	227	1.4	A						
Dunns Crossing Rd / PC73 Road	North	R	42	6.2	A						
Dunns Crossing Rd / PC73 Road	East	L	3	5.9	A	53	27.8	D			
Dunns Crossing Rd / PC73 Road	East	T	7	26.9	D						
Dunns Crossing Rd / PC73 Road	East	R	44	27.8	D						
Dunns Crossing Rd / PC73 Road	South	L	6	1.0	A	412	7.4	A			
Dunns Crossing Rd / PC73 Road	South	T	394	2.0	A						
Dunns Crossing Rd / PC73 Road	South	R	13	7.4	A						
Dunns Crossing Rd / PC73 Road	West	L	148	12.1	B	176	13.8	B			
Dunns Crossing Rd / PC73 Road	West	T	16	13.8	B						
Dunns Crossing Rd / PC73 Road	West	R	11	12.7	B						
Dunns Crossing Rd / Lowes Rd	North	L	225	5.8	A	503	7	A	1406	11.0	B
Dunns Crossing Rd / Lowes Rd	North	T	278	8.1	A						
Dunns Crossing Rd / Lowes Rd	East	L	30	20.5	B	174	23	C			
Dunns Crossing Rd / Lowes Rd	East	R	144	23.9	C						
Dunns Crossing Rd / Lowes Rd	South	T	624	10.4	A	729	11	B			
Dunns Crossing Rd / Lowes Rd	South	R	105	12.5	B						
Dunns Crossing Rd / Brookside Rd	North	L	27	2.3	A	461	7.1	A	1329	29.4	D
Dunns Crossing Rd / Brookside Rd	North	T	429	2.5	A						
Dunns Crossing Rd / Brookside Rd	North	R	6	7.1	A						
Dunns Crossing Rd / Brookside Rd	East	L	67	6.7	A	86	29.4	D			
Dunns Crossing Rd / Brookside Rd	East	T	9	29.4	D						
Dunns Crossing Rd / Brookside Rd	East	R	10	29.2	D						
Dunns Crossing Rd / Brookside Rd	South	L	9	11.7	B	772	14.7	B			
Dunns Crossing Rd / Brookside Rd	South	T	607	5.3	A						
Dunns Crossing Rd / Brookside Rd	South	R	157	14.7	B						
Dunns Crossing Rd / Brookside Rd	West	L	2	8.7	A	9	23.9	C			
Dunns Crossing Rd / Brookside Rd	West	T	5	21.7	C						
Dunns Crossing Rd / Brookside Rd	West	R	3	23.9	C						
Dunns Crossing Rd / Burmham School Rd	North	L	2	10.9	B	214	15.4	B	1141	15.3	B
Dunns Crossing Rd / Burmham School Rd	North	T	196	14.6	B						
Dunns Crossing Rd / Burmham School Rd	North	R	16	25.0	C						
Dunns Crossing Rd / Burmham School Rd	East	L	0	-	-	5	21.3	C			
Dunns Crossing Rd / Burmham School Rd	East	T	2	18.3	B						
Dunns Crossing Rd / Burmham School Rd	East	R	3	23.6	C						
Dunns Crossing Rd / Burmham School Rd	South	L	164	11.4	B	625	12.8	B			
Dunns Crossing Rd / Burmham School Rd	South	T	458	13.3	B						
Dunns Crossing Rd / Burmham School Rd	South	R	3	13.9	B						
Dunns Crossing Rd / Burmham School Rd	West	L	53	16.0	B	297	20.3	B			
Dunns Crossing Rd / Burmham School Rd	West	T	6	17.8	B						
Dunns Crossing Rd / Burmham School Rd	West	R	238	21.4	C						

Dunns Crossing Rd / SH 1	North	L	108	16.0	B						
Dunns Crossing Rd / SH 1	North	T	64	21.1	C	187	18.6	B			
Dunns Crossing Rd / SH 1	North	R	16	26.7	C						
Dunns Crossing Rd / SH 1	East	L	97	4.8	A						
Dunns Crossing Rd / SH 1	East	T	790	6.5	A	974	6.2	A			
Dunns Crossing Rd / SH 1	East	R	88	5.0	A				2727	19.8	B
Dunns Crossing Rd / SH 1	South	L	134	36.6	D						
Dunns Crossing Rd / SH 1	South	T	135	37.2	D	875	42.1	D			
Dunns Crossing Rd / SH 1	South	R	607	44.3	D						
Dunns Crossing Rd / SH 1	West	L	46	8.4	A						
Dunns Crossing Rd / SH 1	West	T	562	11.3	B	690	11.2	B			
Dunns Crossing Rd / SH 1	West	R	83	12.2	B						
Lowes Rd / Tennyson St	North	L	32	18.0	B						
Lowes Rd / Tennyson St	North	T	377	18.6	B	443	18.1	B			
Lowes Rd / Tennyson St	North	R	35	13.1	B						
Lowes Rd / Tennyson St	East	L	113	11.7	B						
Lowes Rd / Tennyson St	East	T	87	21.8	C	221	18.9	B			
Lowes Rd / Tennyson St	East	R	21	44.8	D				2061	22.3	C
Lowes Rd / Tennyson St	South	L	56	17.4	B						
Lowes Rd / Tennyson St	South	T	642	23.4	C	925	22.5	C			
Lowes Rd / Tennyson St	South	R	228	21.2	C						
Lowes Rd / Tennyson St	West	L	112	23.4	C						
Lowes Rd / Tennyson St	West	T	295	28.5	C	472	27.4	C			
Lowes Rd / Tennyson St	West	R	65	29.7	C						

A.2 Base Model PM Peak

Intersection	Approach	Mvt	Movement			Approach			Intersection		
			Vol	Delay	LoS	Vol	Delay	LoS	Vol	Delay	LoS
Selwyn Rd / Dunns Crossing Rd	North	L	103	2.0	A						
Selwyn Rd / Dunns Crossing Rd	North	T	78	1.6	A	200	1.8	A			
Selwyn Rd / Dunns Crossing Rd	North	R	19	1.4	A						
Selwyn Rd / Dunns Crossing Rd	East	L	7	2.6	A						
Selwyn Rd / Dunns Crossing Rd	East	T	127	3.5	A	286	3.7	A			
Selwyn Rd / Dunns Crossing Rd	East	R	151	3.9	A				745	3.7	A
Selwyn Rd / Dunns Crossing Rd	South	L	0	-	-						
Selwyn Rd / Dunns Crossing Rd	South	T	70	11.6	B	75	11.9	B			
Selwyn Rd / Dunns Crossing Rd	South	R	5	16.5	B						
Selwyn Rd / Dunns Crossing Rd	West	L	101	2.1	A						
Selwyn Rd / Dunns Crossing Rd	West	T	83	2.7	A	184	2.4	A			
Selwyn Rd / Dunns Crossing Rd	West	R	0	-	-						
Dunns Crossing Rd / PC73 Road	North	L	57	3.2	A						
Dunns Crossing Rd / PC73 Road	North	T	375	1.8	A	562	7.1	A			
Dunns Crossing Rd / PC73 Road	North	R	130	7.1	A						
Dunns Crossing Rd / PC73 Road	East	L	4	10.1	A						
Dunns Crossing Rd / PC73 Road	East	T	11	20.3	C	63	20.4	C			
Dunns Crossing Rd / PC73 Road	East	R	48	20.4	C				1026	20.4	C
Dunns Crossing Rd / PC73 Road	South	L	10	1.0	A						
Dunns Crossing Rd / PC73 Road	South	T	289	2.0	A	312	9.9	A			
Dunns Crossing Rd / PC73 Road	South	R	13	9.9	A						
Dunns Crossing Rd / PC73 Road	West	L	73	6.0	A						
Dunns Crossing Rd / PC73 Road	West	T	10	15.1	B	90	15.1	B			
Dunns Crossing Rd / PC73 Road	West	R	7	11.2	B						
Dunns Crossing Rd / Lowes Rd	North	L	204	6.6	A	780	9	A			
Dunns Crossing Rd / Lowes Rd	North	T	576	9.6	A						
Dunns Crossing Rd / Lowes Rd	East	L	52	28.0	C	176	30	C	1411	10.8	B
Dunns Crossing Rd / Lowes Rd	East	R	124	30.8	C						
Dunns Crossing Rd / Lowes Rd	South	T	411	6.7	A	455	7	A			
Dunns Crossing Rd / Lowes Rd	South	R	44	8.5	A						

Dunns Crossing Rd / Brookside Rd	North	L	14	2.2	A						
Dunns Crossing Rd / Brookside Rd	North	T	625	2.6	A	642	4.9	A			
Dunns Crossing Rd / Brookside Rd	North	R	4	4.9	A						
Dunns Crossing Rd / Brookside Rd	East	L	149	12.3	B						
Dunns Crossing Rd / Brookside Rd	East	T	11	27.7	D	166	27.7	D			
Dunns Crossing Rd / Brookside Rd	East	R	5	16.3	C				1357	38.1	E
Dunns Crossing Rd / Brookside Rd	South	L	1	8.8	A						
Dunns Crossing Rd / Brookside Rd	South	T	430	3.7	A	535	12.2	B			
Dunns Crossing Rd / Brookside Rd	South	R	104	12.2	B						
Dunns Crossing Rd / Brookside Rd	West	L	3	10.7	B						
Dunns Crossing Rd / Brookside Rd	West	T	8	11.5	B	14	38.1	E			
Dunns Crossing Rd / Brookside Rd	West	R	4	38.1	E						
Dunns Crossing Rd / Burmham School Rd	North	L	5	7.3	A						
Dunns Crossing Rd / Burmham School Rd	North	T	466	6.6	A	484	6.8	A			
Dunns Crossing Rd / Burmham School Rd	North	R	14	13.4	B						
Dunns Crossing Rd / Burmham School Rd	East	L	0	-	-						
Dunns Crossing Rd / Burmham School Rd	East	T	2	14.1	B	2	18.1	B			
Dunns Crossing Rd / Burmham School Rd	East	R	1	28.1	C				1107	10.1	A
Dunns Crossing Rd / Burmham School Rd	South	L	208	8.7	A						
Dunns Crossing Rd / Burmham School Rd	South	T	229	9.3	A	439	9.0	A			
Dunns Crossing Rd / Burmham School Rd	South	R	2	12.5	B						
Dunns Crossing Rd / Burmham School Rd	West	L	13	14.6	B						
Dunns Crossing Rd / Burmham School Rd	West	T	1	33.8	C	181	21.1	C			
Dunns Crossing Rd / Burmham School Rd	West	R	167	21.5	C						
Dunns Crossing Rd / SH 1	North	L	91	11.8	B						
Dunns Crossing Rd / SH 1	North	T	130	14.7	B	248	13.6	B			
Dunns Crossing Rd / SH 1	North	R	27	14.2	B						
Dunns Crossing Rd / SH 1	East	L	657	9.8	A						
Dunns Crossing Rd / SH 1	East	T	743	10.4	A	1479	10.0	A			
Dunns Crossing Rd / SH 1	East	R	79	8.5	A				2882	8.8	A
Dunns Crossing Rd / SH 1	South	L	81	4.0	A						
Dunns Crossing Rd / SH 1	South	T	89	4.8	A	328	5.6	A			
Dunns Crossing Rd / SH 1	South	R	158	6.8	A						
Dunns Crossing Rd / SH 1	West	L	27	4.5	A						
Dunns Crossing Rd / SH 1	West	T	662	6.6	A	827	6.5	A			
Dunns Crossing Rd / SH 1	West	R	138	6.2	A						
Lowes Rd / Tennyson St	North	L	30	58.4	E						
Lowes Rd / Tennyson St	North	T	605	59.6	E	693	58.7	E			
Lowes Rd / Tennyson St	North	R	59	49.3	D						
Lowes Rd / Tennyson St	East	L	298	15.6	B						
Lowes Rd / Tennyson St	East	T	208	27.6	C	541	21.5	C			
Lowes Rd / Tennyson St	East	R	35	34.7	C				2249	31.7	C
Lowes Rd / Tennyson St	South	L	57	11.3	B						
Lowes Rd / Tennyson St	South	T	554	17.1	B	781	16.4	B			
Lowes Rd / Tennyson St	South	R	170	15.9	B						
Lowes Rd / Tennyson St	West	L	34	19.8	B						
Lowes Rd / Tennyson St	West	T	160	25.2	C	235	26.8	C			
Lowes Rd / Tennyson St	West	R	40	39.1	D						

A.3 'With Plan Change' Model AM Peak

Intersection	Approach	Mvt	Movement			Approach			Intersection		
			Vol	Delay	LoS	Vol	Delay	LoS	Vol	Delay	LoS
Selwyn Rd / Dunns Crossing Rd	North	L	272	2.1	A	350	2.1	A	779	3.5	A
Selwyn Rd / Dunns Crossing Rd	North	T	52	1.8	A						
Selwyn Rd / Dunns Crossing Rd	North	R	27	1.7	A						
Selwyn Rd / Dunns Crossing Rd	East	L	7	2.1	A	228	3.2	A			
Selwyn Rd / Dunns Crossing Rd	East	T	142	3.0	A						
Selwyn Rd / Dunns Crossing Rd	East	R	79	3.6	A						
Selwyn Rd / Dunns Crossing Rd	South	L	0	-	-	84	12.1	B			
Selwyn Rd / Dunns Crossing Rd	South	T	78	12.1	B						
Selwyn Rd / Dunns Crossing Rd	South	R	6	12.5	B						
Selwyn Rd / Dunns Crossing Rd	West	L	46	1.6	A	117	2.1	A			
Selwyn Rd / Dunns Crossing Rd	West	T	71	2.4	A						
Selwyn Rd / Dunns Crossing Rd	West	R	0	-	-						
Dunns Crossing Rd / PC73 Road	North	L	42	1.8	A	328	6.6	A	986	20.9	C
Dunns Crossing Rd / PC73 Road	North	T	254	1.8	A						
Dunns Crossing Rd / PC73 Road	North	R	32	6.6	A						
Dunns Crossing Rd / PC73 Road	East	L	3	15.5	C	74	20.9	C			
Dunns Crossing Rd / PC73 Road	East	T	22	13.6	B						
Dunns Crossing Rd / PC73 Road	East	R	49	20.9	C						
Dunns Crossing Rd / PC73 Road	South	L	28	1.2	A	396	7.9	A			
Dunns Crossing Rd / PC73 Road	South	T	347	2.0	A						
Dunns Crossing Rd / PC73 Road	South	R	21	7.9	A						
Dunns Crossing Rd / PC73 Road	West	L	113	8.4	A	189	15.0	B			
Dunns Crossing Rd / PC73 Road	West	T	39	15.0	B						
Dunns Crossing Rd / PC73 Road	West	R	37	13.1	B						
Dunns Crossing Rd / Boulez Mews	North	L	2	1.3	A	255	5.0	A	1085	14.7	B
Dunns Crossing Rd / Boulez Mews	North	T	253	2.0	A						
Dunns Crossing Rd / Boulez Mews	North	R	0	5.0	A						
Dunns Crossing Rd / Boulez Mews	East	L	2	5.7	A	6	12.6	B			
Dunns Crossing Rd / Boulez Mews	East	T	1	6.8	A						
Dunns Crossing Rd / Boulez Mews	East	R	4	12.6	B						
Dunns Crossing Rd / Boulez Mews	South	L	54	1.8	A	571	2.7	A			
Dunns Crossing Rd / Boulez Mews	South	T	517	2.7	A						
Dunns Crossing Rd / Boulez Mews	South	R	1	1.5	A						
Dunns Crossing Rd / Boulez Mews	West	L	163	13.7	B	252	14.7	B			
Dunns Crossing Rd / Boulez Mews	West	T	1	14.7	B						
Dunns Crossing Rd / Boulez Mews	West	R	88	13.2	B						
Dunns Crossing Rd / Lowes Rd	North	L	250	9.3	A	541	10.3	A	1657	41.0	D
Dunns Crossing Rd / Lowes Rd	North	T	235	10.7	B						
Dunns Crossing Rd / Lowes Rd	North	R	56	13.5	B						
Dunns Crossing Rd / Lowes Rd	East	L	23	21.7	C	198	24.8	C			
Dunns Crossing Rd / Lowes Rd	East	T	40	22.8	C						
Dunns Crossing Rd / Lowes Rd	East	R	135	26.0	C						
Dunns Crossing Rd / Lowes Rd	South	L	0	-	-	714	29.0	C			
Dunns Crossing Rd / Lowes Rd	South	T	575	28.6	C						
Dunns Crossing Rd / Lowes Rd	South	R	139	30.8	C						
Dunns Crossing Rd / Lowes Rd	West	L	136	176.3	F	204	180.1	F			
Dunns Crossing Rd / Lowes Rd	West	T	67	187.9	F						
Dunns Crossing Rd / Lowes Rd	West	R	0	-	-						

Dunns Crossing Rd / Brookside Rd	North	L	42	3.3	A	543	7.4	A	1758	164.5	F
Dunns Crossing Rd / Brookside Rd	North	T	443	4.0	A						
Dunns Crossing Rd / Brookside Rd	North	R	58	7.4	A						
Dunns Crossing Rd / Brookside Rd	East	L	77	4.5	A	132	20.6	C			
Dunns Crossing Rd / Brookside Rd	East	T	40	20.6	C						
Dunns Crossing Rd / Brookside Rd	East	R	15	16.1	C						
Dunns Crossing Rd / Brookside Rd	South	L	4	8.6	A	870	17.8	C			
Dunns Crossing Rd / Brookside Rd	South	T	645	6.1	A						
Dunns Crossing Rd / Brookside Rd	South	R	221	17.8	C						
Dunns Crossing Rd / Brookside Rd	West	L	125	41.7	E	213	164.5	F			
Dunns Crossing Rd / Brookside Rd	West	T	57	164.5	F						
Dunns Crossing Rd / Brookside Rd	West	R	31	87.1	F						
Dunns Crossing Rd / Burmham School Rd	North	L	2	1.4	A	243	14.8	B	1382	25.8	C
Dunns Crossing Rd / Burmham School Rd	North	T	228	14.0	B						
Dunns Crossing Rd / Burmham School Rd	North	R	13	30.2	C						
Dunns Crossing Rd / Burmham School Rd	East	L	0	-	-	9	25.6	C			
Dunns Crossing Rd / Burmham School Rd	East	T	4	27.0	C						
Dunns Crossing Rd / Burmham School Rd	East	R	5	24.4	C						
Dunns Crossing Rd / Burmham School Rd	South	L	217	26.1	C	793	28.9	C			
Dunns Crossing Rd / Burmham School Rd	South	T	573	29.9	C						
Dunns Crossing Rd / Burmham School Rd	South	R	3	25.0	C						
Dunns Crossing Rd / Burmham School Rd	West	L	56	18.1	B	337	26.4	C			
Dunns Crossing Rd / Burmham School Rd	West	T	11	13.4	B						
Dunns Crossing Rd / Burmham School Rd	West	R	270	28.6	C						
Dunns Crossing Rd / SH1	North	L	99	16.1	B	171	19.0	B	2803	24.2	C
Dunns Crossing Rd / SH1	North	T	58	21.9	C						
Dunns Crossing Rd / SH1	North	R	15	27.9	C						
Dunns Crossing Rd / SH1	East	L	95	5.5	A	985	6.7	A			
Dunns Crossing Rd / SH1	East	T	806	7.0	A						
Dunns Crossing Rd / SH1	East	R	84	5.6	A						
Dunns Crossing Rd / SH1	South	L	151	48.7	D	944	53.0	D			
Dunns Crossing Rd / SH1	South	T	115	46.0	D						
Dunns Crossing Rd / SH1	South	R	678	55.2	D						
Dunns Crossing Rd / SH1	West	L	48	9.1	A	703	11.4	B			
Dunns Crossing Rd / SH1	West	T	563	11.4	B						
Dunns Crossing Rd / SH1	West	R	92	12.3	B						
Lowes Rd / Tennyson St	North	L	26	19.5	B	356	17.1	B	1998	20.7	C
Lowes Rd / Tennyson St	North	T	308	17.4	B						
Lowes Rd / Tennyson St	North	R	22	10.8	B						
Lowes Rd / Tennyson St	East	L	105	11.4	B	204	17.2	B			
Lowes Rd / Tennyson St	East	T	89	21.9	C						
Lowes Rd / Tennyson St	East	R	10	35.4	C						
Lowes Rd / Tennyson St	South	L	48	15.6	B	920	18.8	B			
Lowes Rd / Tennyson St	South	T	634	20.1	B						
Lowes Rd / Tennyson St	South	R	238	16.1	B						
Lowes Rd / Tennyson St	West	L	134	24.8	C	518	27.7	C			
Lowes Rd / Tennyson St	West	T	322	28.4	C						
Lowes Rd / Tennyson St	West	R	63	30.4	C						

A.4 'With Plan Change' Model PM Peak

Intersection	Approach	Mvt	Movement			Approach			Intersection		
			Vol	Delay	LoS	Vol	Delay	LoS	Vol	Delay	LoS
Selwyn Rd / Dunns Crossing Rd	North	L	140	1.9	A	232	1.8	A	845	4.2	A
Selwyn Rd / Dunns Crossing Rd	North	T	82	1.6	A						
Selwyn Rd / Dunns Crossing Rd	North	R	10	1.4	A						
Selwyn Rd / Dunns Crossing Rd	East	L	6	3.4	A	367	4.4	A			
Selwyn Rd / Dunns Crossing Rd	East	T	123	3.8	A						
Selwyn Rd / Dunns Crossing Rd	East	R	238	4.8	A						
Selwyn Rd / Dunns Crossing Rd	South	L	0	-	-	77	13.0	B			
Selwyn Rd / Dunns Crossing Rd	South	T	72	13.1	B						
Selwyn Rd / Dunns Crossing Rd	South	R	6	12.0	B						
Selwyn Rd / Dunns Crossing Rd	West	L	86	2.5	A	168	2.9	A			
Selwyn Rd / Dunns Crossing Rd	West	T	82	3.4	A						
Selwyn Rd / Dunns Crossing Rd	West	R	0	-	-						

Dunns Crossing Rd / PC73 Road	North	L	64	3.2	A	498	7.8	A	1041	18.9	C
Dunns Crossing Rd / PC73 Road	North	T	362	1.8	A						
Dunns Crossing Rd / PC73 Road	North	R	72	7.8	A						
Dunns Crossing Rd / PC73 Road	East	L	6	10.3	A	114	18.9	C			
Dunns Crossing Rd / PC73 Road	East	T	37	15.7	C						
Dunns Crossing Rd / PC73 Road	East	R	71	18.9	C						
Dunns Crossing Rd / PC73 Road	South	L	42	1.0	A	356	8.2	A			
Dunns Crossing Rd / PC73 Road	South	T	305	2.0	A						
Dunns Crossing Rd / PC73 Road	South	R	9	8.2	A						
Dunns Crossing Rd / PC73 Road	West	L	28	6.0	A	74	14.8	B			
Dunns Crossing Rd / PC73 Road	West	T	24	14.1	B						
Dunns Crossing Rd / PC73 Road	West	R	22	14.8	B						
Dunns Crossing Rd / Boulez Mews	North	L	4	1.6	A	498	6.2	A	1002	12.0	B
Dunns Crossing Rd / Boulez Mews	North	T	492	2.0	A						
Dunns Crossing Rd / Boulez Mews	North	R	2	6.2	A						
Dunns Crossing Rd / Boulez Mews	East	L	1	5.4	A	3	6.8	A			
Dunns Crossing Rd / Boulez Mews	East	T	0	6.8	A						
Dunns Crossing Rd / Boulez Mews	East	R	2	5.9	A						
Dunns Crossing Rd / Boulez Mews	South	L	71	2.5	A	417	3.7	A			
Dunns Crossing Rd / Boulez Mews	South	T	344	2.8	A						
Dunns Crossing Rd / Boulez Mews	South	R	2	3.7	A						
Dunns Crossing Rd / Boulez Mews	West	L	18	12.0	B	84	12.0	B			
Dunns Crossing Rd / Boulez Mews	West	T	1	11.4	B						
Dunns Crossing Rd / Boulez Mews	West	R	65	11.8	B						
Dunns Crossing Rd / Lowes Rd	North	L	192	9.9	A	835	12.1	B	1641	15.3	B
Dunns Crossing Rd / Lowes Rd	North	T	460	12.3	B						
Dunns Crossing Rd / Lowes Rd	North	R	184	14.1	B						
Dunns Crossing Rd / Lowes Rd	East	L	41	38.6	D	230	40.5	D			
Dunns Crossing Rd / Lowes Rd	East	T	77	38.7	D						
Dunns Crossing Rd / Lowes Rd	East	R	113	42.3	D						
Dunns Crossing Rd / Lowes Rd	South	L	0	-	-	377	9.0	A			
Dunns Crossing Rd / Lowes Rd	South	T	345	8.8	A						
Dunns Crossing Rd / Lowes Rd	South	R	32	11.0	B						
Dunns Crossing Rd / Lowes Rd	West	L	129	10.7	B	199	11.3	B			
Dunns Crossing Rd / Lowes Rd	West	T	70	12.5	B						
Dunns Crossing Rd / Lowes Rd	West	R	0	13.3	B						
Dunns Crossing Rd / Brookside Rd	North	L	14	6.0	A	794	9.3	A	1771	29.4	D
Dunns Crossing Rd / Brookside Rd	North	T	637	7.6	A						
Dunns Crossing Rd / Brookside Rd	North	R	142	9.3	A						
Dunns Crossing Rd / Brookside Rd	East	L	187	8.1	A	270	29.4	D			
Dunns Crossing Rd / Brookside Rd	East	T	75	29.4	D						
Dunns Crossing Rd / Brookside Rd	East	R	8	27.3	D						
Dunns Crossing Rd / Brookside Rd	South	L	9	7.6	A	588	9.7	A			
Dunns Crossing Rd / Brookside Rd	South	T	448	2.3	A						
Dunns Crossing Rd / Brookside Rd	South	R	130	9.7	A						
Dunns Crossing Rd / Brookside Rd	West	L	62	4.4	A	119	20.3	C			
Dunns Crossing Rd / Brookside Rd	West	T	49	17.4	C						
Dunns Crossing Rd / Brookside Rd	West	R	9	20.3	C						
Dunns Crossing Rd / Burmham School Rd	North	L	5	3.7	A	617	7.0	A	1335	10.2	A
Dunns Crossing Rd / Burmham School Rd	North	T	601	6.9	A						
Dunns Crossing Rd / Burmham School Rd	North	R	11	11.2	B						
Dunns Crossing Rd / Burmham School Rd	East	L	0	-	-	2	15.0	B			
Dunns Crossing Rd / Burmham School Rd	East	T	2	15.0	B						
Dunns Crossing Rd / Burmham School Rd	East	R	0	-	-						
Dunns Crossing Rd / Burmham School Rd	South	L	219	9.2	A	519	9.9	A			
Dunns Crossing Rd / Burmham School Rd	South	T	297	10.4	A						
Dunns Crossing Rd / Burmham School Rd	South	R	3	12.9	B						
Dunns Crossing Rd / Burmham School Rd	West	L	10	14.4	B	197	21.2	C			
Dunns Crossing Rd / Burmham School Rd	West	T	3	14.2	B						
Dunns Crossing Rd / Burmham School Rd	West	R	185	21.7	C						

Dunns Crossing Rd / SH1	North	L	83	9.0	A						
Dunns Crossing Rd / SH1	North	T	131	12.3	B	239	11.5	B			
Dunns Crossing Rd / SH1	North	R	25	15.4	B						
Dunns Crossing Rd / SH1	East	L	748	10.9	B						
Dunns Crossing Rd / SH1	East	T	736	11.4	B	1556	11.0	B			
Dunns Crossing Rd / SH1	East	R	73	8.5	A						
Dunns Crossing Rd / SH1	South	L	92	4.5	A				3005	9.3	A
Dunns Crossing Rd / SH1	South	T	89	4.5	A	368	5.5	A			
Dunns Crossing Rd / SH1	South	R	188	6.5	A						
Dunns Crossing Rd / SH1	West	L	26	4.2	A						
Dunns Crossing Rd / SH1	West	T	665	7.3	A	841	7.1	A			
Dunns Crossing Rd / SH1	West	R	150	6.8	A						
Lowes Rd / Tennyson St	North	L	25	42.2	D						
Lowes Rd / Tennyson St	North	T	596	52.6	D	685	50.8	D			
Lowes Rd / Tennyson St	North	R	64	37.6	D						
Lowes Rd / Tennyson St	East	L	292	14.7	B						
Lowes Rd / Tennyson St	East	T	227	28.2	C	555	21.2	C			
Lowes Rd / Tennyson St	East	R	36	29.5	C						
Lowes Rd / Tennyson St	South	L	51	9.0	A				2187	29.1	C
Lowes Rd / Tennyson St	South	T	504	16.9	B	720	15.9	B			
Lowes Rd / Tennyson St	South	R	166	14.8	B						
Lowes Rd / Tennyson St	West	L	32	19.1	B						
Lowes Rd / Tennyson St	West	T	160	24.1	C	226	25.0	C			
Lowes Rd / Tennyson St	West	R	35	34.1	C						

A.5 Dunns Crossing Road / Lowes Road Roundabout Sidra Modelling

Sidra Model Results- AM Simulation Model Traffic Volume Outputs (without Realignment of Brookside Road)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing S														
1	L2	1	0.0	1	0.0	0.665	6.0	LOS A	6.9	48.1	0.72	0.68	0.76	45.0
2	T1	575	0.0	605	0.0	0.665	6.0	LOS A	6.9	48.1	0.72	0.68	0.76	45.9
3	R2	139	0.0	146	0.0	0.665	9.9	LOS A	6.9	48.1	0.72	0.68	0.76	45.9
Approach		715	0.0	753	0.0	0.665	6.8	LOS A	6.9	48.1	0.72	0.68	0.76	45.9
East: Lowes Rd														
4	L2	23	0.0	24	0.0	0.209	4.9	LOS A	1.2	8.7	0.53	0.65	0.53	44.9
5	T1	40	0.0	42	0.0	0.209	4.9	LOS A	1.2	8.7	0.53	0.65	0.53	45.8
6	R2	135	0.0	142	0.0	0.209	8.8	LOS A	1.2	8.7	0.53	0.65	0.53	45.8
Approach		198	0.0	208	0.0	0.209	7.6	LOS A	1.2	8.7	0.53	0.65	0.53	45.7
North: Dunns Crossing N														
7	L2	250	0.0	263	0.0	0.500	4.8	LOS A	3.9	27.5	0.58	0.59	0.58	45.9
8	T1	235	0.0	247	0.0	0.500	4.8	LOS A	3.9	27.5	0.58	0.59	0.58	46.8
9	R2	56	0.0	59	0.0	0.500	8.7	LOS A	3.9	27.5	0.58	0.59	0.58	46.8
Approach		541	0.0	569	0.0	0.500	5.2	LOS A	3.9	27.5	0.58	0.59	0.58	46.3
West: Plan Change Rd														
10	L2	136	0.0	143	0.0	0.398	11.2	LOS B	3.0	20.8	0.92	0.96	0.97	43.1
11	T1	67	0.0	71	0.0	0.398	11.2	LOS B	3.0	20.8	0.92	0.96	0.97	43.9
12	R2	1	0.0	1	0.0	0.398	15.1	LOS B	3.0	20.8	0.92	0.96	0.97	43.9
Approach		204	0.0	215	0.0	0.398	11.2	LOS B	3.0	20.8	0.92	0.96	0.97	43.4
All Vehicles		1658	0.0	1745	0.0	0.665	6.9	LOS A	6.9	48.1	0.68	0.68	0.70	45.7

Sidra Model Results- AM With Brookside Road West Realigned

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing S														
1	L2	1	0.0	1	0.0	0.740	9.4	LOS A	9.6	67.5	0.86	0.90	1.08	43.7
2	T1	575	0.0	605	0.0	0.740	9.4	LOS A	9.6	67.5	0.86	0.90	1.08	44.5
3	R2	139	0.0	146	0.0	0.740	13.3	LOS B	9.6	67.5	0.86	0.90	1.08	44.5
Approach		715	0.0	753	0.0	0.740	10.2	LOS B	9.6	67.5	0.86	0.90	1.08	44.5
East: Lowes Rd														
4	L2	23	0.0	24	0.0	0.237	5.6	LOS A	1.5	10.4	0.62	0.71	0.62	44.6
5	T1	44	0.0	46	0.0	0.237	5.6	LOS A	1.5	10.4	0.62	0.71	0.62	45.5
6	R2	135	0.0	142	0.0	0.237	9.5	LOS A	1.5	10.4	0.62	0.71	0.62	45.5
Approach		202	0.0	213	0.0	0.237	8.2	LOS A	1.5	10.4	0.62	0.71	0.62	45.4
North: Dunns Crossing N														
7	L2	250	0.0	263	0.0	0.608	5.5	LOS A	5.5	38.4	0.69	0.67	0.70	45.3
8	T1	235	0.0	247	0.0	0.608	5.5	LOS A	5.5	38.4	0.69	0.67	0.70	46.2
9	R2	154	0.0	162	0.0	0.608	9.4	LOS A	5.5	38.4	0.69	0.67	0.70	46.2
Approach		639	0.0	673	0.0	0.608	6.4	LOS A	5.5	38.4	0.69	0.67	0.70	45.9
West: Plan Change Rd														
10	L2	318	0.0	335	0.0	0.857	34.8	LOS C	14.2	99.1	1.00	1.51	2.16	33.7
11	T1	98	0.0	103	0.0	0.857	34.8	LOS C	14.2	99.1	1.00	1.51	2.16	34.2
12	R2	1	0.0	1	0.0	0.857	38.7	LOS D	14.2	99.1	1.00	1.51	2.16	34.2
Approach		417	0.0	439	0.0	0.857	34.8	LOS C	14.2	99.1	1.00	1.51	2.16	33.8
All Vehicles		1973	0.0	2077	0.0	0.857	14.0	LOS B	14.2	99.1	0.81	0.93	1.14	42.2

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