

Davie, Lovell-Smith Ltd 116 Wrights Road, Addington PO Box 679, Christchurch 8140 New Zealand Telephone (03) 379-0793 E-mail: office@dls.co.nz

16 June 2021

Jonathon Clease – Consultant Planner Selwyn District Council

By mail: jonathan@planzconsultants.co.nz>

RE PLAN CHANGE 68 - RESPONSE TO REQUEST FOR FURTHER INFORMATION

Further to your request for further information (RFI) of 28 April 2021 relating to proposed Plan Change 68 Request we set out responses to each of the specific requests below. The response below refers to the item numbering of the RFI questions. The following documents are attached to this Response:

Attachment A: Amended Outline Development Plan R4

Attachment B: Updated Urban Economics "Economic Assessment for Proposed Rezoning of Land in

West Prebbleton" dated 15.06.2021

Attachment C: Abley Note: "Plan Change 68 Response to Council Transport Comments"

dated 31 May 2021

Attachment D: Abley Revised Integrated Traffic Assessment dated, 31 May 2021

Attachment E - Maahanui Kurataiao Ltd report

Assessment of PC 68 under Policy B4.3.3 - Items 1, 2, and 3

Items 1 and 2 - Policy 4.3.3

Policy B4.3.3 states

Avoid zoning patterns that leave land zoned Rural surrounded on three or more boundaries with land zoned Living or Business.

Response

Only one of the five sites in the block involving 382 – 414 Trents Road is surrounded on three sides with Residential zoning if the proposed rezoning occurs. This is the eastern property of 414 Trents Road. It is noted in this regard that the Kingcraft EDA is not a residential zoning in the Operative District Plan and this approach has been continued into the Proposed District Plan. Regarding the western end of Trents Road, only one of the sites (330 Trents Road) will have Residential zoning on three sides if the proposed rezoning occurs. These properties have not been included as the property owners having been approached by the applicants advised that they did wish to be invovled in the rezoning. It was considered inappropriate to include land owners in a rezoning exercise when they did not wish to do so.

With regard to the purpose of Policy 4.3.3 it is noted that the Explanation and Reasons for the policy states:

RESOURCE MANAGEMENT, ENVIRONMENTAL PLANNING, LAND SURVEYING AND DEVELOPMENT, CIVIL AND ENVIRONMENTAL ENGINEERING

Established 1880 DIRECTORS: Martin Hayes NZCLS, BSurv(Dist), MNZIS, RPSurv, Andy Hall BSurv, BE(Hons), CMEngNZ, CPEng Mark Brown BA, PGDip, MRRP



"To achieve Objective B4.3.2, any land rezoned for new residential or business development in areas outside the Greater Christchurch area should adjoin an existing township zone along at least one boundary, except in the case of low density residential development located around townships that achieve a compact and consolidated town shape. The new zoning pattern should also avoid leaving a patch of land zoned 'Rural' surrounded by Living or Business zones. Such a land zoning pattern can increase the potential for 'reverse sensitivity' issues between the site and adjoining zones. It also makes the provision of utilities and services more difficult, because it is uncertain whether this land will be rezoned in the future. In turn there are uncertainties about whether pipes and cables installed past the boundary should include capacity to serve the area, and, if so, who pays for it.

Objective B4.3.2 relates only to land outside the Greater Christchurch Area so on this basis alone it appears the policy was not intended to apply to Prebbleton. Logically the matters of most importance are those referred to in the Explanation being the desire to achieve a compact and consolidated urban form, avoid reverse sensitivity issues and enable efficient infrastructure provision. With regard to compactness the area proposed to be rezoned is large and is a logical extension of Prebbleton to the south west. This will retain the compactness of the Prebbleton and provides for consolidation. The exclusion of two areas within the block, including the two lots which will have three residential zoned neighbours, from the proposed rezoning does not compromise this compactness because it does not result in a disconnected extension of the town.

There will be potential for reverse sensitivity issues to arise within the block as likely already occurs in blocks containing a mixture of lot sizes used for a range of activities including residential. This is an unavoidable when towns extend. Even if the full area is rezoned current landowners may wish to remain and carry out rural activities on their sites. With regard to the specific rural sites having three residential zone neighbours it is noted that 414 already has its full eastern boundary adjoining the Sterling Park development so the rezoning will only change this situation in relation to their southern boundary. 330 Trents Road appears to be used only for residential use and pasture and so is unlikely to create effects that affect the amenity of new residents. Finally the efficient servicing of block is not anticipated to be impeded by the exclusion of the specific properties within the block.

Consistency of boundaries - Item 3

In response to the query regarding the use of different boundaries by the technical reports attached to the Plan Change request the only report which contains different boundaries is the Infrastructure Report. The plans in this Report cover the full block in order for the topography of the sites to be understood. However the key services such as the sewer pump stations fall within the area proposed to be rezoned ensuring that this key element is feasible. All the other servicing will largely following the roading pattern which is shown in the ODP.

Clarification of expected yield and permitted lot sizes - Items 4 - 6

The Economic Assessment reference to lots between 200m2-700m² refers to the main areas within the land being rezoned. The applicants are fully aware that low density and medium density (Small Lot) do not provide for lots less than 400m2. The reference to smaller lots down to a lot size of 200m2 is referring to the fact that the zoning provides for Medium density Comprehensive Development for which there is no minimum lot size. The location of comprehensive developments is not identified in the ODP for the following reasons. Comprehensive developments can only be achieved by resource consent and so it is not possible to specify in the ODP and associated rules where and how they are to occur at this stage. In addition the placing of comprehensive development within a subdivision is a very nuanced matter which requires account to be taken of a number of important factors including provision of open space (which may not necessarily be in the form of Council reserves). This can only be done at the time detailed subdivision layout analysis is undertaken.



The yield of 12 houses per hectare is proposed in the rezoning request as a requirement for this area. That can be achieved in a number of ways and is a driver for creation of smaller lots alongside the more common medium and larger lots that are in demand. This approach therefore enables and encourages a range of lots but as referred to above the identification of the number and location of smaller lots can only be determined in the context of a detailed subdivision design process.

For the reasons set out above it is considered that there is no need to amend the economic and landscape assessment in relation to the specified minimum yield of 820.

Economic Assessment and housing affordability – Items 7-10

Items 7-9

The Economics Report by Urban Economics has been amended by updating statistics relating to building consents and further modelling of the anticipated size and price range of new dwellings within Prebbleton, and in particular within the PC68 rezoning area, based on the updated statistics – Refer **Attachment B**. This modelling is based on detailed analysis of housing statistics over time. This analysis has found a predictable pattern of new housing development in relation to lot sizes, their values and the value of dwelling placed on lots of various sizes as detailed in the Urban Economics report. The additional modelling based on updated building consent data shows that while the proportion of housing at each lot size remains the same the lot and dwelling price is greater, which reflects the increase in prices that has been experienced in recent times. Due to these price increases proportionally there will less housing in the affordable range, again reflecting what has occurred in recent times. Importantly however the proportion of houses in the lower three price brackets is boosted by the proposed development, thus providing benefit for people wishing to buy in these lower price brackets that would not otherwise occur.

Regarding Item 9 no additional mechanism is proposed or considered necessary to achieve this pattern of housing stock other than the stated commitment to develop to at a minimum density of 12 household per hectare. Experience indicates that this density will inevitably result in a range of lot sizes with small lots needed to offset the lower density larger lots as occurs in all larger scale developments working to this minimum density requirement. This result is confirmed by the analysis undertaken by Urban Economics.

Item 10

The updated Housing and Business assessment for housing sufficiency recently adopted by the Selwyn District Council confirms two important changes to previous supply data. These changes are that the long term demand (2020-2050) for additional houses of 24,000 which had a surplus of 6,617 has now been reduced to 2,543. In the medium term the surplus which is in fact a deficit, increases from 2,737 to -12,483. These changes have resulted from much greater uptake of existing lots than foreseen. This situation means housing demand has been underestimated and that more land is needed for development within Greater Christchurch sooner and over the full planning period.

With regard to Policy 8 it is not possible for a detailed analysis of all the plan change requests to be undertaken by the applicant as details of these are not readily available. Logically the combination of these plan changes, even if only some are approved will, in combination, more than satisfy the requirement in Policy 8 of the NPS-UD in relation to constituting significant development capacity. As a matter of good planning there appears to be only advantages, and no obvious disadvantages, in providing for more zoned land than is predicted by councils to be required in the short/medium term. This is particularly relevant as current growth rates and trends in the housing market have shown there to be a significant underestimate of demand as evidenced by very high levels of take-up of new lots on the market and significant increases in house prices. This



underestimate has meant that the amount of land anticipated to be required for the medium term has been shown to be insufficient even for some of the short term demand.

There is no recognised criterion or criteria for determining what is "significant" however Urban Economics in their report suggest that it is not just a quantitative matter but also qualitative. In particular if there is a housing issue within a community (including affordability) then supplying residential lots for development is significant because it will assist in meeting the Objectives the NPS-UD and in particular Objectives 1, 2, and 3.

Planning assessment - Items 11-15

Item 11

With regard to the contribution of the requested rezoning to the "function of the wider environment of the Prebbleton township, the surrounding district and Greater Christchurch area" we comment:

- The additional zoned land will provide for a variety of housing types and densities which may not be available in other areas and in particular may not be available at an affordable price. It therefore is complementary to other parts of Greater Christchurch
- The area to be rezoned adjoins roads with direct connections to adjoining areas and townships within Greater Christchurch. This creates good accessibility between home, work, schools and other community facilities within Greater Christchurch.
- Commuting from the rezoned area will involve generation of greenhouse gas emissions. This effect will
 be similar to commuting to and from other areas within Greater Christchurch. This approach does not
 fully support a "well-functioning urban environment" but neither do most of the available alternatives.

Item 12

It is noted that as PC 68 was lodged with SDC prior to the public notification of Proposed Change 1 to the Canterbury Regional Policy Statement that it was not addressed in the plan change request. The streamlined process has not yet advanced to the point where it is a directly relevant consideration, however the following comments are provided.

Proposed Change 1 simply adds to the areas identified on Map A and incorporates some of the policy and wording of the National Policy Statement on Urban Development. Within Selwyn District the only new areas (future development areas) identified are extensions to Rolleston. In keeping with the current approach of the CRPS there is no acknowledgement of the role that Prebbleton has and can play in providing for the current and likely future demand for housing. No justification for this limited and exclusive approach is provided anywhere in the CRPS, Proposed Change 1 or background documents. Given the obvious social need for housing now and in the medium and longer term this omission potentially puts the CRPS at odds with the NPS-UD. In particular it does not acknowledge the reduction in transport related emissions that would potentially occur if some development that was to occur in Rolleston was provided for in Prebbleton.

Item 13

Regarding the mitigation measures referred to in section 4 of the Landscape assessment:

MMI – Diversity of house and lot sizes – Refer response to Items 4-6. Please note that the reference to Living X is an error.

MM2 – The streetscapes within the development will be achieved through discussion with Council and conditions on the subdivision consent as is usual.



MM3 – The basis for the reserves is specified in the ODP however more detailed linkages and localized green spaces will occur through detailed subdivision design in consultation with SDC staff. This will be implemented through conditions of consent on the subdivision(s).

MM4 – Limitations on access onto Shands Road can be achieved through consideration of any subdivision and in the establishment of any residential activity. This consideration results from residential activities accessing arterial roads not being permitted under rule 10.8 and subdivision rule 12.1.4.21 which specifies the matters of discretion to be considered if such access is proposed including road safety (including cumulative effects), access design and alternatives. The amended ODP attached to this response as **Attachment A** also includes a prohibition on direct access to Shands Road.

MM5 - Provided for in the ODP

MM6 – Fencing location and design can be, and commonly is, dealt with through the subdivision process and subsequent covenants on individual titles.

Item 14

The Plan Change does not address in detail whether individual lots will have access on the frontage roads as it is considered that this is most appropriately dealt with at a later stage. This is particularly so as the Council is currently undertaking roading planning and works which will have impacts on various traffic flows in the general area over time. In these circumstances decisions about access should be made on the basis of the then current environment and the anticipated future environment.

Item 15

Given the wide range of issues associated with the water races and other drainage infrastructure in the general area the applicants have not made any decision about how or whether the water race will be integrated into the development. As with access it is considered appropriate that these important decisions are made with a full understanding of the implications and available options and consultation with relevant local government entities.

Consultation Item 16

The applicants have consulted with tangata whenua through Mahaanui Kurataiao Limited and have received a response which is attached as **Attachment E** to the Response.

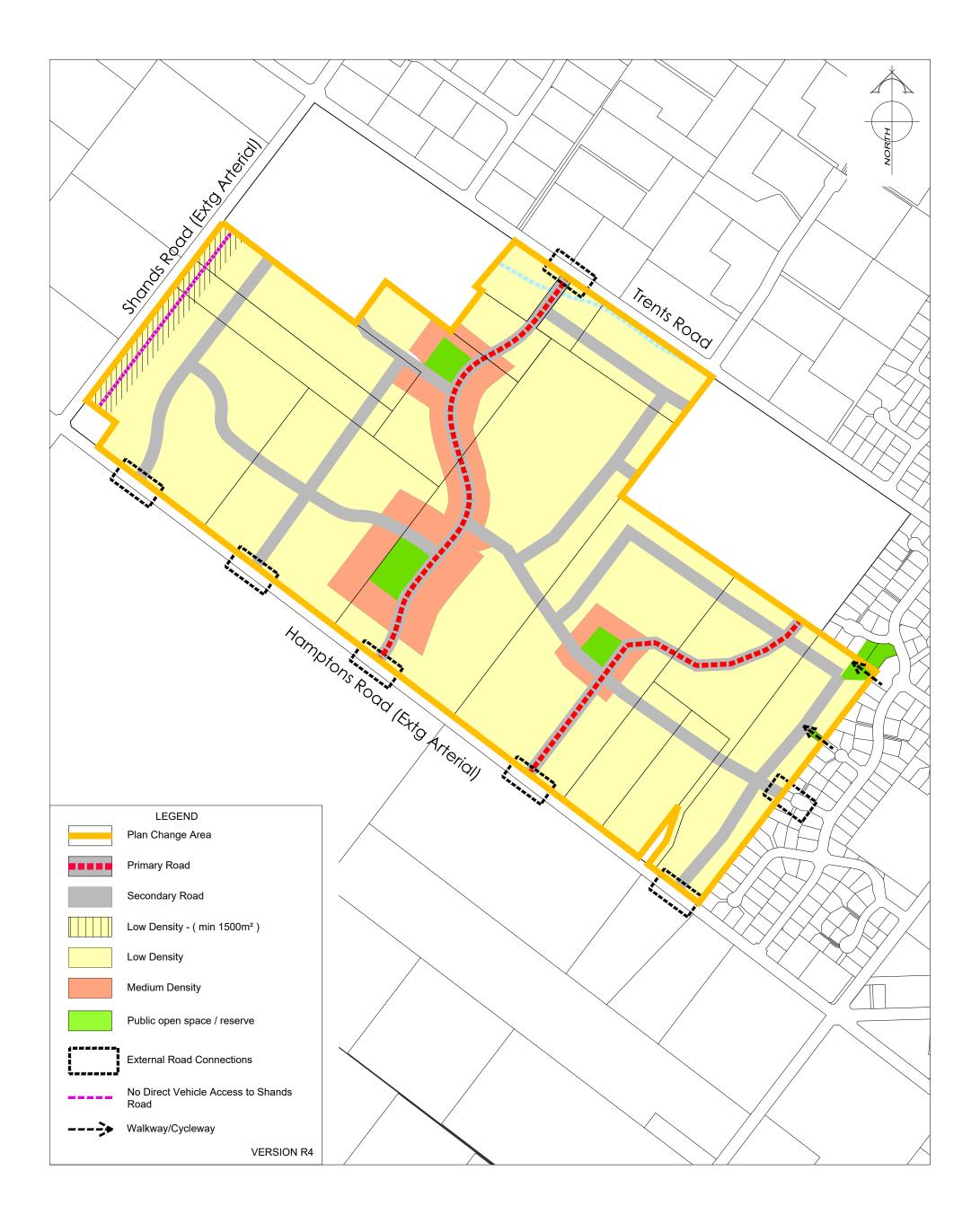
Council Transport Comments

In response to transport comments provided by Andrew Mazey of Selwyn District Council Abley consultants have updated their modelling and assessment of the traffic generation and its effects in the vicinity of the plan change site – refer **Attachment D.** In addition Abley have provided a Note responding to the individual points raised in the Transport comments provided – refer **Attachment C.**



ATTACHMENT A Amended PC 68 Outline Development Plan (R4)

Outline Development Plan - Prebbleton - South West





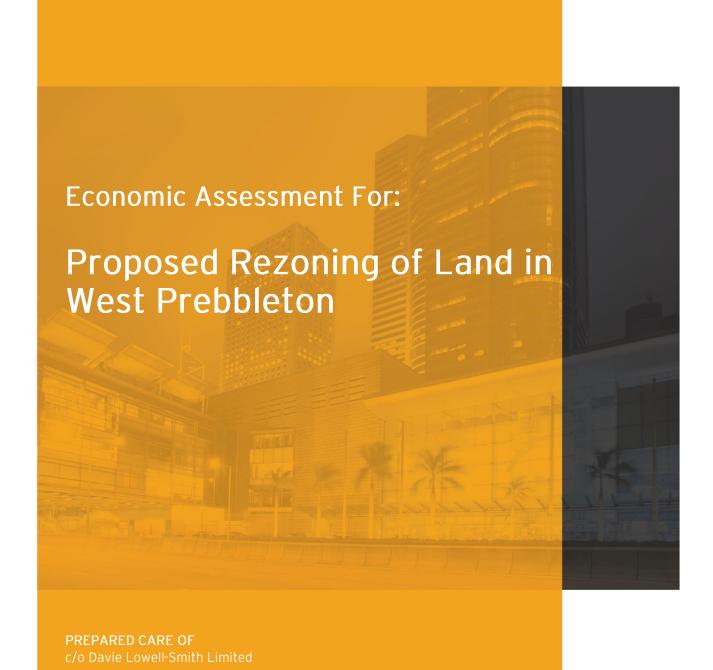
ATTACHMENT B

Updated Urban Economics "Economic Assessment for Proposed Rezoning of Land in West Prebbleton



15.06.2021

AUTHOR ADAM THOMPSON AND MATTHEW WILLIAMSON 51662.5.02





OUR AREAS OF EXPERTISE

Economic Analysis

Our work aims to bridge the gap between land-use planning and urban economics. Our focus is on the interaction between land markets, land-use regulations, and urban development. We have developed a range of methodologies using a quantitative approach to analyse urban spatial structure and audit land-use regulations.

Property Research

We provide property and retail market research to assist with planning and marketing of new projects. This includes identification of new sites and market areas, assessments of market potential and positioning, and the evaluation of market-feasibility of specific projects.

Development Advisory

We provide development planning and costing advisory services to support small and large-scale developments.

P: 09 963 8776

150 Foundry Road, Silverdale, Auckland

adam@ue.co.nz

www.ue.co.nz



CONTENTS

1.	KEY POINTS	4
2.	THE PROPOSAL	6
3.	EXISTING LAND USES	6
4.	HOUSING MARKET PROFILE	7
5.	URBAN AND RURAL LIFESTYLE HOUSING DEMAND AT PREBBLETON	9
6.	PREBBLETON DEVELOPMENT OPPORTUNITIES & CONSTRAINTS	9
7.	PLAN ENABLED CAPACITY	12
8.	COMMERCIALLY FEASIBLE INFILL CAPACITY	14
9.	GREENFIELD LAND CAPACITY	15
10.	YIELD FROM THE PROPOSED DEVELOPMENT	18
11.	POTENTIAL FUTURE HOUSING AT PREBBLETON BY PRICE & TYPE	18
12.	NPS-UD PROVISIONS	21
13.	INFRASTRUCTURE CONSIDERATIONS	22
14.	CONCLUSION	22
15.	APPENDIX 1: HOUSING CAPACITY ASSESSMENT METHODOLOGY	23
16.	APPENDIX 2: LOT SIZE AND LOT VALUE CORRELATION	24



1. Key Points

This report evaluates the economic impact of rezoning 67.5ha of General Rural zoned land in Prebbleton to Living Z.

The key points to note are:

- The current housing market in Prebbleton is expensive, with only 1% of dwellings priced below \$400,000, 15% of dwellings priced below \$600,000 and the vast majority (85%) of dwellings priced over \$600,000.
- The Selwyn Growth model (2017) used to inform the 2018 2028 Selwyn District Long Term Plan estimates that 400 additional households will reside in Prebbleton over the next decade. This indicates an underlying demand for around 40 new dwellings each year.
- Over the past decade Prebbleton has seen strong growth, with around 112 dwellings built annually based on Building Consent data, and for some years around 180 dwellings per annum. This indicates that the demand for housing is at least 2-3 times that estimated in the Selwyn District Long Term Plan, of only 40 dwellings per annum.
- There are only a small number of locations adjacent to the main urban area that have land values that are low enough to enable new urban developments that are feasible.
- The proposal encompasses one of only two feasible expansion locations for the town that do not require development to leapfrog an area of lifestyle blocks.
- Areas adjacent to the existing urban area are considered the most efficient locations for new development as they integrate directly with the existing urban area. The proposal site fits this description.
- There is practical potential for around 9 additional infill dwellings over the next decade.
- There is practical potential for around 117 additional greenfield dwellings over the next decade.
- The proposal enables a total of approximately 820 lots ranging in size from 200m² -1,000m².
- This wide range of lot sizes also enables a range of dwelling types and sizes. Enabling diversity of housing choice is a significant economic benefit.
- Future housing scenarios have been estimated for Prebbleton based on the existing stock, existing commercially feasible capacity and the impact of the proposal.
- Under the 'existing stock' scenario only 15% of dwellings are priced below \$600,000.
- Under the 'existing stock plus commercially feasible capacity' scenario, 14% of dwellings are priced at \$600,000 or less.



- Under the 'existing stock plus commercially feasible capacity and the proposed development' scenario, 21% of dwellings are priced under \$600,000.
- There is currently reasonably expected development capacity for an additional 126 dwellings. This is one year of demand.
- Currently the NPS-UD requirements for the short, medium and long term are not met for Prebbleton.
- The Prebbleton West Block will bring capacity for an additional 820 dwellings to the market. This would increase capacity to 8.4 years, which would enable the short-term and medium-term capacity requirements to be met. Under the higher demand scenario, of 140-180 dwellings per annum, this would represent 5-6 years capacity.



2. The Proposal

This report evaluates the economic costs and benefits of rezoning 67.5ha of land across fourteen properties between Shands, Hamptons and Trents Road. The properties are currently zoned Inner Plains (Rural). The zone change being sought is for the whole block of land to be rezoned Living Z.

Figure 1: Proposal Extent



3. Existing Land Uses

Prebbleton and its immediate 3km rural surrounds is comprised of:

- 20 rural properties comprising 560 hectares (21%),
- 410 lifestyle block properties comprising 1,780 hectares (67%),
- 1,710 residential properties comprising 230 hectares (9%), and
- 110 non-residential properties comprising 90 hectares (3%).

The main points to note are:

- Prebbleton is therefore dominated by lifestyle blocks, which account for two thirds of all land use.
- There are very few remaining rural properties, in the order of 20.
- The residential area accounts for 240 hectares.

¹ Property type as defined by Corelogic.



4. Housing Market Profile

Figure 2 shows the prices of the existing dwellings in Prebbleton. This is illustrated in Figure 2. The main points to note are:

- 1. Only 1% of dwellings are priced below \$400,000.
- 2. Only 15% of dwellings are priced below \$600,000.
- 3. The vast majority, 85%, of dwellings are priced at \$600,000 or more.

Figure 2: Prebbleton Residential Dwellings by Size and Price

Price Ranges	Count	Percentage
Under \$200k	2	0%
\$200k - \$400k	20	1%
\$400k - \$600k	245	14%
\$600k - \$800k	820	47%
\$800k - \$1m	340	20%
\$1m plus	301	17%
Total	1,728	100%

Source: Corelogic, Urban Economics



Figure 3 shows the distribution of dwellings by price. Most dwellings are \$600,000 plus (shown with orange-red) with a small cluster of dwellings worth between \$400,000 and \$600,000 (shown with light green) around the centre of Prebbleton.

Figure 3: Prebbleton Dwelling Price Map



Source: Selwyn Council, Urban Economics



5. Urban and Rural Lifestyle Housing Demand at Prebbleton

The Selwyn Growth model (2017) used to inform the 2018 - 2028 Selwyn District Long Term Plan estimates that 400 additional households will reside in Prebbleton over the next decade. This indicates an underlying demand for around 40 new dwellings each year.

Over the past decade Prebbleton has seen strong growth, with around 112 dwellings built annually based on Building Consent data. This indicates that the demand for housing is approximately 2-3 times that estimated in the Selwyn District Long Term Plan, of only 40 dwellings per annum.

Based on the recent construction trends, there is estimated demand for an additional 1,100 dwellings at Prebbleton over the next decade.

It is worth noting that as capacity has been exhausted, from around 2017-2018, the rate of new construction has declined, from around 140-180 per annum (2012-2017), to around 80 per annum (2018-2021). Additional capacity would result in this higher level of historical demand (140-180 per annum at its peak) to be in large part achieved, which could be in the order of 1,400 to 1,800 dwellings being demanded over the next decade².

Figure 4: Prebbleton Residential Building Consents 2012 - 2021 year ending April

Year	Number of Dwelling Units
2012	90
2013	180
2014	110
2015	140
2016	170
2017	110
2018	50
2019	70
2020	180
2021	20
Total	1,120
Annual	112

Source: Statistics NZ

6. Prebbleton Development Opportunities & Constraints

Figure 5 shows the land value, on per sqm basis, for all properties in Prebbleton. This is calculated as the total land value divided by the property area in square metres. This is a useful tool for evaluating the redevelopment potential of land, as higher land values are a constraint on development, as they increase the cost for a developer, and often mean that a new development is

² Household and Dwelling Construction and Price Trends in Christchurch, 2020, Urban Economics



not commercially feasible.

The main points to note are:

- There are a significant number of lifestyle blocks that surround the main urban area. These lifestyle blocks generally have a value of \$50+ per sqm.
- There are only a small number of locations adjacent to the main urban area that have land values of less than \$50 per sqm that would enable new urban developments. These are identified with yellow circles³.

It is evident that Prebbleton has very little remaining opportunity for new residential growth that is commercially feasible.

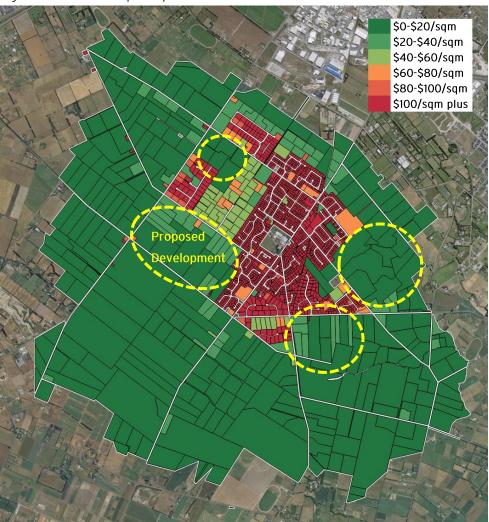


Figure 5: Land Value per Sqm

Source: Selwyn District Council, Corelogic, Urban Economics

³ This is the current value of greenfield development land in Selwyn District, with the implication being that higher prices would not be feasible.



Figure 6 shows the land area of each parcel in Prebbleton. The main points to note are:

- A large part of the Prebbleton urban area is bordered by Lifestyle Blocks of 1-2 hectares.
 This provides a de facto greenbelt for much of the town, as it is practically and commercially difficult to develop these properties into smaller residential properties (unless these blocks have been 'future proofed' on a comprehensive basis for future potential urban development).
- The areas identified with yellow circles show that there are only two feasible expansion locations for the town that do not require development to leapfrog an area of lifestyle blocks⁴.
- The areas identified in yellow show that there are two expansion locations for the town that do not require development to leapfrog an area of lifestyle blocks notwithstanding the potential aggregation of lifestyle blocks into larger development sites). These are efficient locations for new development as they integrate directly with the existing urban area. The proposed development is one of these locations and based on this preliminary analysis, is an optimal location for new housing in Prebbleton.

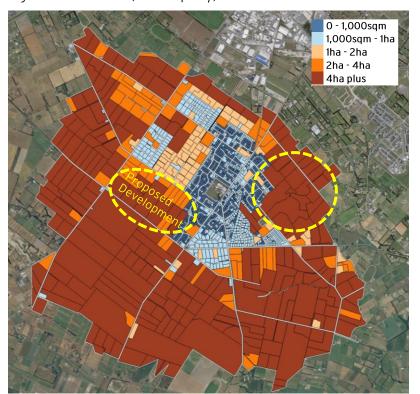


Figure 6: Land Area (Per Property)

Source: Corelogic, Urban Economics

51662.5.02

_

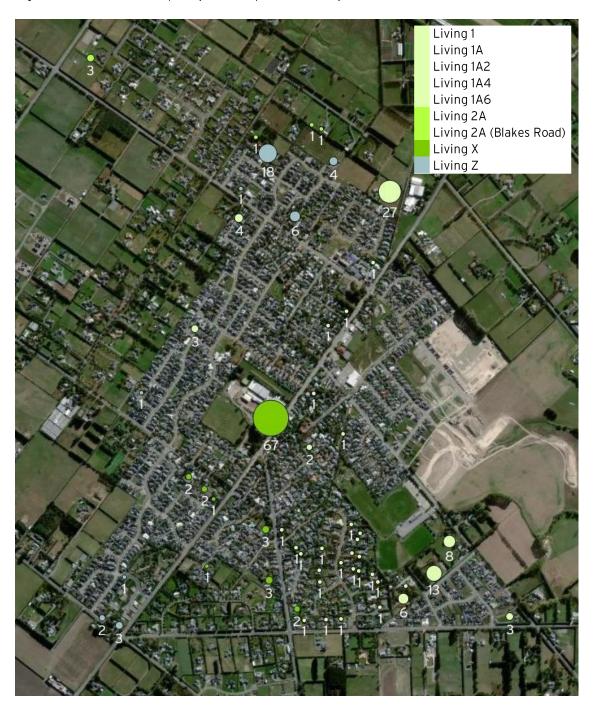
⁴ There may be opportunities for parcels to be aggregated which may result in a feasible development, however this can often be difficult if land owners are not willing to sell.



7. Plan Enabled Capacity

Plan enabled capacity refers to the capacity enabled under the Operative Selwyn District Plan provisions. Figure 7 shows the plan enabled capacity for each property in Prebbleton. It displays the minimum lot sizes in each zone. Figure 9 shows the zoning extents under the Operative Selwyn District Plan. As displayed in Figure 7 there is plan enabled capacity for 215 additional lots across the different zones.

Figure 7: Plan Enabled Capacity in the Operative Selwyn District Plan



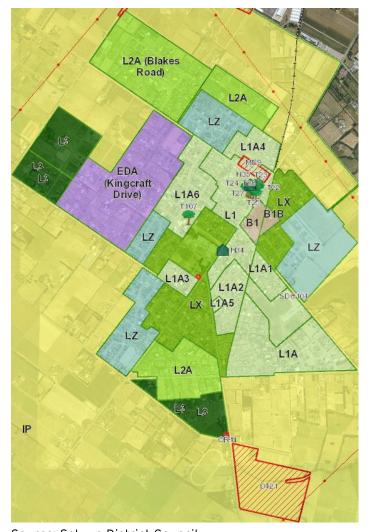
1

Figure 8: Residential Lot Sizes by Zone

Zone	Minimum average lot size (m²)	Minimum lot size (m²)
Living 1 *	800	-
Living 1A2 *	800	700
Living 1A6 - Comprehensive Residential Development	350	-
Living 1A6	550	450
Living 2 *	5,000	-
Living 2A (The Paddocks)	15,000	-
Living X	800	-
Living 3 (Hamptons Road)	5,000	4,000
Living 3 (Trents Road)	5,000	-
Living Z - Low Density	700	550
Living Z - Medium Density (Small Lot)	-	400

Source: Selwyn District Council Operative District Plan

Figure 9: Prebbleton Zoning Map



Source: Selwyn District Council

^{*} Subsequent subzone/s exists that largely share this zones characteristics



8. Commercially Feasible Infill Capacity

Figure 10 shows the number of estimated 'commercially feasible' infill lots and dwellings by lot size and price for Prebbleton under the Operative Selwyn District Plan. The results are illustrated in Figure 11. The key points to note are:

- 1. In total, there is potential for 23 commercially feasible infill⁵ dwellings in Prebbleton. Some of these properties would not be available for development, as the owners would not sell these properties over the next decade, this would imply that there is practical potential for around 9 additional infill dwellings over the next decade.
- 2. There are a range of lot sizes that are possible under the Operative Selwyn District Plan, ranging, in broad terms, from 700m² to 15,000m².
- 3. These lots would be priced between \$322,000 and \$705,000.
- 4. The dwellings that are likely to be built on these lots would result in a property value of \$644,000 to \$1.41 million. All the potential infill dwellings, however, would be priced around \$644,000 \$678,000.

Figure 10: Plan Enabled & Commercially Feasible Infill Lots by Lot Price

Lot Size	Lot Price	Dwelling Price	Feasible Dwellings	Feasible Dwellings %
700	\$322,000	\$644,000	17	74%
800	\$339,000	\$678,000	6	26%
875	\$350,000	\$700,000	0	0%
5,000	\$567,000	\$1,134,000	0	0%
15,000	\$705,000	\$1,410,000	0	0%
Total			23	100%

Source: Corelogic, Urban Economics

⁵ Infill development is defined as development that occurs on lots of 5,000m² or less, and greenfield development is development that occurs on lots of 5,000m² or greater.



Figure 11: Commercially Feasible Infill Lots



Source: Corelogic Database, Urban Economics

9. Greenfield Land Capacity

Figures 12 shows the estimated number of potential greenfield dwellings, by lot size and price for Prebbleton. The results are illustrated in Figure 13. The key points to note are:

- 1. In total, there is potential for 148 greenfield dwellings in Prebbleton. Some of these properties would not be available for development, as the owners would not sell these properties over the next decade, this would imply that there is practical potential for around 117 additional greenfield dwellings over the next decade.
- 2. There are a range of lot sizes that are possible under the District Plan, ranging, in broad terms, from 700m² to 15,000m².
- 3. These lots would be priced between \$322,000 and \$705,000.



4. The dwellings that are likely to be built on these lots would result in a property value of \$644,000 to \$1.41 million. The majority of the potential infill dwellings, however, would be priced around \$644,000 - \$700,000.

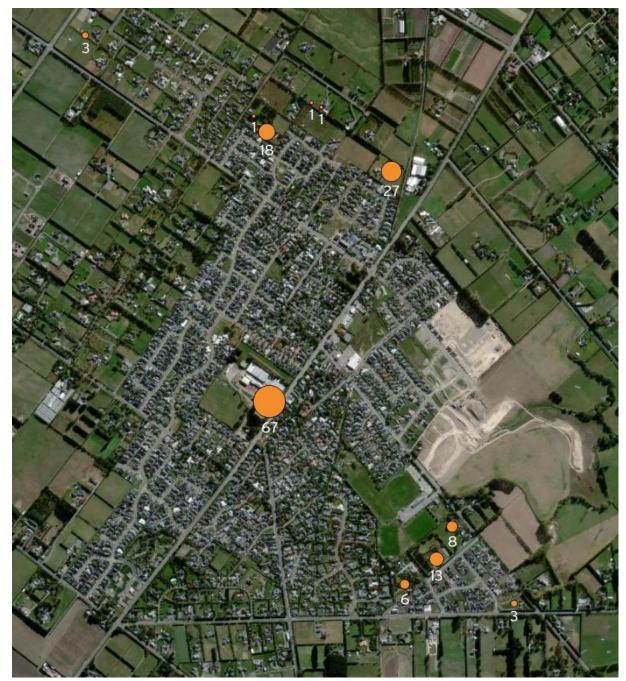
Figure 12: Greenfield Land Capacity

Lot Size	Lot Price	Dwelling Price	Feasible Dwellings	Feasible Dwellings %
700	\$322,000	\$644,000	18	12%
800	\$339,000	\$678,000	94	64%
875	\$350,000	\$700,000	30	20%
5,000	\$567,000	\$1,134,000	6	4%
15,000	\$705,000	\$1,410,000	0	0%
Total			148	100%

Source: Corelogic, Urban Economics



Figure 13: Greenfield Land Capacity



Source: Corelogic Database, Urban Economics



10. Yield from the Proposed Development

The proposal would enable the development of approximately 820 dwellings, on sites of 200 – 1,000m². Figure 13⁶ shows the estimated price of the proposed dwellings. The main points to note are:

- 1. The proposal enables approximately 820 lots ranging in size from 200m² 1,000m².
- 2. Approximately 3ha (37 lots) is planned to be developed at a lower density with lots ranging from $700m^2$ $1,000m^2$. With the remaining 64.5ha developed with lots ranging from $200m^2$ to $700m^2$.
- 3. Lot prices range from \$165,000 to \$366,000 and dwelling prices range from \$330,000 to \$732,000. There is clear evidence that shows smaller lots have a lower price and enable lower priced dwellings.
- 4. This wide range of lot sizes also enables a range of dwellings types and sizes. Enabling diversity of housing choice is a significant economic benefit for Prebbleton.

Figure 14: Possible Dwelling Yield on Proposed Site

Lot Size	Lot Count	Proportion	Lot Price	Dwelling Price
200	25	3%	\$165,000	\$330,000
300	50	6%	\$216,000	\$432,000
400	75	9%	\$252,000	\$504,000
500	140	17%	\$280,000	\$560,000
600	250	30%	\$303,000	\$606,000
700	255	31%	\$322,000	\$644,000
800	8	1%	\$339,000	\$678,000
900	8	1%	\$353,000	\$706,000
1,000	9	1%	\$366,000	\$732,000
Total	820	100%		

Source: Corelogic, Urban Economics

11. Potential Future Housing at Prebbleton by Price & Type

The following figures examine three future housing scenarios for Prebbleton. Data acquired from CoreLogic provides the basis for the existing stock from which the future housing scenarios were estimated.

The first is the **Existing Stock** scenario (the status quo). Under this scenario only 15% of dwellings are priced at \$600,000 or less.

The second is the Existing Stock plus Commercially Feasible Capacity scenario. This is the

⁶ This is an indicative yield mix that is consistent with the district plan provisions.



scenario that would eventuate under the currently proposed District Plan provisions, which has some capacity for additional housing development. Under this scenario only 14% of dwellings would be priced at \$600,000 or less.

The third is the Existing Stock plus Commercially Feasible Capacity plus Proposed Development scenario. This is the scenario that would occur if the proposed zoning is applied to the subject properties. Under this scenario an increased 21% of dwellings would be priced at \$600,000 or less. Notably, the proportion of dwellings between \$200,000 - \$400,000 increases from 1% to 2%. This would have a wide range of social and economic benefits, most notably there would be more diversity in the housing stock, in terms of size and price, and this would enable more households to meet their housing needs.

Figure 15: Future Housing Scenarios for Prebbleton

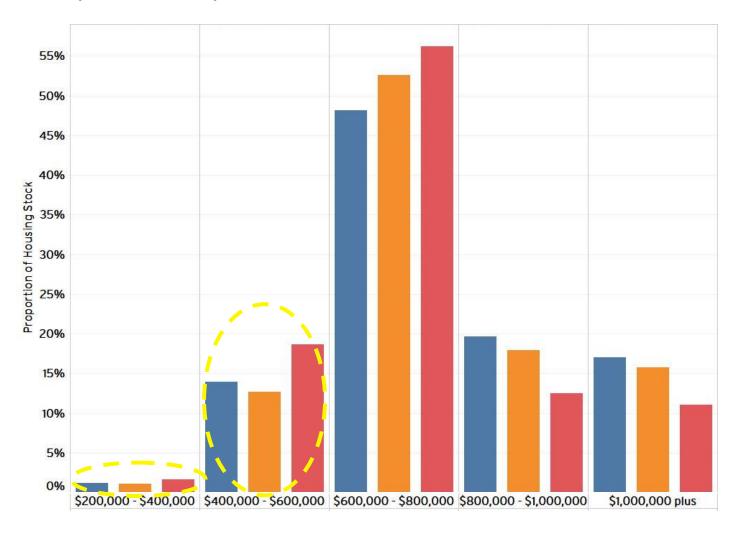
Future Scenario	Total Dwellings	Total Dwellings %	
Existing Stock			
\$200,000 - \$400,000	20	1%	
\$400,000 - \$600,000	240	14%	
\$600,000 - \$800,000	830	48%	
\$800,000 - \$1,000,000	339	20%	
\$1,000,000 plus	293	17%	
Total	1722	100%	
Existing Stock plus Commercially F	easible Capacity		
\$200,000 - \$400,000	20	1%	
\$400,000 - \$600,000	240	13%	
\$600,000 - \$800,000	995	53%	
\$800,000 - \$1,000,000	339	18%	
\$1,000,000 plus	299	16%	
Total	1893	100%	
Existing Stock plus Commercially Feasible Capacity plus Proposed Development			
\$200,000 - \$400,000	45	2%	
\$400,000 - \$600,000	505	19%	
\$600,000 - \$800,000	1525	56%	
\$800,000 - \$1,000,000	339	12%	
\$1,000,000 plus	299	11%	
Total	2713	100%	

Source: Corelogic, Urban Economics



Figure 15 provides a graphical representation of the three scenarios. It is worth noting the increase in housing priced between \$400,000 and \$600,000 under the proposal and the increase in the housing stock between \$200,000 and \$400,000, as highlighted with the yellow circles. Only the proposal enables housing in these price brackets.

Figure 16: Future Housing Scenarios for Prebbleton



Existing Stock

Existing Stock plus Commercially Feasible Capacity

Existing Stock plus Commercially Feasible Capacity plus Proposed Development



12. NPS-UD Provisions

The key provisions of the NPS-UD that relate to efficient land markets is as follows:

NPS-UD:

"Policy 1: Planning decisions contribute to well-functioning urban environments, which are urban environments that, as a minimum: have or enable a variety of homes that:

(i) meet the needs, in terms of type, price, and location, of different households..."

"Policy 2: Tier 1, 2, and 3 local authorities, at all times, [must] provide at least sufficient development capacity to meet expected demand for housing and for business land over the short term [1 to 3 years], medium term [3 to 10 years], and long term. [11 to 30 years]"

"Policy 8: Local authority decisions affecting urban environments are responsive to plan changes that would add significantly to development capacity and contribute to well functioning urban environments"

The following figure compares the estimated capacity for housing with the estimated demand for housing across the short, medium and long term. The key points to note are:

- There is currently 'reasonably expected' development capacity for an additional 126 dwellings. With demand averaging 112 dwellings per annum, this is only one year of supply.
- Currently the NPS-UD requirements for the short, medium and long term are not met for Prebbleton.
- The Proposed Development will bring capacity for an additional 820 dwellings to the market. This would increase capacity to 8.4 years, which would enable the short-term and medium-term capacity requirements to be met. Under the higher demand scenario, of 140-180 dwellings per annum, this would represent 5-6 years capacity.
- It is the responsibility of the Regional Council to define 'significant development capacity' as at the date of this report's publication, Environment Canterbury has not yet done this.
- In our view the proposal represents considerable significant development capacity. If an area is unable to meet the requirements of policy 1 then developments that enable this policy to be met should be considered significant. The proposal would result in the provision of considerable affordable housing in the \$400,000 \$600,000 and the \$200,000 to \$400,000 price brackets, which is currently undersupplied.



Figure 17: NPS-UD and AUP Development Capacity Analysis

	Existing Capacity	Existing Capacity Plus Prebbleton West Block
Dwelling Infill 'Reasonably Expected' for Development	9	9
Capacity Greenfield 'Reasonably Expected' for Development	117	937
Demand per annum	112	112
Years Supply	1.1	8.4
Short (0-3 year)	Not Met	Met
NPS-UD Land Provision Requirements Medium (3-10 year)	Not Met	Not Met
Long (10-30 year)	Not Met	Not Met

Source: Urban Economics, Operative Selwyn District Plan

13. Infrastructure Considerations

The current *Selwyn Long Term Plan* estimates the infrastructure expenditure required to meet the demands of growth at \$466.3m over the 2018 - 2048 period. Over this same time period, the Selwyn district is expected to experience population growth of 20,850 households. This equates to infrastructure expenditure of \$22,400 per household. The site is well serviced with existing infrastructure and is estimated to provide capacity for 820 households. Utilising existing infrastructure capacity reduces the infrastructure expenditure per household required to accommodate growth. This is an economic benefit.

14. Conclusion

Currently there is very little commercially feasible capacity for new dwellings in Prebbleton, either from subdividing existing residential properties or from live zoned new greenfield development areas. The proposal would meet this short-term shortage and enable Prebbleton to meet it's NPS-UD requirements across the short and medium term requirements to provide sufficient capacity to meet demand for housing.

The proposal takes advantage of existing infrastructure. This reduces the infrastructure cost per additional household. This is an economic benefit.

The proposal also enables more affordable housing in the \$200,000 - \$600,000 price range by providing relatively small lots at between 200 - 500m². Currently only 240 dwellings or 14% of all dwellings fall within this price range. The proposal enables an additional 820 dwellings bringing the proportion of total housing stock within this range up to 21%. Enabling a diversity of housing choices both in terms of size and price is a significant economic benefit for Prebbleton.

The proposal has several economic benefits and no economic costs and is therefore recommended for approval.



15. Appendix 1: Housing Capacity Assessment Methodology

The following methodology has been used to determine the feasible and likely to be realized capacity for additional housing in this report:

- 1) The land area, capital value, improvement value, land value, most recent sale price (if applicable), most recent sale date (if applicable) and zone of all residential properties in Prebbleton was downloaded from CoreLogic and the Operative Selwyn District plan.
- 2) Feasible lot sales prices for different sized lots were determined from a regression of Council valuations of land values on land area.
- 3) The feasibility of development for each property was tested by taking the Council valuation of each property and the development costs associated with supplying additional lots to the market as costs and the price per lot achievable as determined in step 2 as revenue. If revenue exceeds costs, then development is determined to be feasible.
- 4) Feasible capacity has been adjusted for likely realized capacity.



16. Appendix 2: Lot Size and Lot Value Correlation

The following figures shows the estimated lot price for a range of lot sizes in Prebbleton based on sales in Prebbleton over the last year (June 2020-June 2021). This is derived from a regression analysis, which had a r^2 of 35%, indicating a moderate correlation. Land area was significant at the 99% confidence level in determining land value. This provides a strong indicator of the value of land within the Prebbleton market at different lot sizes.

Figure 18: Lot Size and Lot Price Correlation for Prebbleton

Lot Size (sqm)	Lot Price
200	\$165,000
300	\$216,000
400	\$252,000
500	\$280,000
600	\$303,000
700	\$322,000
800	\$339,000
900	\$353,000
1,000	\$366,000
1,100	\$378,000
1,200	\$389,000
1,300	\$399,000
1,400	\$408,000
1,500	\$417,000
1,750	\$436,000
2,000	\$453,000
3,000	\$504,000
5,000	\$567,000
10,000	\$654,000



Source: Corelogic, Urban Economics



ATTACHMENT C Abley Note - Plan Change Response to Council Transport Comments



Plan Change 68 Response to Council Transport Comments

Prepared for: Andrew Mazey, Selwyn District Council

Job Number: UEL-J001

Revision: A

Issue Date: 31 May 2021

Prepared by: Dave Smith, Technical Director

Reviewed by: Jo Draper, Associate

Introduction

This technical note documents the response to transport comments relating to Plan Change 68, received from Selwyn District Council on 28th April 2021.

The comments from Council are included in italics with Abley response following each point.

Council feedback and response

1. Table 2.1 Traffic Counts. Some ADT outdated/just plain wrong. The worst one is Springs Rd which is actually 8,193 max (not 2,660), followed by Shands Rd at 14,679 (not 12,886), Trents Rd 2671 max (not 1,652), Hamptons Rd 2682 (not 2240). Not sure how influential these traffic counts were in the subsequent analysis, maybe used as an indicator here - as I am sure Abley must have used the best information sources available for the more detailed assessment. But...?

We agree with these figures. The traffic volumes were sourced from Council's September 2019 traffic count spreadsheet and the updated figures noted in Council's feedback correspond to the latest April 2021 spreadsheet available online. The 2,660 is a lookup error and acknowledged to be incorrect. It is however noted that the latest Hamptons Road count is 2,169 (October 2020). These values do not affect the assessment of effects in the ITA as the intersection analysis was based on manual counts collected in October 2020. The ITA has been updated.

- 2. There are some inconsistencies in Section 3.1 and assumptions that the Applicant has made on planned roading upgrades in the area. This may relate to the current 2018-28 LTP they have referred to compared to the recently approved Draft 2021-31 LTP. To confirm expected Council projects and timing
 - 1. Shands/Trents Road roundabout 2022/23 plus seal widening of Trents Rd east to near Lindsay Dr
 - 2. Shands/Hamptons roundabout 2023/24 plus seal widening of Hamptons Rd between Shands and Springs Rd.
 - 3. Springs/Hamptons roundabout* 2024/25
 - 4. Springs/Trents intersection* upgrade or roundabout. Not in any Council forward upgrade programmes.
 - 5. Templeton to Prebbleton Cycleway (along Trents Rd) 2023/24. If this is on or off road in the vicinity of this PC has yet to be determined by Council





Thank you for confirming the updates from the draft LTP. The inclusion of Springs/Hamptons roundabout is noted and confirms that three of the four intersections around the perimeter of the proposed Plan Change site are intended to be updated in the next 3-4 years. The ITA has been updated to reflect the 2021-31 LTP.

3. Following on from this it is stated the modelling has assumed the last two intersections (*) are not included in any analysis, which seems to be contrary to the intersection SIDRA analysis carried out and future scenarios. For example these analyses includes both a priority and roundabout at both Springs/Trents and Springs/Hamptons and/or are double ups? Equally references to the Prebbleton Structure Plan also seem contradictory on this. It seems confusing - however overall conclusions are still likely correct as to traffic effects but needs to be better aligned and represented in the analysis with the corresponding conclusions.

Based on the 2018-28 LTP there was uncertainty as to whether the two Springs Road intersections would be upgraded by 2030 which was the assessment year for the intersection analysis in the ITA. As such we decided to model these two intersections both in their current forms and as roundabouts to demonstrate that the additional traffic due to PC68 could be accommodated regardless of what form of intersection is on the network along Springs Road. In the context of the draft 2021-31 LTP we have updated the ITA to include only roundabout modelling at Springs/Hamptons and priority control modelling at Springs/Trents intersection.

4. I am not sure what the reference to upgrades at "Rolleston/Rolleston Industrial Zone 2023/24" in Section 3.1 have to do with anything for this PC. The most recent information by the NZTA on SH1 through Rolleston can be found here.

 $\underline{\textit{https://www.selwyn.govt.nz/news-And-events/news/archived/rolleston-transport-improvements-project-community-update-2020}$

The rationale for this reference is a minor point in that the SH1 upgrades in Rolleston will make the Industrial Zone more accessible from Prebbleton residents who may work in Rolleston Industrial Zone.

5. The reference to "Roading Collector" and "Major Intermediate" on the ODP is confusing in context to aligning to District Plan Hierarchy which is the same but different, but attempted to be explained in Section 4.1 by the Applicant. This would be solved by usual practice of the ODP showing "primary" and "secondary" roads which then allows more flexibility to select the right road classification at the time of subdivision. For example a Primary road could be a Collector or Local Major and Secondary Local intermediate in line with Council classifications. I am not 100% convinced on the overall layout of their "major intermediate" roads to terms of supporting PC block development – is there a more detailed indicative subdivision plan that justified the roading layout?

We are happy for the ODP roading to be reclassified as primary and secondary roads to enable more flexibility going forwards. The ODP has been updated accordingly, is included in the ITA and we are happy to continue to liaise with Council in this regard.

6. A walk/cycle link is also available from both the end of Pesco Place and Sterling Drive/Reserves. These should be shown on the ODP. I note for both these and the proposed roading connection from Guinea Pl, these will need to be formed by the Applicant to extend these from where they current end within the adjoining Sterling Park subdivision.

We agree that if these opportunities to improve connectivity to the existing residential areas to the southeast of the PC68 site are available then they should be included within the ODP. The ODP has been updated accordingly and included in the ITA.

7. Have to be careful that the likes of the "Roading Collectors" in particular the one closest to Shands Road doesn't not become a defacto short cut or rat run that bypasses the Shands/Hamptons/Springs Rd arterial road and intersection upgrade route being established by Council for wider network arterial traffic e.g. to and from Lincoln. Design elements could discourage this and hence why I do not want to be listed as a collector as this has certain implications as to Levels of Service that may not assist in dealing with this concern.

The speed environment within the Plan Change area is intended to be equal to or lower than that on the wider arterial network which will reduce the attractiveness of this collector for rat-running traffic. The collectors are also not direct





connections due to their slightly circuitous alignment in the ODP which further reduces their attractiveness. Our assessment of Shands Road intersections in Tables 7.9 and 7.10 of the ITA demonstrates that these will operate at LoS A/B with minimal delays so the likelihood of rat-running to avoid the Shands Road intersections is low. Regardless, traffic calming could be considered if there was rat-running occurring in the long term.

8. Also the proximity of the "major intermediate" intersections onto Hamptons and Trents Rd close to the respective Shands Rd intersections (and roundabout upgrades planned) needs to be watched.

Agreed. The intersections on both corridors in the current ODP have a similar offset to Farthing Drive and Springs Road at the southern end of Hamptons Road. The future speed environment will be key here to ensure based on the vehicle operating speeds that there is sufficient sight distance between these intersections and the Shands Road roundabouts. We propose that the speed limit along both corridors should be reviewed and reduced in line with the change in activity along the corridors should PC68 be approved.

9. As usually mentioned it will be a requirement at the time of subdivision to upgrade the Hamptons and Trents Road frontages to an urban standard i.e. widening, footpaths, drainage, lighting etc. No access to Shands Rd I presume as the PC doesn't extend that far. Usually denoted on the ODP as such (like previous PC/developments north along Shands Rd with frontage)

Agree this would be expected.

10. The bulk of the PC area is away from current Bus/PT services which is not very helpful if services in the future cannot be directed by ECan to service this area

As this area develops there will be more potential to provide public transport services in the vicinity due to the increased catchment. We are happy to liaise with ECan regarding the potential for future services closer to and/or through the PC68 site.

11. Otherwise as advised before no major fatal flaws with this PC from my perspective. The saving grace is that the existing adjoining main roads and intersections effected already planned for capacity and/or safety upgrade by the Council and the NZTA (with the exception of Springs/Trents)

Excellent. Thank you.

This document has been produced for the sole use of our client. Any use of this document by a third party is without liability and you should seek independent traffic and transportation advice. © Abley Limited 2021 No part of this document may be copied without the written consent of either our client or Abley Ltd. Please refer to https://www.abley.com/output-terms-and-conditions-1-1/ for our output terms and conditions.



ATTACHMENT D Abley – Revised Integrated Traffic Assessment – 31 May 2021



Prebbleton Private Plan Change Integrated Transportation Assessment

Urban Estates Limited





Prebbleton Private Plan Change Integrated Transportation Assessment

Urban Estates Limited

Quality Assurance Information

Prepared for: Urban Estates Limited

Job Number: UEL-J001

Prepared by: Ruby Kim, Senior Transportation Engineer

Shendi Mani, Transportation Engineer

Reviewed by: Dave Smith, Technical Director

Date issued	Status	Approved by
30 October 2020	Draft	Dave Smith
31 May 2021	Draft v1	Dave Smith

This document has been produced for the sole use of our client. Any use of this document by a third party is without liability and you should seek independent advice. © Abley Limited 2019. No part of this document may be copied without the written consent of either our client or Abley Limited. Refer to http://www.abley.com/output-terms-and-conditions-1-0/ for output terms and conditions.



Contents

1.	Introduction	1
1.1	Background	1
2.	Existing Land Use and Transport Environment	2
2.1	Locality	2
2.2	Zoning	2
2.3	Existing Land Use	3
2.4	Surrounding Roads	3
2.5	Surrounding Intersections	6
2.6	Existing Traffic Volumes	10
2.7	Safety	12
2.8	Walking Facilities	14
2.9	Cycling Facilities	16
2.10	Public Transport	17
3.	Future Receiving Environment	21
3.1	Future Infrastructure	21
4.	Proposed Plan Change	23
4.1	SDC Road Hierarchy	25
5.	Accessibility	26
6.	Travel Characteristics and Trip Generation	30
6.1	Trip Generation	30
6.2	Trip Distribution	30
6.3	Parking Supply and Demand	31
7.2	Traffic Surveys	32
7.3	Capacity Assessment	32
8.	Strategic Planning Framework	41
8.1	Local Policy Environment	42
9.	Conclusion	45

ii



Tables

Table 2.1 Traffic counts	11
Table 2.2 Crash data (2015-2019)	12
Table 5.1 Travel times to/from popular travel destinations from Prebbleton	26
Table 6.1 Trip Rate Comparison	30
Table 7.1 Capacity Assessment	32
Table 7.2 Level of Service (LOS) General Descriptions	33
Table 7.3 SIDRA Results - Base Scenario (2020) AM Peak	34
Table 7.4 SIDRA Results - Base Scenario (2020) PM Peak	35
Table 7.5 SIDRA Results - Future Base Scenario (2030) AM Peak	35
Table 7.6 SIDRA Results - Future Base Scenario (2030) PM Peak	36
Table 7.7 SIDRA Results - Future Development Scenario (2030) AM Peak	37
Table 7.8 SIDRA Results - Future Development Scenario (2030) PM Peak	37
Table 7.9 Shands Road / Trents Road Intersection Performance Comparison	38
Table 7.10 Shands Road / Hamptons Road Intersection Performance Comparison	38
Table 7.11 Springs Road / Hamptons Road Intersection Performance Comparison	39
Table 7.12 Springs Road / Trents Road Intersection Performance Comparison	39
Table 8.1 SDC District Plan Objectives and Policies	42



Figures

Figure 2.1 The site (sourced: Canterbury Maps 2019)	2
Figure 2.2 Selwyn District Zoning Map	3
Figure 2.3 Shands Road looking south (site left of the image)	4
Figure 2.4 Trents Road looking east (site on right of image)	
Figure 2.5 Hamptons Road looking east (site on left of image)	5 6 7
Figure 2.6 Nearby intersections	7
Figure 2.7 Intersection of Hamptons and Springs Road (looking north-east towards	
Hamptons Road)	8
Figure 2.8 Intersection of Trents Road and Springs Road (Looking south-west down Spr Road).	ings 8
Figure 2.9 Intersection of Shands and Trents Road (looking north-west towards Trents	
Road).	9
Figure 2.10 Intersection of Shands and Hamptons Road (looking south-east)	10
Figure 2.11 Hamptons Road existing vehicle activated warning stop sign	10
Figure 2.12 CSM2 project over view (Sourced from NZTA)	11
Figure 2.13 Collective Risk for the surrounding road network around the site.	13
Figure 2.14 Personal Risk for the surrounding road network around the site.	14
Figure 2.15 Springs Road facing south.	15
Figure 2.16 Nearby new development area	16
Figure 2.17 Prebbleton cycle network	17
Figure 2.18 Bus route 80 between Lincoln and Parklands.	18
Figure 2.19 Bus route 80 in relation to the site.	19
Figure 2.20 Express bus route 80 from Lincoln to Ara Institute (via Prebbleton)	20
Figure 4.1 Outline Development Plan (ODP)	24
Figure 5.1 Prebbleton departure destinations (shown in red) – source Stats NZ.	27
Figure 5.2 Future cycle network including existing routes. (source SDC walking and cyc strategy -2018)	28
Figure 5.3 Prebbleton future walking and cycling route (source: Prebbleton Structure Pla	•
	29
Figure 8.1 Proposed Changes to the Christchurch Bus Network	42

Appendices

Appendix A CCC ITA Guidelines – Accessibility Maps

Appendix B Survey Results and Trip Distribution

Appendix C SIDRA Movement Summary

Appendix D CAS Collision Diagrams

1



1. Introduction

Urban Estates Limited (Urban Estates) are lodging a Private Plan Change application to establish residential zoning in an area bound by Shands Road, Trents Road, the existing urban area adjacent to Springs Road and Hamptons Road, to the west of the Prebbleton Town Centre. A Private Plan Change is required as this land is currently zoned as Inner Plains. The proposed zoning is Living Z with some areas indicated as medium and low density, with several public spaces/reserves.

Urban Estates commissioned Abley Limited (Abley) to prepare an Integrated Transport Assessment (ITA) to accompany the Plan Change. The purpose of this ITA is to evaluate the potential transportation related effects of the Plan Change on the future receiving environment. The ITA has been prepared using the guidance specified in the Waka Kotahi NZ Transport Agency Research Report 422 published in 2010. The guidelines identify four levels of scope for an ITA, named "Basic assessment", "Neighbourhood transport impact assessment", "Local area transport impact assessment" and "Wide area transport assessment." Given the scale, location and anticipated trip generation of the Plan Change a "Wide area transport assessment" has been prepared to prepare a robust and comprehensive assessment of traffic and transportation effects.

1.1 Background

The site is located approximately 2km from Prebbleton Town Centre with a total area of 77 hectares. A total of 820 residential lots are proposed in the Plan Change area. The existing zoning is labelled is zoned as Inner Plains (IP) in the Selwyn District Plan. The existing land use is primarily farmland.

There are four nearby intersections that border the site and provide access to the wider transport network, those being as follows:

- Intersection of Hamptons and Springs Road
- · Intersection of Trents and Springs Road
- Intersection of Shands and Trents Road
- · Intersection of Hamptons and Shands Road

The site has frontages on Hamptons, Trents and Shands Roads however no accessways are proposed along Shands Road. The Christchurch Southern Motorway Stage 2 (CSM2) has opened on September 2020. The CSM2 provides better access to and from the south of Christchurch, the city centre and Lyttleton by improving capacity, safety and alignment of the Christchurch Southern Corridor. There is an interchange directly off Shands Road onto CSM2, providing connectivity between Prebbleton and Christchurch, Rolleston and further afield.



2. Existing Land Use and Transport Environment

2.1 Locality

The site is located approximately 2km south-west from Prebbleton town centre and approximately 15km south-west from Christchurch CBD. The site is located west of an existing residential area with three surrounding roads forming the boundary of the site. The location of the site in context of the wider area is shown in Figure 2.1.

The surrounding land use is primarily residential and rural zoning surrounding the site.

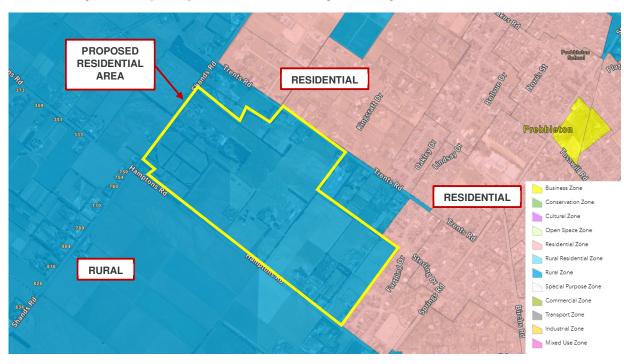


Figure 2.1 The site (sourced: Canterbury Maps 2019)

2.2 Zoning

The site is currently zoned as a Rural – Inner Plains Zone (IP). As shown in **Figure 2.2**, the area immediately to the east is categorised as Living Z (LZ). To the north the areas are categorised as Living 3 (L3), LZ, Living X (LX) and Existing development Area (EDA – Kingcraft Drive). These areas are all different varieties of residential zoning that will vary in density and characteristics. The area south and west of the site is zoned as Rural – Inner Plans (IP).



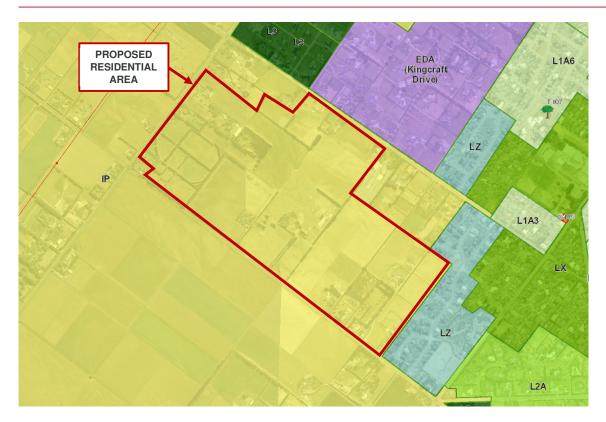


Figure 2.2 Selwyn District Zoning Map

2.3 Existing Land Use

The site is currently occupied by rural activities, predominantly farmland.

2.4 Surrounding Roads

The site has frontage on to Hamptons Road along the southern boundary, Shands Road along the western boundary and Trents Road along the northern boundary. All surrounding intersections surrounding the site operate as stop intersections.

Shands Road

Shands Road runs in a north/east – south/west orientation between the suburbs of Springston and Hornby, approximately 15km in length total. Hornby is approximately 5km north of the site and Springston is approximately 8km south of the site. To the north Shands Road provides access to CSM2 that runs along the southern boundary of Christchurch CBD. The segment of Shands Road between Trents Road and Hamptons Road, to which the site abuts, is a two-lane carriageway with one traffic lane in each direction. Shands Road is consistent throughout the section between Trents Road and Hamptons Road, providing a shoulder roughly 1.5m in width on both sides of the road and a painted centreline. The overall road reserve width is 20m. There are no footpaths or cycle facilities on either side of the carriageway.

The District Plan classifies Shands Road as an Arterial road. The posted speed limit along Shands Road ranges from 100km/h to 50km/h, with an 80km/h speed limit within the vicinity of the site. It is considered that it would be appropriate to review this speed limit should the plan change be approved.

Within the One Network Road Classification system (ONRC), Shands Road is classified as an Arterial road. A general view of Shands Road along the frontage of the site is shown in **Figure 2.3**.





Figure 2.3 Shands Road looking south (site left of the image)

Trents Road

Trents Road runs north/west – south/east orientation between the towns of Templeton and Prebbleton, approximately 5km in length. Templeton is located approximately 3km from the site and Prebbleton is located approximately 1-2km from the site. To the north/west Trents Road provides access onto SH1 that runs along the northern boundary of Christchurch. The segment of Trents Road between Shands Road and Springs Road, adjacent to the site, is a two-lane carriageway with one traffic lane in each direction. Between Shands Road and Oakley Drive (which is the end of the existing residential area), Trents Road provides no shoulder, footpaths or cycle facilities with a painted centreline. From Oakley Drive to Springs Road that is an existing residential area, Trents Road provides on-street parking and footpaths on both sides of the road, no cycling facilities are provided. The overall road reserve width is 20.4m throughout.

The District Plan does not classify this road in either the urban or rural plans. Within the ONRC, Trents Road is classified as a Secondary Collector. The posted speed limit along Trents Road ranges from 80km/h to 50km/h, with 70km/h speed limit within the vicinity of the site. It is considered that it would be appropriate to review this speed limit should the plan change be approved. A general view of Trents Road along the frontage of the site is shown in **Figure 2.4**.





Figure 2.4 Trents Road looking east (site on right of image)

Hamptons Road

Hamptons Road runs north/west north/west – south/east orientation between Waterholes Road to end of road approximately 5km in length. To the north/west Hamptons Road provides a connection to CSM2, approximately 3km from the site. The segment of Hamptons Road between Shands and Springs Road adjacent to the site, is a two-lane carriageway with one traffic lane in each direction. Hamptons Road provides no shoulder, footpath or cycle facilities with a painted centreline. The overall road reserve width is 20m throughout.

The District Plan classifies Hamptons Road an Arterial Road. The posted speed limit on Hamptons Road is 80km/h throughout. Within the ONRC, Hamptons Road is classified as a Primary Collector. It is considered that it would be appropriate to review this speed limit should the plan change be approved. A general view of Trents Road along the frontage of the site is shown in **Figure 2.5**.





Figure 2.5 Hamptons Road looking east (site on left of image)

2.5 Surrounding Intersections

The site has four main intersections that connect the site to the surrounding road network as follows:

- Intersection of Hamptons and Springs Road
- Intersection of Trents and Springs Road
- Intersection of Shands and Trents Road
- Intersection of Hamptons and Shands Road

A map of these intersections in relation to the site is shown in Figure 2.6.



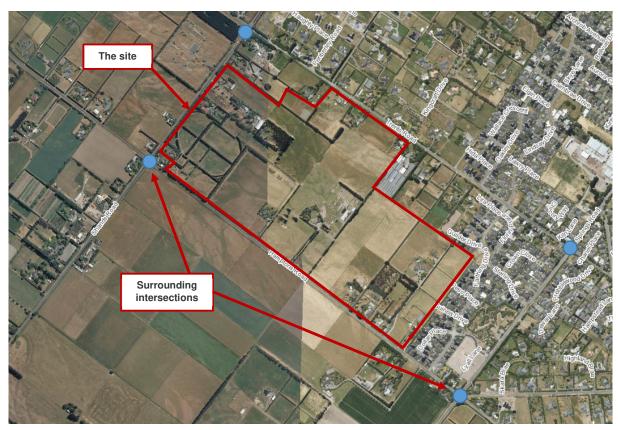


Figure 2.6 Nearby intersections

Intersection of Hamptons and Springs Road

The intersection of Hamptons and Springs Road located south-east of the site is a stop intersection with priority given to Springs Road. This intersection is shown in **Figure 2.7** looking north-east towards Hamptons Road. There are no pedestrian crossing facilities and no footpaths located on either side of the intersection. The lane widths are wide allowing for two vehicles to comfortably fit side by side at the head of the stop lane. There is clear visibility on both sides of the road for over 100m as the road is flat and straight on either side.

Vehicles travelling through Springs Road do not have enough space at this intersection to pass any vehicles that may be stopped to turn right onto to Hamptons Road.





Figure 2.7 Intersection of Hamptons and Springs Road (looking north-east towards Hamptons Road)

Intersection of Trents and Springs Road

The intersection of Trents and Springs Road located north-east of the site is a stop intersection with priority given to Springs Road. This intersection is shown in **Figure 2.8** looking south-west down Springs Road. There are no pedestrian crossing facilities provided. A footpath is provided on one side of the road. The lane widths are wide allowing for two vehicles to comfortably fit side by side at the head of the stop intersection. There is clear visibility on both sides of the road for over 100m as the road is flat and straight on either side. There is a right turn bay onto Trents Road from Springs Road allowing for vehicles travelling south on Springs Road to pass.



Figure 2.8 Intersection of Trents Road and Springs Road (Looking south-west down Springs Road).



Intersection of Shands and Trents Road

The intersection of Trents and Shands Road located north-west of the site is a stop intersection with priority given to Shands Road. This intersection is shown in **Figure 2.9** looking north-west towards Trents Road. There are no pedestrian crossing facilities or footpaths provided. The lane widths are wide allowing for two vehicles to comfortably fit side by side at the head of the stop intersection. There is clear visibility on both sides of the road for over 100m as the road is flat and straight on either side similar to the previous intersections.

Vehicles travelling through Shands Road do not have enough space at this intersection to pass any vehicles that may be stopped to turn right onto to Trents Road.



Figure 2.9 Intersection of Shands and Trents Road (looking north-west towards Trents Road).

Intersection of Hamptons and Shands Road

The intersection of Hamptons and Shands Road located south-west of the site is a stop intersection with priority given to Shands Road. This intersection is shown in Figure 2.10 looking south-east towards Hamptons Road. There are no pedestrian crossing facilities or footpaths provided. The lane widths are wide allowing for two vehicles to comfortably fit side by side at the head of the stop intersection. There is clear visibility on both sides similar to the previous intersections. Vehicles travelling through Shands Road do not have enough space at this intersection to pass any vehicles that may be stopped to turn right onto to Hamptons Road.



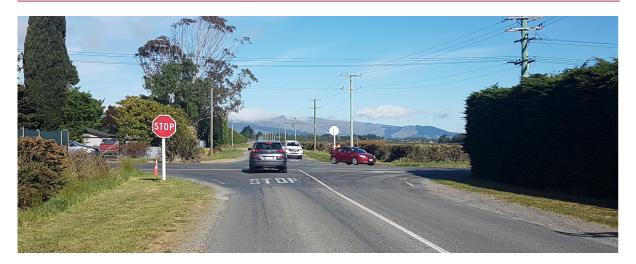


Figure 2.10 Intersection of Shands and Hamptons Road (looking south-east)

A vehicle activated advance warning stop sign is located north -west on Hamptons Road approximately 100m from the intersection of Shands and Hamptons. This is shown on **Figure 2.11**.



Figure 2.11 Hamptons Road existing vehicle activated warning stop sign

2.6 Existing Traffic Volumes

Selwyn District Council undertakes traffic counts of roads on its network, typically at three yearly intervals. The most recent Annual Average Daily Traffic (AADT) follows for the streets in the immediate vicinity of the site are summarised in **Table 2.1**. It is noted that since these counts were recorded the Christchurch Southern Motorway Stage 2 (CSM2) project has opened and would have been under construction during this period. This is a significant project which is likely to impact on flows on some of these key corridors. For these reason full intersection counts have been captured on Shands Road and Springs Road in October 2020 and these are presented later in this report.



Table 2.1 Traffic counts

Street	Location	Data Source	AADT	HGV (%)	Year
Shands Road	Between Trents and Hamptons Road	Selwyn District Council	14,679	10%	2020
Trents Road	Between Shands Road and Springs Road	Selwyn District Council	2,671	8%	2019
Hamptons Road	Between Shands and Springs Road	Selwyn District Council	2,169	11%	2020
Springs Road	Between Trents Road and Hamptons Road	Selwyn District Council	8,193	6%	2019

Christchurch Southern Motorway Stage 2 (CSM2)

The final section of CSM2 has opened on September 2020. The CSM2 provides better access to and from the south of Christchurch, the city centre and Lyttleton by improving capacity, safety and alignment of the Christchurch Southern Corridor. CSM2 provides a four-lane divided carriageway between from Halswell Junction Road to SH1 near Robinsons Road an alternative to SH1. Shands Road has direct access to the city through the Shands Road interchange that connects to CSM2. Similarly, vehicles travelling north on Springs Road will be able to connect onto CSM2 through the Halswell Junction interchange. The project overview map is shown on Figure 2.12.

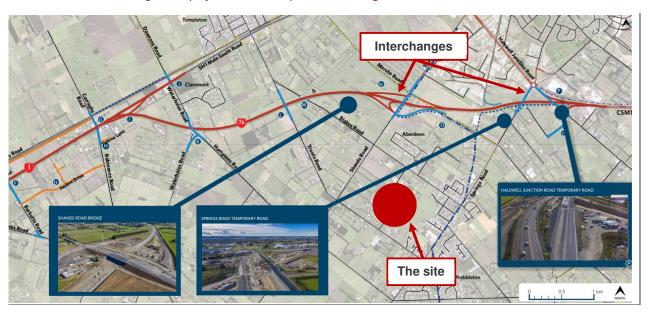


Figure 2.12 CSM2 project over view (Sourced from NZTA)



2.7 Safety

Crash History

A search of the NZ Transport Agency Crash Analysis System (CAS) database for the period of 2015 to 2019 (inclusive), identified 26 crashes in the vicinity of the site. The crashes are shown in the CAS crash diagram in Appendix D with totals summarised in **Table 2.2**. The search area included:

- Intersection of Hamptons Road and Springs Road (crashes within 50m)
- Intersection of Trents Road and Springs Road (crashes within 50m)
- Intersection of Shands Road and Trents Road (crashes within 50m)
- Intersection of Hamptons Road and Shands Road (crashes within 50m)
- Hamptons Road between Springs Road and Shands Road (excluding the intersections mentioned)
- Springs Road between Hamptons Road and Trents Road (excluding the intersections mentioned)
- Trents Road between Springs Road and Shands Road (excluding the intersections mentioned)
- Shands Road between Trents Road and Hamptons Road (excluding the intersections mentioned)

Table 2.2 Crash data (2015-2019)

Location	Fatal	Serious	Minor	Injury Total	Non-Injury	Total
Intersection of Hamptons Road and Springs Road.	0	0	2	2	2	4
Intersection of Trents Road and Springs Road	0	0	0	0	0	0
Intersection of Shands Road and Trents Road	0	0	4	4	4	8
Intersection of Hamptons Road and Shands Road	0	2	1	3	6	9
Hamptons Road between Springs Road and Shands Road	0	0	0	0	0	0
Springs Road between Hamptons Road and Trents Road	0	0	0	0	2	2
Trents Road between Springs Road and Shands Road	0	0	0	0	1	1
Shands Road between Trents Road and Hamptons Road	0	0	0	0	2	2

The crash history shows that crashes are concentrated at the intersection of Shands and Hamptons Road and the intersection of Shands and Trents Road. This is due to the higher volumes of traffic travelling along Shands Road. The two reported serious crashes were due to vehicles failing to stop on Hamptons Road towards Rolleston. The existing Hamptons Road vehicle activated warning stop sign is for vehicles travelling towards Prebbleton on Hamptons Road. A similar sign for vehicles travelling towards Rolleston would further mitigate any safety issues at this intersection, however



it is noted that Council have plans to install a large rural roundabout at this location in the next four years. The corridors between the four intersections had only five non-injury crashes. Overall, the number of crashes on the surrounding road network are low and do not indicate a strong underlying safety issue.

Risk Maps

The Waka Kotahi Safer Journeys Risk Assessment Tool as part of the Speed Management Framework 2020 is used to analyse the road safety of road corridors. The two types of risk metrics are summarised as follows:

- Collective Risk is a measure of the total estimated death and serious injury (DSi) casualty equivalents for a site. It is
 effectively a measure of the number of deaths and serious injuries that can be expected at a site over the next
 analysis period (typically five years). At a corridor level, Collective Risk is the total estimated DSi casualty
 equivalents derived from the intersection and midblock components divided by the length of the corridor. It is
 expressed as estimated DSi / km. This is shown in Figure 2.13.
- Personal Risk is a measure of the risk of an individual dying or being seriously injured at a site. It is calculated by dividing Collective Risk by a measure of traffic volume exposure. This is shown in Figure 2.14.

The risk rating will identify if there are any underlying safety issues along any of the corridors. These risk assessments are based upon crash data from 2015-2019.



Figure 2.13 Collective Risk for the surrounding road network around the site.



The collective risk maps shows that Hamptons Road and Trents Road have a low collective risk with Shands Road having a low – medium collective risk along the frontage of the site.



Figure 2.14 Personal Risk for the surrounding road network around the site.

The personal risk is low for Hamptons Road and Trents Road, while Shands Road has a low-medium personal risk rating along the frontage of the site.

Overall, there is no indication of any underlying safety issues with the surrounding roads along the frontage of the site.

High Risk Intersections

Waka Kotahi's Mega Maps is a risk assessment tool which displays the location of the top 200 high-risk intersections based on Collective Risk using the estimated DSi casualty equivalents risk assessment process as used in the High-Risk Intersections Guide. There are no high-risk intersections near the site, with the nearest being 1.5km north of the site at the intersection of Shands and Blakes Road. The Shands and Blakes Road (and nearby Springs and Marshes) intersection is at the time of writing out to tender for the design and construction of a large rural roundabout which will address these safety concerns.

2.8 Walking Facilities

The site is not well connected to the local pedestrian network as it is predominantly rural. Along the frontage of the site there are no footpaths on either side of the road available. There are no pedestrian crossing facilities available.



Photos of Springs Road indicate that it is a typical rural road that has been converted into an urban arterial overtime. Footpaths have been provided on one side of the road as shown in **Figure 2.15** providing walking facilities for the residential area.

Photos of the new residential development near the site were taken during our site visit on the 22^{nd} of October. This can be used as an indication of what the future proposed urban development may look like at the plan change site as a minimum. Footpaths have been provided on one side of the road, with courtesy crossings located at intersections. This is shown in **Figure 2.16**. However, it is recommended that footpaths on both sides of the road corridors within the site should include footpaths on both sides of the road to provide a walkable and pleasant environment .



Figure 2.15 Springs Road facing south.





Figure 2.16 Nearby new development area

2.9 Cycling Facilities

There is an existing shared path that runs along Springs Road that connects Prebbleton to the Christchurch cycle network as shown on **Figure 2.17**. There are no cycling facilities at the frontage of the site, with the nearest being the existing cycling facilities on Springs Road approximately 1km east of the site.



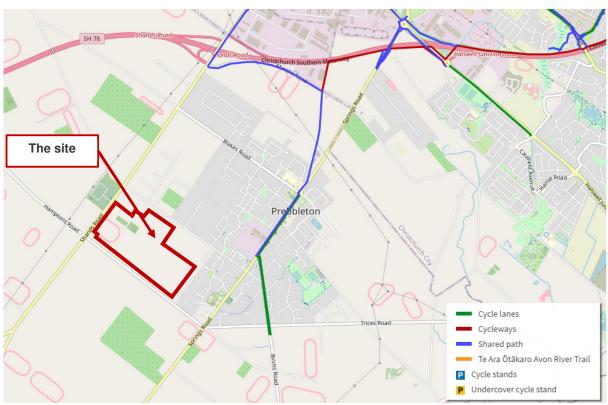


Figure 2.17 Prebbleton cycle network

2.10 Public Transport

The site does not have any bus stops located along its frontage. Currently there are several bus stops along Springs Road, that travel through Prebbleton township which are serviced by Bus Route 80 operating between Lincoln and Parklands. This bus route operates at high frequency intervals every 10-15mins during peak times and then every 30mins during non-peak hours on weekdays and on weekends. This bus route is shown in **Figure 2.18**. There is also an express bus route 80 that operates twice a day during peak times between Lincoln and Christchurch via Prebbleton. This route utilises the newly constructed CSM2 as shown on **Figure 2.20**. The express route between Prebbleton to Christchurch bus interchange reduces the time of travel from 35mins to 30mins.

The nearest bus stop to the site is approximately 1km from the nearest edge of the site as shown in Figure 2.19.



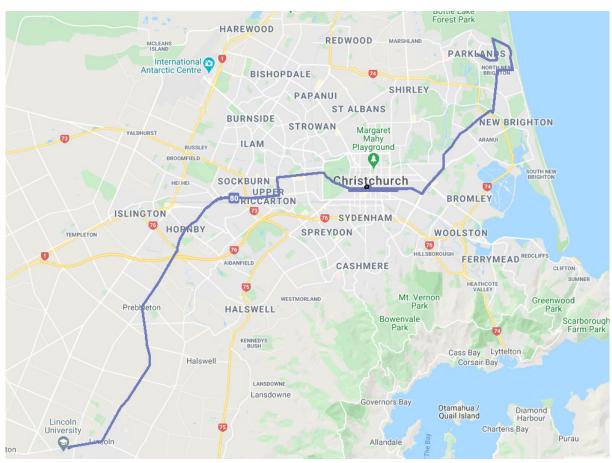


Figure 2.18 Bus route 80 between Lincoln and Parklands.



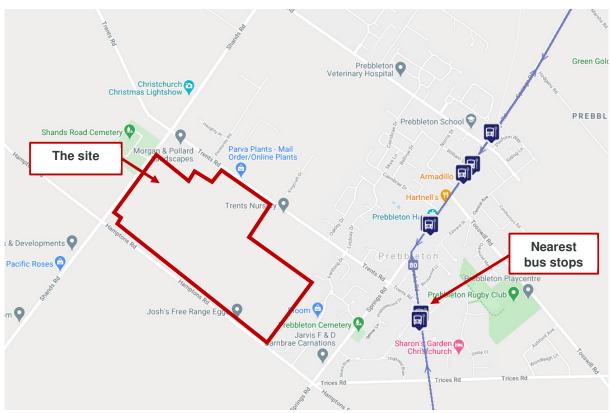


Figure 2.19 Bus route 80 in relation to the site.



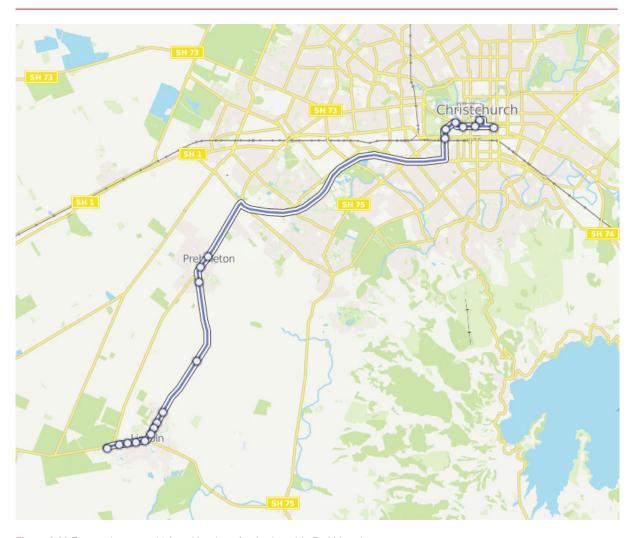


Figure 2.20 Express bus route 80 from Lincoln to Ara Institute (via Prebbleton)



3. Future Receiving Environment

3.1 Future Infrastructure

Selwyn District Council - draft Long Term Plan 2021-31

There are several roading upgrades planned in the vicinity of the site and included in the Selwyn District Council draft Long Term Plan 2021-31 (LTP). The LTP sets out the key projects and activities the Council is planning over the current 10 year period and how these will be funded. The following works are planned for 2021-31:

- Shands Rd / Trents Rd roundabout plus seal widening of Trents Rd east to near Lindsay Dr (2022/23)
- Shands Rd / Hamptons Rd roundabout plus seal widening of Hamptons Rd between Shands Rd and Springs Rd (2023/24)
- Springs Rd / Hamptons Rd roundabout (2024/25)
- Templeton to Prebbleton Cycleway along Trents Rd (2023/24)

With respect to funding SDC are planning to install large rural roundabouts at Shands/Trents and Shands/Hamptons in 2022-24 subject to Waka Kotahi NZ Transport Agency funding. At the time of preparing this ITA, SDC have out to tender detailed design and construction contracts for Marshs/Springs and Shands/Blakes dual lane rural roundabouts. The plans for these indicate dual lane roundabouts with inscribed (limit line to limit line) diameter in the order of 50-60 metres^[1]. For the purposes of this assessment it is assumed that similar sized roundabouts would be constructed at Shands/Trents and Shands/Hamptons intersections.

The urban roundabout noted in the LTP at Springs/Hamptons is more likely to be a single lane urban roundabout such as the Springs/Blakes roundabout which has single lane approaches and an inscribed diameter of 30 metres.

The Selwyn District Council LTP also highlights the following projects:

- Construct upgrades at key SH1 intersection in Rolleston/Rolleston industrial zone in 2023/24
- Prebbleton Arterial/CSM2 linkages construction intersections and road upgrades to provide linages to and around CSM2 in 2019/20- 2022/23
- Walking cycling will receive 11.5 million over the next 10 years to provide safe and convenient routes that will
 encourages active transportation

The Rolleston SH1 intersection upgrades are part of NZTAs package of projects in the Canterbury package. This upgrade will enable safer and better access from the residential area across SH1, the Main South Line (railway) to the industrial zone. As some residents in Prebbleton work and access Rolleston, this upgrade would better connect the two townships.

The Prebbleton Arterial/CSM2 linkage has already been constructed allowing for vehicles travelling north on from Prebbleton to access the Shands Road interchange of the Halswell Junction Interchange onto CSM2.

The Prebbleton Structure Plan 2010

The Prebbleton Structure Plan highlights the following projects:

- Roundabout is planned for the intersection of Springs Road and Hamptons Road.
- Cycling and pedestrian network proposed for the CSM1 and Halswell Junction Road.
- Blakes Road will become a collector road between Springs Road and Shands Road, to provide a connection to CSM2 Motorway.

As mentioned previously there is a roundabout planned for the intersection of Springs Road and Hamptons Road. This is expected to be similar to that at the current intersection of Springs and Blakes Road. This will be the southern





threshold to the village and will serve to slow down traffic entering the built-up area of the township from the south. It will also encourage through traffic to follow alternative route which by-pass Prebbleton, and travel along Shands Road to access the CSM2 interchange.

A cycle and pedestrian network proposed along CSM1 could provide an additional corridor for alternative modes of transport better connecting Prebble to Christchurch.



4. Proposed Plan Change

The proposed Plan Change site is approximately 77 hectares of land which is presently zoned Inner Plains rezoned to Living Z. The latest site Outline Development Plan (ODP) shown in **Figure 4.1** allow for 820 dwellings.

Figure 4.1 shows how the proposed Plan Change will connect to the road network. It is intended that properties will have direct access to the road network and via a right of way (ROW) for those lots without road frontage. The Plan Change area will gain access to the existing road network from via four access points on Trents Road, Guilder Drive extension, Guinea Drive extension and five access points on Hamptons Road. This is well integrated with the surrounding urban and rural areas.



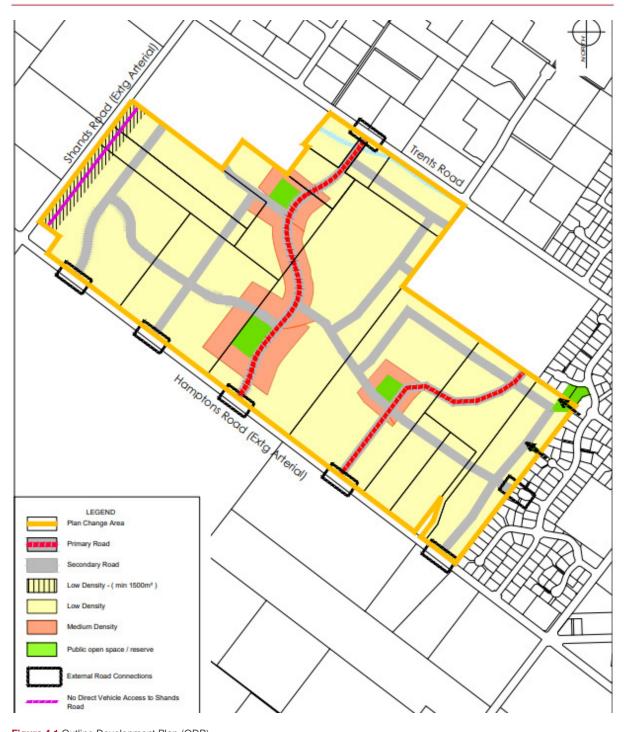


Figure 4.1 Outline Development Plan (ODP)



4.1 SDC Road Hierarchy

Selwyn District Council District Plan defines arterial, collector and local roads as following:

Arterial Road

- "They connect areas of district importance not already provided by State Highways. Arterial roads connect the districts townships and other important places and activities together, including across district boundaries. Arterial roads are subject to tighter access controls than collector and local roads to promote efficient traffic flow."

Collector Road:

"Their prime role is to distribute and collect local traffic within and between neighbourhood areas. In some situations they may link smaller rural communities to the arterial road network. Collector roads are required to balance the necessary traffic movement function against the property access function that they also need to provide."

Local

- "means a road that is not intended to act as a main through route for motorised vehicle traffic as their primary network function is to provide property access, and they generally have lower traffic volumes. Any road in the district that is not specifically identified in this Plan as a State Highway, Arterial or Collector road is a 'local road'. New Local roads are further classified into the following sub categories.
 - i) **Local Major Road:** means a local road that connects to collector and arterial roads (and other local roads). They are likely to form part of a wider network of connected roads of a similar standard that extends over an urban area. Council's urban design terminology refers to these roads as "local area Streets"
 - ii) Local Intermediate Road (includes cul de sacs): means a local road with low traffic volumes and speeds and primarily provides only for property access in urban areas, while maintaining some degree of connectivity best suited for walking and cycling between streets. The Councils urban design terminology refers to these as "neighbourhood streets",
 - iii) Local Minor (includes cul de sacs): means a local road that primarily provides for property access. Local minor roads are referred to as "resident's streets" Local minor roads are required to maximize street amenity in a space shared by all road users and have a low speed environment (less than 50km/hr)."

The red "Roading Collector" as mentioned in the ODC is similarly defined in the SDC district plan as a "Local Major Road" as it connects to the collector and arterial road; the collector road being Trents Road and the arterial being Hamptons Road. The proposed two local major roads will connect Trents and Hamptons Road running north-south between the two roads.

The existing cul-du-sacs will be extended with "Major Intermediate" roads as shown in the ODP. This is defined in the SDC district plan as a "Local Intermediate Road". These roads will likely reflect the existing development regarding pedestrian and carriageway streetscape to support low traffic volumes and speeds, and provide connectivity best suited for walking and cycling. These roads will also connect onto Hamptons and Trents Road. No accessways are proposed along Shands Road, which preserves its function as a through corridor between Lincoln/Rolleston and CSM2/Christchurch urban area.



5. Accessibility

Accessibility Metrics

The CCC Integrated Transport Assessment Guidelines (September 2015) provides a series of maps that can be used to describe the accessibility of a development site. The maps (included in Appendix A) include Prebbleton in the assessment. The maps show the site experiences high levels of accessibility by private vehicle however low to medium levels of accessibility by all other modes to employment and Key Activity Centres (KACs) in Christchurch as follows:

- Accessibility to jobs by Private Vehicle 2016 AM peak the site is located within the area that has access to 90,000 jobs.
- Accessibility to Key Activity Centres by cycle 2016 AM Peak the site is located within 25 minutes duration to the nearest KAC.
- Accessibility to Key Activity Centres by Public Transport 2016 AM Peak- the site is located within 25 minutes duration to the nearest KAC.
- Accessibility to Key Activity Centres by Private Vehicle 2016 AM Peak the site is located within 10 minutes duration to the nearest KAC.

Statistics New Zealand has recently updated their commuter maps to show the destinations people are travelling to from a selected area. This map is shown in **Figure 5.1** with Prebbleton being selected as shown in green. The main areas that residents from Prebbleton are travelling to are Lincoln (9%), Christchurch Central (5%), Christchurch Central-south (4%), Hornby Central (4%) and Islington -Hornby Industrial (4%). The accessibility to these areas via different travel options is shown for the morning (AM) and evening (PM) commuter peaks in **Table 5.1**.

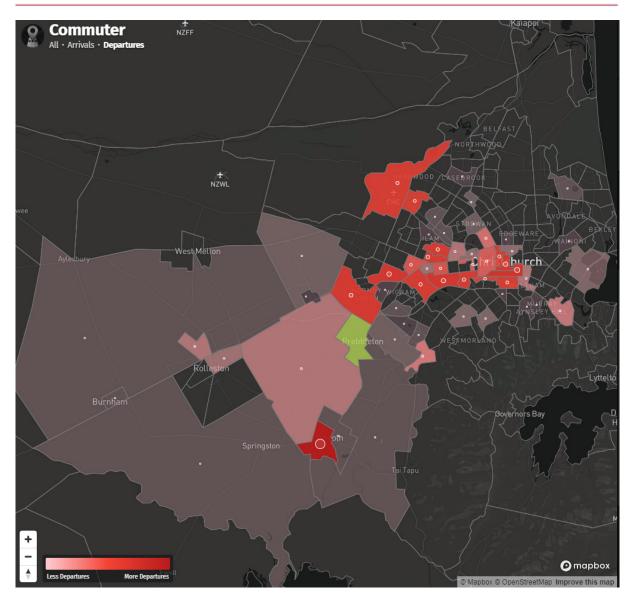
Table 5.1 Travel times to/from popular travel destinations from Prebbleton

	Lincoln /Prebbleton	Christchurch Central / Prebbleton	Christchurch Central-South / Prebbleton	Hornby Central / Prebbleton	Islington – Hornby Industrial / Prebbleton
Private Vehicle – AM peak	8mins to Lincoln	40mins to Central	26mins to Central – south	16mins to Hornby Central	14mins to Islington
Private Vehicle – PM peak	10min to Prebbleton	45mins to Prebbleton	30mins to Prebbleton	16mins to Prebbleton	14mins to Prebbleton
Public Transport – AM peak	16mins to Prebbleton	40mins to Central (express bus)	42mins to Central - south	23mins to Hornby Central	45mins to Islington
Public Transport – PM peak	14mins to Prebbleton	40mins to Prebbleton (express bus)	30mins to Prebbleton (express bus)	26mins to Prebbleton	40mins to Prebbleton
Cycling – AM peak	20 mins to Lincoln	47mins to Central	44mins to Central - south	19mins to Hornby Central	20mins to Islington
Cycling – PM peak	21 mins To Prebbleton	51mins to Prebbleton	44mins to Prebbleton	19mins to Prebbleton	17mins to Prebbleton

Overall, there are similar travel times between Prebbleton and the popular commuter destinations using different modes of transport. The only exception to this is Islington where public transport takes longer than the other modes due to the lack of a direct service.

In summary Prebbleton is well connected to the surrounding road, cycling and public transport network.





 $\textbf{Figure 5.1} \ \textbf{Prebbleton departure destinations (shown in red)} - \textbf{source Stats NZ} \ . \\$

Public Transport

The established bus route between Christchurch and Lincoln, along Springs Road and Birches Road is considered unlikely to change in future. Service reviews are undertaken every five years by the Regional Council (Environment Canterbury). SDC liaise with Environment Canterbury regarding the provision of public transport to ensure sustainable growth in townships. [2]

At the time of writing it is understood that there are no proposed bus route changes proposed in Prebbleton. Bus route 80 has recently added an express option that travels along the newly finished CSM2. Currently there are only two express services that run between Lincoln and Christchurch central (including pick up and drop off in Prebbleton), one in

https://www.selwyn.govt.nz/__data/assets/pdf_file/0008/147977/Selwyn-2031-Finalr.pdf



morning peak and one in afternoon peak. It is likely given the similar travel times between private vehicles and express route that more express services will be added if this route gains popularity.

Walking and Cycling

The Christchurch to Little River Rail Trail has experienced strong growth in walking and cycling and is part of the national NZ Cycle Trail network ^[3]. The section between Prebbleton and Lincoln is used by upwards of 200 cyclists each day. Future cycle links are planned as indicated by the Walking and Cycling Strategy for Selwyn District between the cycle trail and Prebbleton in conjunction with any future retail and commercial developments in the town centre.

A key future project is a cycleway between Templeton and Prebbleton which is in the draft LTP for 2023/24 and is shown in **Figure 5.2**. This will aim to connect Selwyn's high growth eastern townships to the wider city cycle networks via the Rail Trail [4]. This connection links the frontage of the site along Trents Road towards Prebbleton town centre that links to CCC Major Cycleway Routes and to Templeton.

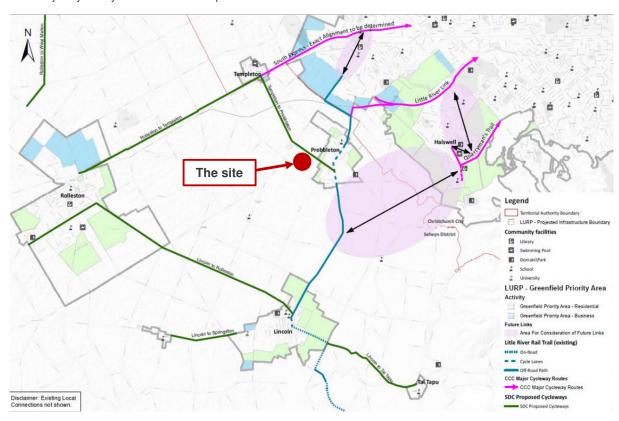


Figure 5.2 Future cycle network including existing routes. (source SDC walking and cycling strategy -2018)

New pathways and connections have been provided for in the design of CSM2 that link Rolleston to south of Templeton, while an extension of the Rail Trail to the north of Prebbleton as indicated in **Figure 5.2**. The new motorway also includes overpasses, underpasses and interchange structures that have dedicated footpath and cycleway facilities as part of their designs [5]

 $^[3] https://www.selwyn.govt.nz/__data/assets/pdf_file/0008/282563/Final-2018-Walking-and-Cycling-Strategy_v3-Adopted.pdf$

^[4] https://www.selwyn.govt.nz/__data/assets/pdf_file/0008/282563/Final-2018-Walking-and-Cycling-Strategy_v3-Adopted.pdf

^[5] https://www.selwyn.govt.nz/__data/assets/pdf_file/0008/282563/Final-2018-Walking-and-Cycling-Strategy_v3-Adopted.pdf



The Prebbleton Structure Plan includes a future walking and cycling route around Prebbleton as shown on Figure 5.3. This combines existing routes and open spaces to enable a circular walking and cycling route around Prebbleton. The site is adjacent to part of this route that spans a distance of 5.4km.

Figure 6. Future walking and cycling route around Prebbleton

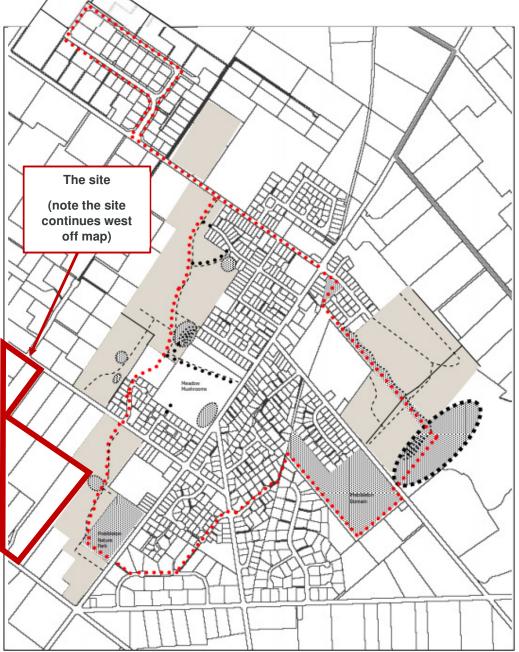


Figure 5.3 Prebbleton future walking and cycling route (source: Prebbleton Structure Plan)



6. Travel Characteristics and Trip Generation

6.1 Trip Generation

The land use composition of the Site is approximately 820 low to medium density residential dwellings. Trip rates can be calculated using existing trip rate estimates and past surveys. A summary of the most recent trip rates for residential dwellings are shown in **Table 6.1**. A peak hour trip rate of 0.9 two-way trips per dwelling is chosen as a conservatively high figure, hence the proposed residential development of 820 dwellings will generate 738 additional trips in the peak hour

Table 6.1 Trip Rate Comparison

Source	Daily (vehicles per day)	Peak Hour (vehicles per hour)	Daily Rate Applied to Site	Peak Hour Rate Applied to Site
Trips Database Bureau	8.2/dwelling	0.9/dwelling	6,724	738
RTA	9.0/dwelling	0.85/dwelling	7,380	697
Average	8.6/dwelling	0.875/dwelling	7,052	718

6.2 Trip Distribution

The anticipated number of trips from the Site (738 trips in the peak hour) have been distributed using Statistics New Zealand 2018 census Journey to Work data (which can be accessed at https://www.stats.govt.nz/tools/commuter-waka-2018-census-data-visualisation). The final distribution of the trips was decided with the following steps:

- 1) A future growth rate of 2.8% per annum (calculated from Statistics New Zealand 2018-28 population medium growth projections for Selwyn District⁶) was applied to the 2020 traffic counts (which are detailed in section 7.2) to estimate the impacts of ten years of development growth in the District. This inclusion of ten years growth is consistent with the RR422 guidelines for plan changes. The resultant 28% growth was added to all 2020 intersection turning movements to estimate likely 2030 traffic flows as a baseline for this assessment.
- 2) Peak period destinations for Prebbleton traffic were estimated based on Journey to Work (JTW) data the JTW split for the Prebbleton Statistical Area 2 (SA2) area in 2018 was Christchurch (67%), Prebbleton (11%), Lincoln (11%) and Rolleston (11%). Given the much higher growth forecast between 2018-28 in Selwyn District (28% population growth) relative to the corresponding medium growth projection for Christchurch City (9% population growth) and likely growth in commercial activity and the emergence of new schools in Selwyn District, the trip distribution split has been modified slightly to reflect more local trips with Christchurch (55%), Prebbleton (15%), Lincoln (15%) and Rolleston (15%). This is considered to be a conservative assessment as it is predominantly based on commuter travel which tends towards longer trips compared to education, shopping and recreational trips.
- 3) The inbound/outbound split for the development traffic is based on Shands Road northbound/southbound through split at Shands/Trents intersection (30% inbound 70% outbound in morning peak and 66% inbound 34% outbound in evening peak)
- 4) The distribution assumes that 75% of Christchurch and Prebbleton town centre bound traffic travels via Trents Road and 25% via Hamptons Road. The rationale for this is that most of the development site it will be quicker to travel northbound through the site rather than increase travel distance by accessing the wider network via Hamptons Road. This is conservatively high as some traffic may access the wider network via other local roads including Sterling Drive and Lindsay Drive.
- 5) Similarly, the distribution assumes that 25% of Christchurch and Prebbleton town centre bound traffic travels via Trents Road and 75% via Hamptons Road. The rationale for this is that most of the development site it will be quicker to travel southbound through the site rather than increase travel distance by accessing the wider network via Trents Road.

 $http://archive.stats.govt.nz/browse_for_stats/population/estimates_and_projections/SubnationalPopulationProjections_HOTP2013base-2043.aspx\#gsc.tab=0$



- 6) Splits between Shands Road and Springs Road for Christchurch-bound traffic based on the tidal flow directional through volumes on each corridor (76% Shands 24% Springs in morning peak and 72% Shands 28% Springs in evening peak)
- 7) Checksums were applied to ensure that the total increase in traffic loaded across all intersections reconciles with the traffic generation for travel to/from Christchurch, Prebbleton, Lincoln, Rolleston and total trips.

Overall, the above methodology provided a robust and conservative trip distribution estimation for the new trips generated by the Plan Change. The trip distribution diagram for each intersection movement can be seen in Appendix B.

6.3 Parking Supply and Demand

Car parking for the Plan Change area will be provided on site within each lot. Vehicle access and parking layouts of the proposal will be designed to comply with District Plan requirements and will be detailed at resource consenting stages.



7. Network Effects Assessment

7.1 Introduction

To provide a comprehensive assessment of effects, three tasks have been undertaken and are reported in this section of the report as follows:

- Surveys were undertaken at the four intersection bordering the site
- A capacity assessment has been undertaken of the Springs and Shands Road corridors with and without the development traffic
- Intersection modelling of the four intersections using SIDRA intersection software has been undertaken to assess the current and future performance of the intersections with and without development traffic.

7.2 Traffic Surveys

Manual intersection movement surveys were undertaken at each of the four intersections to inform this ITA. This was undertaken on Thursday 22 October 2020 during the typical evening peak period of 4:00-6:00pm and on Friday 23 October 2020 during the typical morning peak period of 7:00-9:00am. Both the morning and evening peaks were surveyed for the intersections. The intersections were collected during fine weather conditions.

The results of the survey show that the AM peak hour is between 7:15-8:15am and the PM peak hour is between 4:30-5:30pm. The turning movements during the survey are included in Appendix B.

The results of the traffic surveys were used to inform the capacity assessment and the SIDRA intersection modelling.

7.3 Capacity Assessment

The Shands Road and Springs Road arterials are expected to experience an increase in traffic demand as a result of the Plan Change as a result of traffic interactions between the site and Christchurch City and between the site and Prebbleton town centre.

The forecast 2030 traffic volumes with and without development traffic (and as are consistent with the flows forecast and applied to the SIDRA intersection modelling assessment) have been applied to assess whether there is sufficient midblock link capacity to the north of Trents Road with and without the development. The forecasts volumes have been compared to the capacity of each corridor in **Table 7.1Error! Reference source not found.** The capacity of each corridor has been calculated using a best practice assessment based on Austroads guidance as follows:

- Springs Road capacity taken from Austroads Guide to Traffic Management Part 3 Table 6.1 Typical midblock capacities for urban undivided roads with interrupted flow - 900 vehicle per lane per hour
- Shands Road capacity taken from Austroads Guide to Traffic Management Part 3 section 5.1.1 Uninterrupted flow facilities single-lane flow - 1800 vehicles per lane per hour

Table 7.1 Capacity Assessment

	Shar	nds Road (north of Tr	ents)	Sprir	ngs Road (north of Tr	ents)
Traffic Volumes	AM NB	AM SB	PM NB	PM SB	AM NB	AM SB	PM NB	PM SB
2020	963	424	574	1083	398	313	534	477
2030 (No Development)	1233	543	735	1386	509	401	684	611
2030 (With Development)	1396	636	834	1579	617	464	760	759
Capacity (Austroads)		1800			900			
V/C Ratios	AM NB	AM SB	PM NB	PM SB	AM NB	AM SB	PM NB	PM SB
2020	0.54	0.24	0.32	0.60	0.44	0.35	0.59	0.53



2030 (No Development)	0.68	0.30	0.41	0.77	0.57	0.45	0.76	0.68
2030 (With Development)	0.78	0.35	0.46	0.88	0.69	0.52	0.84	0.84

The assessment demonstrates that with the addition of ten years of background traffic growth (at 2.8% per annum) the Shands Road corridor has a volume to capacity (V/C) ratio of 0.68 northbound in the morning peak and 0.77 southbound in the evening peak hour. These increase to 0.78 and 0.88 respectively with the addition of development traffic, indicating there is residual link capacity on this corridor.

The corresponding assessment for Springs Road shows that in with ten years background growth (at 2.8% per annum) the evening peak has a V/C of 0.76 which increases to 0.84 with development traffic. Both corridors have sufficient capacity to accommodate the full development of the site.

7.4 SIDRA Modelling Approach

To assess the potential effects at the key intersections in the vicinity of the plan change site, three scenarios have been assessed:

- 1) Base Scenario (2020) This scenario shows the existing performance of the four intersections using peak hour movements attained from the site surveys for both the morning and evening peaks. The intersection volumes from the October 2020 surveys form the basis of the assessment, and on-site observations of queue lengths have been used to calibrate the performance of the intersection in terms of queue lengths on the minor leg approaches.
- 2) Future Base Scenario (2030) This scenario adds forecast growth of 2.8% per annum to the surveyed turning movement volumes used in the Base Scenario. This scenario, therefore, predicts the future performance of the four intersections in the morning and evening peak hours without the development. This scenario also assumes the Shands / Trents and Shands / Hamptons intersection upgrade to dual roundabouts. It is assumed that the Springs / Hamptons intersection will be upgraded to a single lane roundabout. The Springs / Trents intersection is assumed to remain as a stop-controlled intersection.
- 3) Future Development Scenario (2030) The final scenario adds the new trips corresponding with the full development of the plan change site using the trip generation and trip distribution methodology outlined in section 6.1 and section 6.2 respectively. This scenario also assumes the Shands / Trents and Shands / Hamptons intersection upgrade to dual roundabouts and Springs / Hamptons intersection upgrade to a single lane roundabout, with the Springs / Trents intersection remaining stop-controlled.

SIDRA Results

SIDRA Intersection offers a range of outputs for any given model. The outputs selected for this analysis are:

- Average delay (seconds):
 - Average delay is the average delay experienced by vehicles travelling through an intersection and includes deceleration, queuing, stopping and acceleration.
- Level of Service (LOS):

The LOS is calculated as a function of the delay, and generally describes the traffic conditions in terms of travel time, volume, capacity, freedom to manoeuvre and convenience. The LOS ranges from A to F where A represents the least impediment to vehicle movement and F represents heavy congested conditions.

A general description of level of service is shown in Table 7.2.

Table 7.2 Level of Service (LOS) General Descriptions

Level of Service Band	General Traffic Flow Description	
LOS A	Primarily free-flow operation	
LOS B	Reasonably unimpeded operation	
LOS C	Stable operation	



LOS D	A less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed
LOS E	Characterised by unstable operation and significant delay
LOSF	Characterised by flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay

Typically, in assessments of intersections in peak demand periods the industry best practice is to keep the operation of an intersection at or below LOS E in peak periods. A full set of SIDRA turning movement summaries are included in Appendix C.

7.5 Intersection Assessment – Base Scenario (2020)

The results of the Base Scenario (2020) can be found in **Table 7.3** and **Table 7.4**. The overall intersection performance is considered that of the worst approach for stop-controlled intersections and the volume weighted average across all approaches for roundabouts. This is in alignment with SIDRA guidance and industry best practice. As a general rule LOS E or better during peak periods is considered to be acceptable. LOS E and F performance are highlighted in blue and red respectively

The two Shands road intersections are currently operating at LOS E and F, demonstrating that they are currently at or near capacity. With the addition of ten years background traffic growth they would both be operating well over capacity and the imminent roundabout upgrades planned by Council will be required irrespective of the plan change application.

Table 7.3 SIDRA Results - Base Scenario (2020) AM Peak

Intersection	Approach	Average Delay (sec)	Level of Service
Shands Road /	Trents Road East	41.3	Е
Trents Road	Shands Road North	1.0	-
CTOP	Trents Road West	29.8	D
STUP	Shands Road South	0.5	-
	Intersection	41.3	E
Shands Road /	Hamptons Road East	16.0	С
Hamptons Road	Shands Road North	1.0	-
STOP	Hamptons Road West	17.6	С
STUP	Shands Road South	0.9	-
	Intersection	17.6	С
Springs Road /	Hamptons Road East	11.4	В
Hamptons Road	Springs Road North	0.6	-
CTOP	Hamptons Road West	11.2	В
STUP	Springs Road South	1.3	-
	Intersection	11.4	В
Springs Road /	Trents Road East	12.5	В
Trents Road	Springs Road North	0.8	-
	Trents Road West	10.3	В
STUP	Springs Road South	0.4	-
	Intersection	12.5	В



Table 7.4 SIDRA Results - Base Scenario (2020) PM Peak

Intersection	Approach	Average Delay (sec)	Level of Service
Shands Road /	Trents Road East	65.9	F
Trents Road	Shands Road North	1.0	-
CTOD	Trents Road West	86.0	F
STUP	Shands Road South	1.7	-
	Intersection	86.0	F
Shands Road /	Hamptons Road East	46.4	Е
Hamptons Road	Shands Road North	0.7	-
CTOP	Hamptons Road West	36.0	Е
STUP	Shands Road South	2.7	-
	Intersection	36.0	E
Springs Road /	Hamptons Road East	13.5	В
Hamptons Road	Springs Road North	1.4	-
STOP	Hamptons Road West	14.4	В
STUP	Springs Road South	1.0	-
	Intersection	14.4	В
Springs Road /	Trents Road East	15.1	C
Trents Road	Springs Road North	1.2	-
STOP	Trents Road West	14.0	В
SIUI	Springs Road South	0.3	-
	Intersection	15.1	С

7.6 Intersection Assessment – Future Base Scenario (2030)

The SIDRA results of the Future Base Scenario (2030) can be found in Table 7.5 and Table 7.6.

Table 7.5 SIDRA Results - Future Base Scenario (2030) AM Peak

Intersection	Approach	Average Delay (sec)	Level of Service
Shands Road /	Trents Road East	10.7	В
Trents Road	Shands Road North	6.4	Α
	Trents Road West	11.8	В
	Shands Road South	7.0	A
	Intersection	7.2	A
Shands Road /	Hamptons Road East	8.9	Α
Hamptons Road	Shands Road North	6.5	Α
	Hamptons Road West	9.7	Α
	Shands Road South	6.7	A
	Intersection	6.9	A
	Hamptons Road East	7.1	A



Intersection	Approach	Average Delay (sec)	Level of Service
Springs Road /	Springs Road North	5.6	A
Hamptons Road	Hamptons Road West	7.0	A
	Springs Road South	5.7	A
	Intersection	5.9	A
Springs Road /	Trents Road East	15.4	С
Trents Road	Springs Road North	0.9	-
STOP	Trents Road West	11.7	В
	Springs Road South	0.4	-
	Intersection	15.4	С

Table 7.6 SIDRA Results - Future Base Scenario (2030) PM Peak

Intersection	Approach	Average Delay (sec)	Level of Service
Shands Road /	Trents Road East	13.7	В
Trents Road	Shands Road North	7.2	Α
	Trents Road West	9.3	A
	Shands Road South	6.7	А
	Intersection	7.4	A
Shands Road /	Hamptons Road East	13.2	В
Hamptons Road	Shands Road North	7.3	A
	Hamptons Road West	9.1	A
	Shands Road South	7.0	А
	Intersection	7.7	A
Springs Road /	Hamptons Road East	7.3	A
Hamptons Road	Springs Road North	6.4	A
	Hamptons Road West	8.5	А
	Springs Road South	6.0	A
	Intersection	6.6	A
Springs Road /	Trents Road East	21.0	С
Trents Road	Springs Road North	1.4	-
	Trents Road West	20.1	С
SIUP	Springs Road South	0.4	-
	Intersection	20.1	С

7.7 Intersection Assessment – Future Development Scenario (2030)

The SIDRA results of the Future Development Scenario (2030) can be found in **Table 7.7** and **Table 7.8**.



Table 7.7 SIDRA Results - Future Development Scenario (2030) AM Peak

Intersection	Approach	Average Delay (sec)	Level of Service
Shands Road /	Trents Road East	13.1	В
Trents Road	Shands Road North	6.4	A
	Trents Road West	14.8	В
	Shands Road South	8.6	A
	Intersection	8.7	A
Shands Road /	Hamptons Road East	10.1	В
Hamptons Road	Shands Road North	6.6	A
	Hamptons Road West	10.3	В
	Shands Road South	7.2	A
	Intersection	7.5	A
Springs Road /	Hamptons Road East	7.8	A
Hamptons Road	Springs Road North	6.2	A
	Hamptons Road West	8.2	A
	Springs Road South	5.7	A
	Intersection	6.5	A
Springs Road / Trents Road	Trents Road East	19.4	С
	Springs Road North	1.5	-
CTOP	Trents Road West	13.0	В
STUP	Springs Road South	0.5	-
	Intersection	19.4	С

Table 7.8 SIDRA Results - Future Development Scenario (2030) PM Peak

Intersection	Approach	Average Delay (sec)	Level of Service
Shands Road /	Trents Road East	19.7	В
Trents Road	Shands Road North	7.4	A
	Trents Road West	9.9	A
	Shands Road South	7.2	A
	Intersection	8.2	A
Shands Road /	Hamptons Road East	15.9	В
Hamptons Road	Shands Road North	7.8	A
	Hamptons Road West	9.5	A
	Shands Road South	7.5	A
	Intersection	8.4	A
Springs Road /	Hamptons Road East	7.9	A
Hamptons Road	Springs Road North	7.0	A
	Hamptons Road West	9.2	A
	Springs Road South	6.4	A



Intersection	Approach	Average Delay (sec)	Level of Service
	Intersection	7.2	A
Springs Road /	Trents Road East	28.3	D
Trents Road	Springs Road North	2.6	-
CTOP	Trents Road West	25.5	D
STOP	Springs Road South	0.6	-
	Intersection	25.5	D

7.8 Comparison of Scenarios

To consider the effects of the development it is helpful to see the results of intersection performance for each scenario side-by-side. The Future Base Scenario (2030) and the Future Development Scenario (2030) are shown in the following tables for each of the intersections. The Shands Road / Trents Road intersection performance comparison for both the AM and PM peak are shown in **Table 7.9**. The change in average delay to the base is small for all movements with no more than 6 seconds additional delay and average delays increasing by up 1-2 seconds only. None of the delay changes result in a worsening of LOS and this level of changes will not be noticeable to road users.

Table 7.9 Shands Road / Trents Road Intersection Performance Comparison

Intersection	Approach	Average	Delay (sec)	Level of Service		
		Future Base	Future Development	Future Base	Future Development	
Shands Road /	Trents Road East	10.7	13.1	В	В	
Trents Road	Shands Road North	6.4	6.4	Α	Α	
	Trents Road West	11.8	14.8	В	В	
	Shands Road South	7.0	8.6	Α	Α	
AM Peak	Intersection	7.2	8.7	Α	Α	
Shands Road /	Trents Road East	13.7	19.7	В	В	
Trents Road	Shands Road North	7.2	7.4	Α	Α	
	Trents Road West	9.3	9.9	Α	Α	
	Shands Road South	6.7	7.2	Α	Α	
PM Peak	Intersection	7.4	8.2	A	Α	

The Shands Road / Hamptons Road intersection performance comparison for both the AM and PM peak are shown in **Table 7.10**. Delays on each approach increase by no more than three seconds with average delay increasing by less than one second which will not be noticeable to road users.

Table 7.10 Shands Road / Hamptons Road Intersection Performance Comparison

Intersection	Approach	Average D	elay (sec)	Level of Service		
		Future Base	Future Development	Future Base	Future Development	



Shands Road /	Hamptons Road East	8.9	10.1	Α	В
Hamptons Road	Shands Road North	6.5	6.6	Α	А
	Hamptons Road West	9.7	10.3	Α	В
	Shands Road South	6.7	7.2	А	А
AM Peak	Intersection	6.9	7.5	A	A
Shands Road /	Hamptons Road East	13.2	15.9	В	В
Hamptons Road	Shands Road North	7.3	7.8	Α	А
	Hamptons Road West	9.1	9.5	А	А
	Shands Road South	7.0	7.5	Α	Α
PM Peak	Intersection	7.7	8.4	A	A

The Springs Road / Hamptons Road intersection performance comparison for both the AM and PM peak are shown in **Table 7.11**. The change in average delay to the base is less than one second. None of the delay changes result in a worsening of LOS and any changes will not be noticeable to road users.

Table 7.11 Springs Road / Hamptons Road Intersection Performance Comparison

Intersection	Approach	Average	Delay (sec)	Level of Service		
		Future Base	Future Development	Future Base	Future Development	
Springs Road /	Hamptons Road East	7.1	7.8	Α	А	
Hamptons Road	Springs Road North	5.6	6.2	Α	А	
	Hamptons Road West	7.0	8.2	Α	Α	
	Springs Road South	5.7	5.7	А	Α	
AM Peak	Intersection	5.9	6.5	Α	A	
Springs Road /	Hamptons Road East	7.3	7.9	А	А	
Hamptons Road	Springs Road North	6.4	7.0	А	Α	
	Hamptons Road West	8.5	9.2	А	Α	
	Springs Road South	6.0	6.4	А	Α	
PM Peak	Intersection	6.6	7.2	A	A	

The Springs Road / Trents Road intersection performance comparison for both the AM and PM peak are shown in **Table 7.12**. The Trents Road West and East approaches of the stop-controlled arrangement will experience small increases in delay of seven and five seconds respectively in the PM Peak and a reduction of level of service from LOS C to LOS D. This is an acceptable intersection LOS during peak periods and indicates that the intersection will perform well as a stop-controlled intersection with the addition of plan change traffic and does not require upgrading to a roundabout as a result of this plan change. **Table 7.12** Springs Road / Trents Road Intersection Performance Comparison

Intersection	Approach	Average D	Pelay (sec)	Level of	of Service	
		Future Base	Future Development	Future Base	Future Development	
	Trents Road East	15.4	19.4	С	С	



Intersection	Approach	Average D	Delay (sec)	Level of Service		
Springs Road /	Springs Road North	0.9	1.5	NA	NA	
Trents Road	Trents Road West	11.7	13.0	В	В	
STOP	Springs Road South	0.4	0.5	NA	NA	
AM Peak	Intersection	15.4	19.4	С	С	
Springs Road /	Trents Road East	21.0	28.3	С	D	
Trents Road	Springs Road North	1.4	2.6	NA	NA	
CTOD	Trents Road West	20.1	25.5	С	D	
STOP	Springs Road South	0.4	0.6	NA	NA	
PM Peak	Intersection	21.0	28.3	С	D	

7.9 Summary of Development Effects

This section has described the performance changes on the road network due to increased traffic generation from the plan change site during the weekday morning and evening peak periods.

The assessment demonstrates that with ten years of background traffic growth, both the Shands Road corridor and the Springs Road corridor have sufficient capacity to accommodate the full development of the site. The volume to capacity (V/C) ratio for Shands Road is expected to increase from 0.68 northbound in the morning peak and 0.77 southbound in the evening peak hour, to 0.78 and 0.88 respectively with the addition of development traffic. The corresponding assessment for Springs Road shows that with ten years background growth the evening peak has a V/C of 0.76 which increases to 0.84 with development traffic.

The results of the SIDRA intersection modelling for the four adjacent intersections show that the additional traffic from the development of the Plan Change area will perform well within capacity for all intersections, assuming that the Shands Road roundabouts that are planned to be installed by Council in the next four years are installed. These roundabouts are required irrespective of this plan change application. The roundabout at Springs Road and Hamptons Road scheduled for 2024/25 can also accommodate the plan change traffic with minimal increase in delays.

Notably the existing stop-controlled intersections at Springs Road and Trents Road has sufficient capacity to accommodate the plan change traffic as well as ten years of future background traffic growth.

Overall, the changes in road and intersection performance in relation to the Plan Change are minimal and the effects are considered acceptable in terms of transport, subject to the construction of the two Shands Road roundabouts as intended by Council in the 2021-24 funding cycle.



8. Strategic Planning Framework

Canterbury Regional Land Transport Plan 2015 - 2025

The Canterbury Regional Land Transport Plan 2015 – 2025 describes a list of primary objectives to achieve the vision of "Canterbury has an accessible, affordable, integrated, safe, resilient and sustainable transport system"[7].

These primary objectives are:

- · Progressively reduce transport-related fatalities and serious injuries
- Improve levels of access in an environmentally sustainable way by increasing the attractiveness of public transport, walking and cycling, so there is greater use of these modes:
 - For public transport the focus is on timeliness, convenience, affordability, efficiency, connectedness, and sustainability; and
 - For walking and cycling the focus is on safety, amenity, convenience, connectivity and being able to take a direct route
- Increased capability for appropriate roads and bridges to carry heavy vehicles
- All roads comply with One Network Road Classification performance measures
- Improve journey time reliability on key corridors, with a focus on freight, public transport and tourism
- · Improve access to freight hubs
- Resilience routes are in place for strategic routes that are most at risk of disruption
- · Reduce the number and duration of road closures
- Identify routes that are at risk of being impacted by climate change, and how to manage these risks to improve resilience
- · Increased uptake of energy efficient and environmentally sustainable vehicles
- · Increased transport and land use integration
- · Reduced air and water pollution
- Improved storm water management

The Plan Change will facilitate a development that will not give rise to adverse effects on the strategic transport network and does not require any new roading links. The Site is located within proximity to public transport services and will therefore provide for a choice of travel modes. Environment Canterbury is proposing future changes to the Christchurch bus network which are expected to increase bus services near the site to further improve public transport accessibility.

Canterbury Regional Public Transport Plan 2018 – 2028

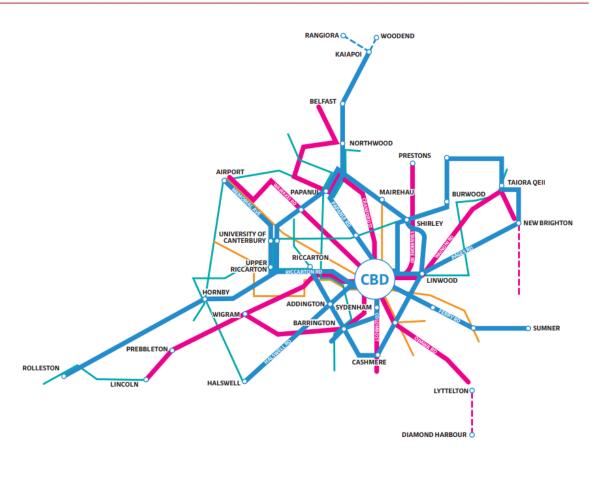
The Canterbury Regional Public Transport Plan 2018-2028 sets out Environment Canterbury's objectives and policies for delivering public transport in Canterbury.

One of the key objectives of the plan is to achieve "A network of public transport services in the Greater Christchurch and Timaru urban areas that provides people with access to key destinations." This includes services to and from the satellite centres, including Prebbleton. In order to achieve this objective, four new high frequency routes are proposed. One of these being the already implemented Lincoln to Christchurch CBD express service. With these four routes and increased frequency, this will overall improve public transport accessibility in Christchurch where 47% more people will be able to travel from home to the city within 30 minutes.

The proposed route network is shown in Figure 8.1, which shows a high frequency route between Prebbleton and the Christchurch CBD that was recently implement with the opening of CSM2 in September 2020. This route travels along Springs Road corridor and stops at the existing bus stops. As a result, there will be improved public transport accessibility between the Site and the Christchurch CBD.

Page 4 of Environment Canterbury's 'Canterbury Regional Land Transport Plan 2015 – 2025' (June 2018)





Current high frequency routes
Additional high frequency routes
City connectors
Cross-town links

Figure 8.1 Proposed Changes to the Christchurch Bus Network

8.1 Local Policy Environment

Selwyn District Plan

Objectives and policies

An assessment of the Plan Change against the transport related objectives and policies in the District Plan is included in **Table 8.1**.

Table 8.1 SDC District Plan Objectives and Policies

Selwyn District Plan Objectives and Policies	Assessment	Comments
Township Volume / B2 Physical Resources		



Selwyn District Plan Objectives and Policies	Assessment	Comments
Objective B2.1.1 An integrated approach to land use and transport planning to ensure the safe and efficient operation of the District's roads, pathways, railway lines and airfields is not compromised by adverse effects from activities on surrounding land or by residential growth.	Consistent	The Plan Change will form new Local Major Roads and Local Intermediate Roads within the site to connect to the wider road network via Trents Road and Hamptons Road. The residential development is proposed to be of a similar nature to the existing residential area directly east of the site. The development is proposed in a location that can accommodate the growth whilst both ensuring safety and efficiency of transport operation.
Objective B2.1.2 An integrated approach to land use and transport planning to manage and minimise adverse effects of transport networks on adjoining land uses, and to avoid "reverse sensitivity" effects on the operation of transport networks.	Consistent	Traffic modelling has demonstrated that the receiving transport network has enough capacity to accommodate the increased trip generation of the Plan Change.
Objective B2.1.3 Future road networks and transport corridors are designed, located and protected, to promote transport choice and provide for: a range of sustainable transport modes; and alternatives to road movement of freight such as rail.	Consistent	The Plan Change takes into account the future road network and transport corridor changes, and considers future public transport network plans and walking and cycling provisions, within and to/from Prebbleton.
Objective B2.1.4 Adverse effects of land transport networks on natural or physical resources or amenity values, are avoided, remedied or mitigated, including adverse effects on the environment from construction, operation and maintenance.	Consistent	The Plan Change can be accommodated by the land transport network and any adverse effects from construction of the residential dwellings and internal roads can be avoided, remedied or mitigated with Temporary Traffic Management Plan(s).
Objective B2.1.5 The future, unrestricted operation of Christchurch International Airport is not jeopardised by "reverse sensitivity" effects from residential development in the Selwyn District.	Not contrary	The future, unrestricted operation of Christchurch International Airport is not expected to be jeopardised by the Plan Change.
Policy B2.1.1 Apply a road hierarchy classification in Selwyn District to recognise the different functions and roles of the District's roads.	Consistent	The Plan Change will apply the road hierarchy classification of Selwyn District and form new Local Major Roads and Local Intermediate Roads within the site to connect to the wider road network via Trents Road and Hamptons Road.
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.	Consistent	As mentioned under Objective B2.1.2, traffic modelling has demonstrated that the receiving transport network has enough capacity to accommodate the increased trip generation of the Plan Change. Furthermore, no accesses and/or future road connections are proposed off Shands Road to reflect the road purpose as an Arterial road with a higher speed environment (80kph) and increased transitions.
Policy B2.1.3 Recognise and protect the primary function of roads classified as State Highways and Arterial Roads in	Consistent	important movement function. The proposed Outline Development Plan of the Plan Change ensures the safe and efficient flow of through traffic on the high speed Arterial, Shands Road, by proposing no new accesses or roads off Shands Road.





Selwyn District Plan Objectives and Policies	Assessment	Comments
Part E, Appendix 7, to ensure the safe and efficient flow of 'through' traffic en route to its destination.		All new internal roads are formed on Trents Road and Hamptons Road which do not act as through movement routes.
Policy B2.1.4(a) Ensure all sites, allotments or properties have legal access to a legal road which is formed to the standard necessary to meet the needs of the activity considering: the number and type of vehicle movements generated by the activity; the road classification and function; and any pedestrian, cycle, public transport or other access required by the activity.	Consistent	The Plan Change will ensure all dwellings have legal access to a legal road that is formed to the appropriate standard required. The new legal roads with the Plan Change will reflect the existing neighbouring residential roads and integrate seamlessly.
Policy B2.1.4(b) Avoid adverse effects on the safe flow of traffic along State Highways and Arterial Roads from new property access, where the speed limit is more than 70 km/hr.	Consistent	No new property accesses are proposed on an Arterial Road where the speed limit is more than 70km/hr. Shands Road and Hamptons Road are both Arterial Roads with a speed limit of 80km/hr. No new property accesses are proposed on these roads.
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.	Consistent	The development of the new internal roads within the Plan Change will integrate with the existing and future transport networks and landuses and is designed and located to maximise vehicle, cycle and pedestrian permeability and accessibility. Public and active transport will be encouraged with the level of pedestrian and cyclist permeability within the site.

District Plan Rules

It is anticipated that at resource consent stage of any development, the transport related District Plan Rules set out in Section C5 LZ Roading (Living Zone Rules – Roads and Transport) of the Township Volume in the Selwyn District Plan will form an appropriate basis for the design and layout of the internal site. However, it is also envisaged that there may be occasional departures from these since, to achieve the optimum urban design outcome, non-compliances may arise and any effects of these non-compliances would be assessed accordingly.



9. Conclusion

The Integrated Transport Assessment (ITA) has been developed in accordance with Waka Kotahi ITA guidelines and support the Assessment of Effects for the Urban Estates Limited (UEL) Private Plan Change application in Prebbleton. The site is 77 hectares on the south-west fringe of Prebbleton. UEL seek to rezone land which is presently zoned as Inner Plains to Living Z and would accommodate up to 820 dwellings. Overall, the development that would be facilitated by the plan change will result in an increased level of traffic activity compared to the current zoning.

The location has good accessibility by all modes to key destinations in the Greater Christchurch area and future planned infrastructure upgrades in the Selwyn District Council draft Long Term Plan (2021-31) will deliver important safety and efficiency improvements in the vicinity of the site including the installation of large rural roundabouts at Shands/Hamptons and Shands/Trents intersections. Modelling has demonstrated that these roundabouts are required in the near future irrespective of the proposed plan change.

A comprehensive capacity assessment and SIDRA intersection modelling assessment has been undertaken to understand the effects of increased traffic volumes associated with the plan change on Springs Road and Shands Road, and to robustly model the impact on the performance of nearby intersections for both the morning and evening peak hours. Three scenarios were compared:

- the base scenario (2020) which is calibrated directly from recent traffic counts collected in October 2020,
- the future base scenario without development (2030) assuming continued and sustained growth across the Selwyn District over the next ten years, and
- the future development scenario with the Plan Change (2030) to understand the cumulative effects of the development and background growth.

The results of the analysis demonstrate that the future receiving transport network (including planned upgrades to the two adjacent Shands Road intersections and the Springs Road / Hamptons Road intersection) has sufficient capacity to accommodate the increased traffic that would result from the Plan Change. Notably, the Springs and Shands Road corridors have residual capacity and the stop-controlled intersection on Springs Road at Trents Road adjacent to the site operates with good level of service during peak periods. It is recommended that the speed environments on the adjoining corridors be re-evaluated should the plan change be approved in keeping with a more urban environment.

The Plan Change has been assessed against the relevant transport planning framework contained in regional and local strategies and policies, and overall, it is considered that the proposal is consistent with the transport-related objectives and policies of those documents. It is also able to comply with the District Plan Rules which would be fully assessed at resource consenting stages.

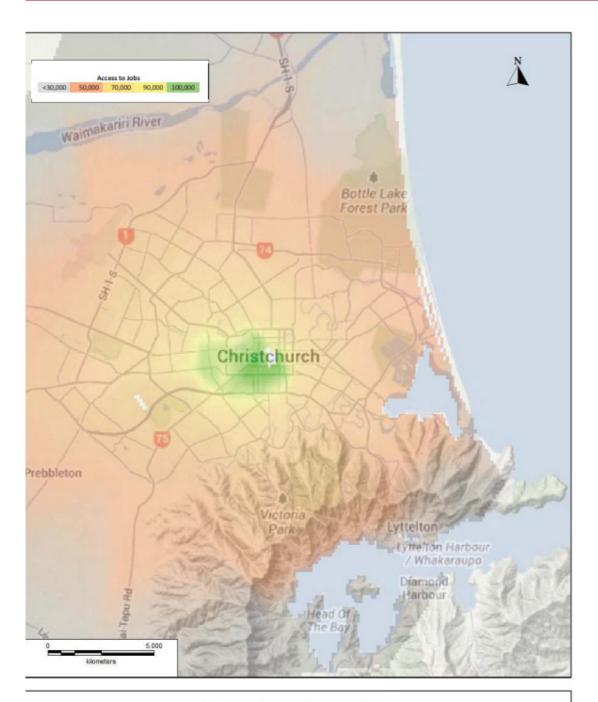
Overall, the proposed Plan Change can be supported from a traffic and transportation perspective and it is considered that there are no traffic and transportation reasons why the Plan Change could not be approved.



Appendix A CCC Integrated Transport Assessment Guidelines - Maps

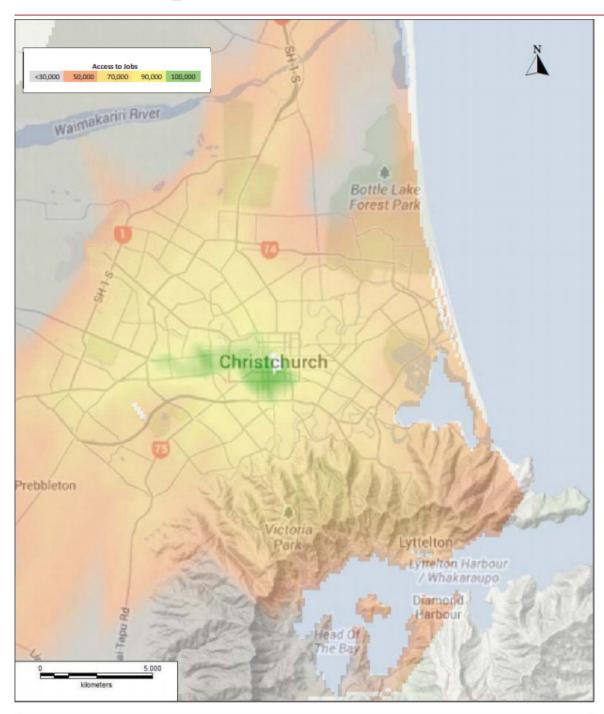






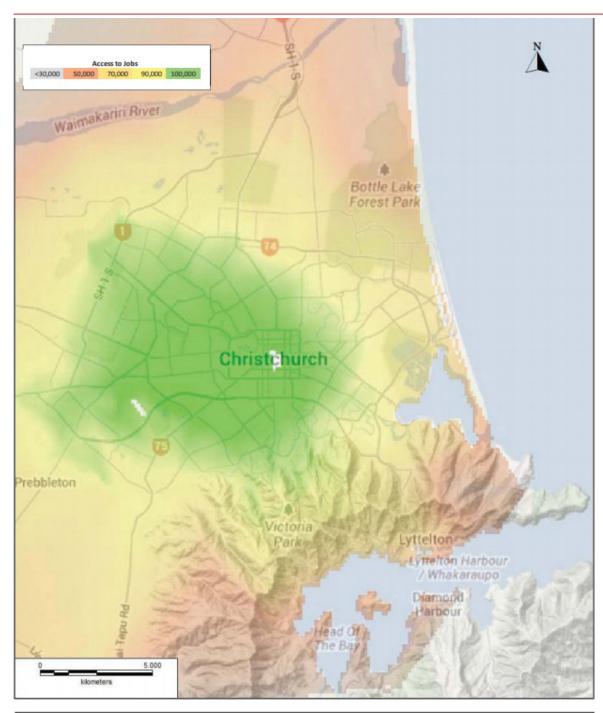
Accessibility to Jobs by Cycle
2016 AM Peak





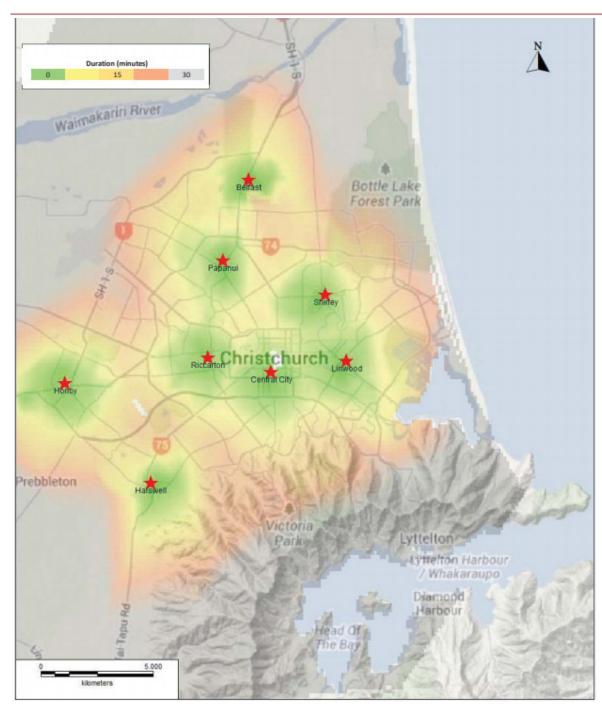
Accessibility to Jobs by Public Transport
2016 AM Peak





Accessibility to Jobs by Private Vehicle
2016 AM Peak

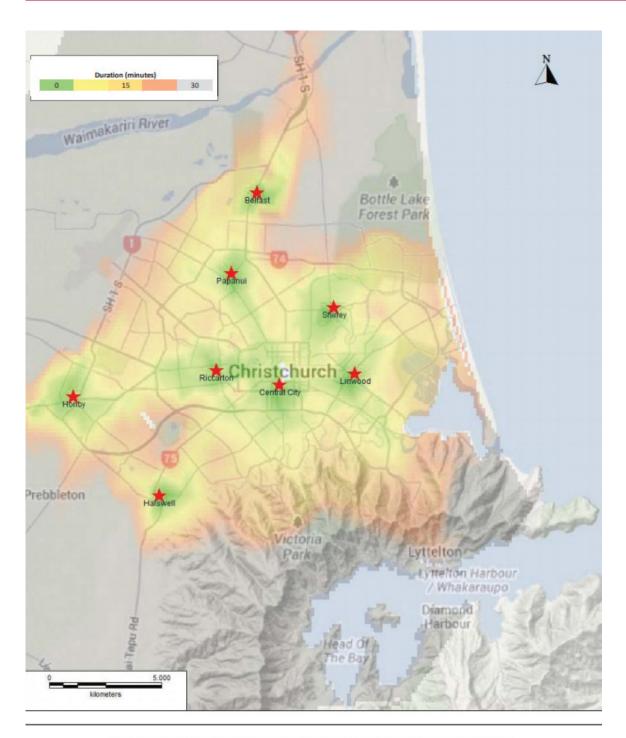




Accessibility to Key Activity Centres by Cycle
2016 AM Peak

A5

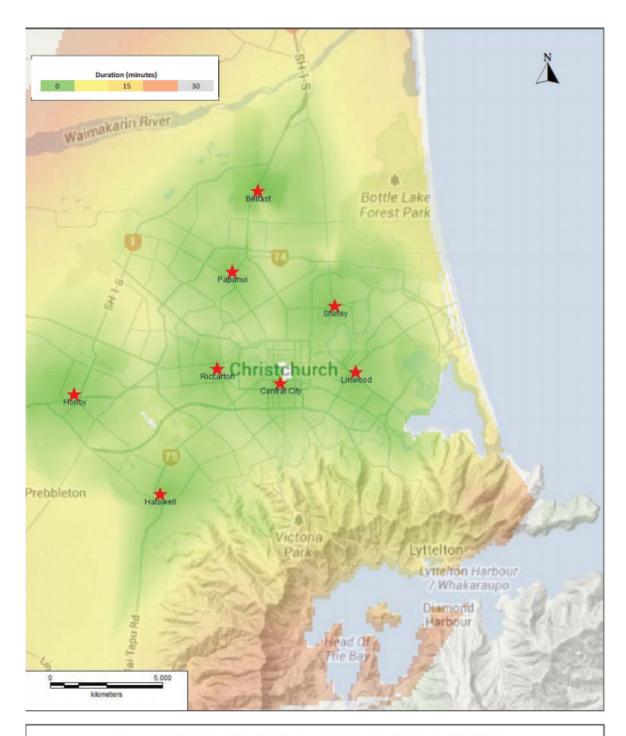




Accessibility to Key Activity Centres by Public Transport
2016 AM Peak

A6





Accessibility to Key Activity Centres by Private Vehicle 2016 AM Peak

T +64 9 486 0898 (Akld) T +64 3 377 4703 (Chch) E office@abley.com Auckland Level 1, 70 Shortland Street PO Box 613 Auckland 1140 New Zealand Christchurch Level 1, 137 Victoria Street PO Box 36446 Christchurch 8146 New Zealand

www.abley.com



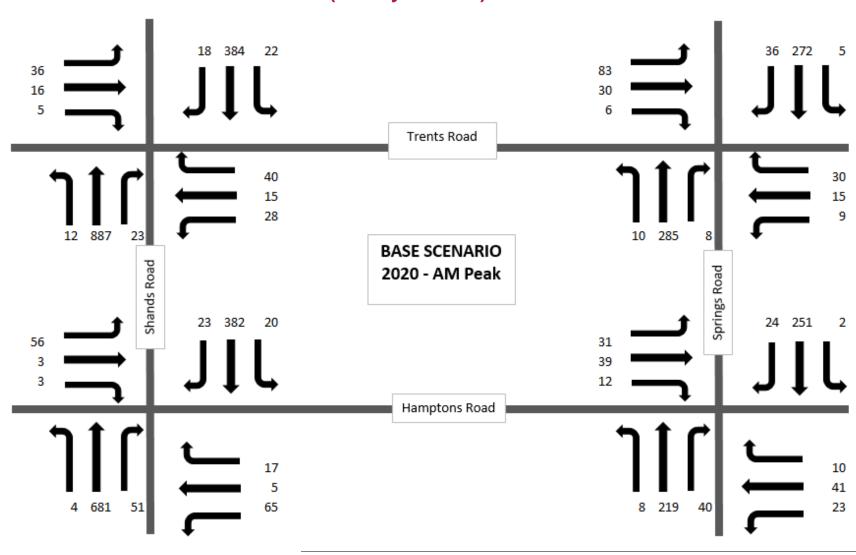


APPENDIX B Survey Results and Trip Distribution



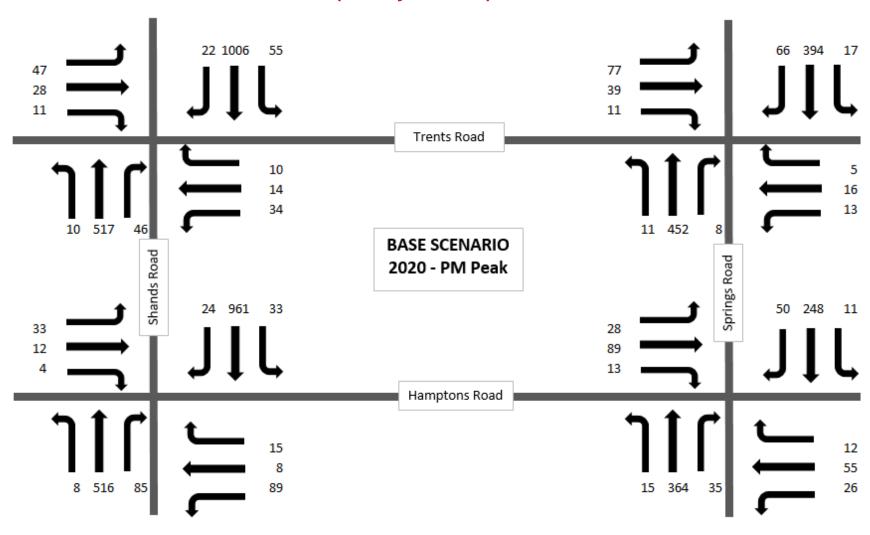


B1.1 Base Scenario 2020 – AM Peak (Survey Results)



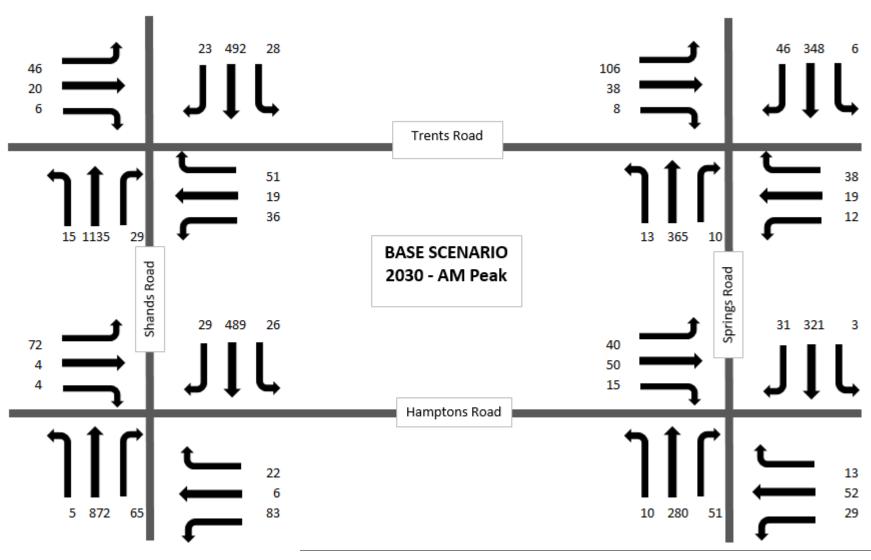


B1.2 Base Scenario 2020 – PM Peak (Survey Results)



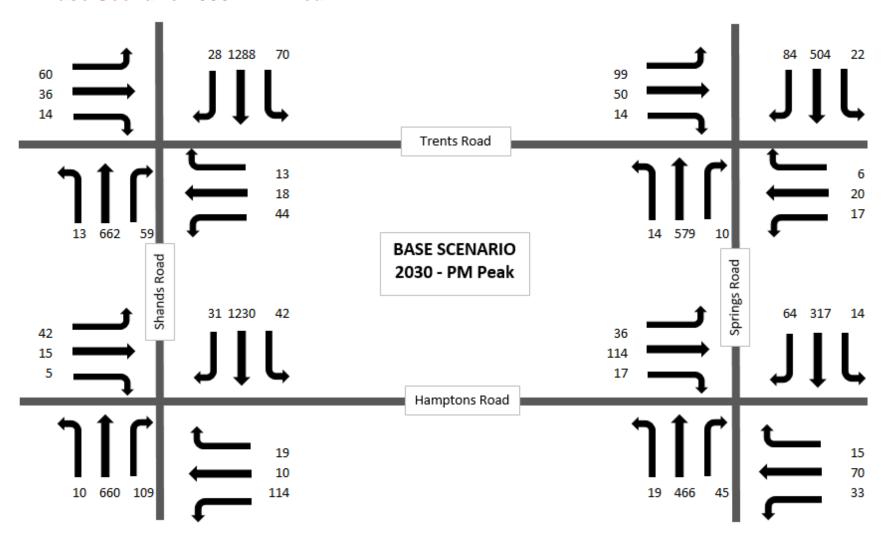


B1.3 Base Scenario 2030 – AM Peak



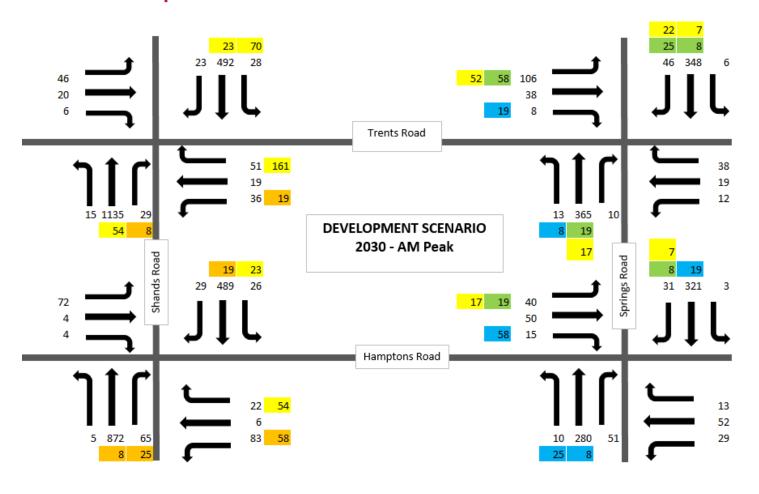


B1.4 Base Scenario 2030 – PM Peak





B1.5 Development Scenario 2030 – AM Peak

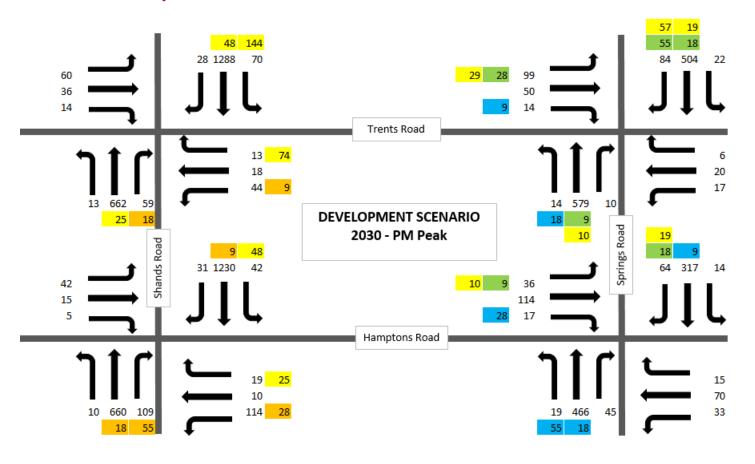


	Dwellings	820
	trips/dwelling	0.9
	Total vehicle movements	738
Prebbleton	15%	111
Rolleston	15%	111
Lincoln	15%	111
Christchurch	55%	406
		738
	Inbound	30%
	Outbound	70%
	Prop Chch use Shands	76%

^{*} The coloured numbers represent the additional development traffic added onto the respective lanes for trip distribution to/from the Site and the four major towns/cities (Prebbleton, Rolleston, Lincoln and Christchurch)



B1.6 Development Scenario 2030 – PM Peak



	Dwellings	820
	trips/dwelling	0.9
	Total vehicle movements	738
Prebbleton	15%	111
Rolleston	15%	111
Lincoln	15%	111
Christchurch	55%	406
		738
	Inbound	66%
	Outbound	34%
	Prop Chch use Shands	72%

^{*} The coloured numbers represent the additional development traffic added onto the respective lanes for trip distribution to/from the Site and the four major towns/cities (Prebbleton, Rolleston, Lincoln and Christchurch)



APPENDIX C SIDRA Movement Summary



USER REPORT FOR SITE

All Movement Classes

Project: Prebbleton PC Models

Template: Movement Summary Report

Site: 101 [Shands Road / Trents Road AM Peak (Site Folder: Existing 2020)]

New Site

Site Category: (None) Stop (Two-Way)

Vehi	cle M	ovemen	t Perfo	rmance										
	Turn	INP		DEM		Deg.		Level of		ACK OF		Effective	Aver.	Aver.
ID		VOLL [Total	JMES HV]	FLO' [Total	WS HV1	Satn	Delay	Service	QUI [Veh.	EUE Dist]	Que	Stop Rate	No. Cycles	Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m m		rate	Cycles	km/h
Sout	hEast:	Trents R	oad E											
4	L2	28	6.0	29	6.0	0.042	11.8	LOS B	0.1	1.1	0.46	0.91	0.46	66.2
5	T1	15	6.0	16	6.0	0.534	54.2	LOS F	1.8	13.4	0.95	1.06	1.27	48.7
6	R2	40	6.0	42	6.0	0.534	57.2	LOS F	1.8	13.4	0.95	1.06	1.27	48.6
Appr	oach	83	6.0	87	6.0	0.534	41.3	LOS E	1.8	13.4	0.79	1.01	1.00	52.9
North	nEast:	Shands F	Road N											
7	L2	22	6.0	23	6.0	0.230	7.1	LOSA	0.0	0.0	0.00	0.04	0.00	76.1
8	T1	384	6.0	404	6.0	0.230	0.1	LOSA	0.0	0.0	0.00	0.04	0.00	79.5
9	R2	18	6.0	19	6.0	0.041	13.9	LOS B	0.1	1.1	0.74	0.90	0.74	66.7
Appr	oach	424	6.0	446	6.0	0.230	1.0	NA	0.1	1.1	0.03	0.07	0.03	78.5
North	nWest:	Trents R	oad W											
10	L2	36	6.0	38	6.0	0.161	23.2	LOS C	0.5	3.6	0.82	1.00	0.83	62.6
11	T1	16	6.0	17	6.0	0.195	40.6	LOS E	0.6	4.2	0.92	1.01	0.96	54.2
12	R2	5	6.0	5	6.0	0.195	42.7	LOS E	0.6	4.2	0.92	1.01	0.96	50.6
Appr	oach	57	6.0	60	6.0	0.195	29.8	LOS D	0.6	4.2	0.86	1.00	0.88	58.9
Sout	hWest	Shands	Road S											
1	L2	12	6.0	13	6.0	0.505	7.2	LOSA	0.0	0.0	0.00	0.01	0.00	75.5
2	T1	887	6.0	934	6.0	0.505	0.2	LOSA	0.0	0.0	0.00	0.01	0.00	79.4
3	R2	23	6.0	24	6.0	0.022	8.6	LOSA	0.1	0.7	0.47	0.65	0.47	68.5
Appr	oach	922	6.0	971	6.0	0.505	0.5	NA	0.1	0.7	0.01	0.02	0.01	79.0
All Vehic	cles	1486	6.0	1564	6.0	0.534	4.1	NA	1.8	13.4	0.09	0.13	0.11	75.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

🧓 Site: 101 [Shands Road / Trents Road PM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

Vehi	cle M	ovement	Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEMA FLO\ [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	hEast:	Trents Ro		VO11/11	,,	****			7011					1311//11
4	L2	34	6.0	36	6.0	0.223	31.9	LOS D	0.7	5.0	0.89	1.01	0.96	54.9
5	T1	14	6.0	15	6.0	0.527	107.5	LOS F	1.5	11.3	0.98	1.04	1.19	35.1
6	R2	10	6.0	11	6.0	0.527	122.9	LOS F	1.5	11.3	0.98	1.04	1.19	35.1
Appr	oach	58	6.0	61	6.0	0.527	65.9	LOS F	1.5	11.3	0.93	1.02	1.05	43.7
North	nEast:	Shands R	oad N											
7	L2	55	6.0	58	6.0	0.597	7.4	LOSA	0.0	0.0	0.00	0.03	0.00	75.6
8	T1	1006	6.0	1059	6.0	0.597	0.4	LOSA	0.0	0.0	0.00	0.03	0.00	78.9
9	R2	22	6.0	23	6.0	0.025	9.4	LOSA	0.1	0.7	0.53	0.70	0.53	69.6
Appr	oach	1083	6.0	1140	6.0	0.597	1.0	NA	0.1	0.7	0.01	0.05	0.01	78.5
North	nWest:	Trents Ro	oad W											
10	L2	47	6.0	49	6.0	0.088	13.5	LOS B	0.3	2.2	0.55	0.98	0.55	67.9
11	T1	28	6.0	29	6.0	0.838	174.2	LOS F	3.0	22.3	0.99	1.12	1.68	27.3
12	R2	11	6.0	12	6.0	0.838	170.9	LOS F	3.0	22.3	0.99	1.12	1.68	24.3
Appr	oach	86	6.0	91	6.0	0.838	86.0	LOS F	3.0	22.3	0.75	1.05	1.06	40.1
South	hWest	: Shands I	Road S											
1	L2	10	6.0	11	6.0	0.298	7.1	LOSA	0.0	0.0	0.00	0.01	0.00	75.7
2	T1	517	6.0	544	6.0	0.298	0.1	LOSA	0.0	0.0	0.00	0.01	0.00	79.7
3	R2	46	6.0	48	6.0	0.160	18.9	LOS C	0.5	3.9	0.85	0.95	0.85	61.5
Appr	oach	573	6.0	603	6.0	0.298	1.7	NA	0.5	3.9	0.07	0.09	0.07	77.7
All Vehic	cles	1800	6.0	1895	6.0	0.838	7.4	NA	3.0	22.3	0.09	0.14	0.11	72.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

🧓 Site: 101 [Shands Road / Hamptons Road AM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

Vehi	cle M	ovement	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO' [Total veh/h		Deg. Satn v/c		Level of Service	95% BA QUE [Veh. veh		Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Hamptons Road E						V/C	300		VCII	- ''				KIII/II
4	L2	65	6.0	68	6.0	0.097	11.9	LOS B	0.3	2.5	0.47	0.94	0.47	71.9
5	T1	5	6.0	5	6.0	0.131	26.4	LOS D	0.4	2.9	0.86	1.00	0.86	63.6
6	R2	17	6.0	18	6.0	0.131	28.8	LOS D	0.4	2.9	0.86	1.00	0.86	61.2
Appr	oach	87	6.0	92	6.0	0.131	16.0	LOS C	0.4	2.9	0.57	0.95	0.57	69.5
North	nEast:	Shands R	Road N											
7	L2	20	6.0	21	6.0	0.228	7.1	LOSA	0.0	0.0	0.00	0.03	0.00	76.6
8	T1	382	6.0	402	6.0	0.228	0.1	LOSA	0.0	0.0	0.00	0.03	0.00	79.5
9	R2	23	6.0	24	6.0	0.033	10.8	LOS B	0.1	0.9	0.60	0.77	0.60	67.0
Appr	oach	425	6.0	447	6.0	0.228	1.0	NA	0.1	0.9	0.03	0.07	0.03	78.7
North	nWest:	Hampton	s Road	W										
10	L2	56	6.0	59	6.0	0.147	16.6	LOS C	0.5	3.6	0.69	1.00	0.69	63.2
11	T1	3	6.0	3	6.0	0.035	25.9	LOS D	0.1	0.8	0.85	1.00	0.85	64.1
12	R2	3	6.0	3	6.0	0.035	28.0	LOS D	0.1	8.0	0.85	1.00	0.85	62.5
Appr	oach	62	6.0	65	6.0	0.147	17.6	LOS C	0.5	3.6	0.71	1.00	0.71	63.3
South	hWest	: Shands I	Road S											
1	L2	4	6.0	4	6.0	0.384	7.3	LOSA	0.0	0.0	0.00	0.00	0.00	76.7
2	T1	681	6.0	717	6.0	0.384	0.2	LOSA	0.0	0.0	0.00	0.00	0.00	79.7
3	R2	51	6.0	54	6.0	0.048	8.6	LOSA	0.2	1.5	0.47	0.67	0.47	72.8
Appr	oach	736	6.0	775	6.0	0.384	0.9	NA	0.2	1.5	0.03	0.05	0.03	78.9
All Vehic	cles	1310	6.0	1379	6.0	0.384	2.7	NA	0.5	3.6	0.10	0.16	0.10	77.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

🧓 Site: 101 [Shands Road / Hamptons Road PM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO' [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	nEast:	Hampton	s Road	E										
4 5	L2 T1	89 8	6.0 6.0	94 8	6.0 6.0	0.501 0.436	34.7 86.8	LOS D LOS F	1.8 1.3	13.6 9.3	0.91 0.97	1.07 1.03	1.26 1.13	62.5 44.6
6	R2	15	6.0	16	6.0	0.436	93.8	LOSF	1.3	9.3	0.97	1.03	1.13	41.8
Appr	oach	112	6.0	118	6.0	0.501	46.4	LOS E	1.8	13.6	0.93	1.06	1.23	57.9
North	East:	Shands R	Road N											
7 8	L2 T1	33 961	6.0	35 1012	6.0 6.0	0.564 0.564	7.3 0.3	LOS A	0.0	0.0	0.00	0.02	0.00	76.3 79.2
9 Appr	R2 oach	24 1018	6.0	25 1072	6.0	0.027 0.564	9.3	LOS A NA	0.1	0.8	0.53	0.70	0.53	78.8
North	iWest:	Hampton	s Road	W										
10 11 12	L2 T1 R2	33 12 4	6.0 6.0 6.0	35 13 4	6.0 6.0 6.0	0.062 0.308 0.308	13.4 79.9 91.0	LOS B LOS F LOS F	0.2 0.9 0.9	1.5 6.3 6.3	0.54 0.97 0.97	0.96 1.02 1.02	0.54 1.06 1.06	65.2 46.5 44.1
Appr	oach	49	6.0	52	6.0	0.308	36.0	LOS E	0.9	6.3	0.68	0.98	0.71	55.5
South	nWest:	: Shands I	Road S											
1 2	L2 T1	8 516	6.0 6.0	8 543	6.0 6.0	0.294 0.294	7.2 0.2	LOS A LOS A	0.0 0.0	0.0	0.00 0.00	0.01 0.01	0.00	76.7 79.7
3	R2	85	6.0	89	6.0	0.244	17.8	LOS C	0.9	6.7	0.83	0.96	0.92	68.5
Appr	oach	609	6.0	641	6.0	0.294	2.7	NA	0.9	6.7	0.12	0.14	0.13	77.3
All Vehic	eles	1788	6.0	1882	6.0	0.564	5.2	NA	1.8	13.6	0.12	0.16	0.15	75.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

🧓 Site: 101 [Springs Road / Hamptons Road AM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO' [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Hamptons Road E						V/C	360		Ven	- '''				KIII/II
4	L2	23	6.0	24	6.0	0.028	9.7	LOSA	0.1	0.7	0.36	0.88	0.36	57.0
5	T1	41	6.0	43	6.0	0.093	12.0	LOS B	0.3	2.4	0.54	0.98	0.54	55.4
6	R2	10	6.0	11	6.0	0.093	12.8	LOS B	0.3	2.4	0.54	0.98	0.54	53.2
Appr	oach	74	6.0	78	6.0	0.093	11.4	LOS B	0.3	2.4	0.49	0.94	0.49	55.8
North	nEast:	Springs F	Road N											
7	L2	2	6.0	2	6.0	0.142	5.7	LOSA	0.0	0.0	0.00	0.00	0.00	58.8
8	T1	251	6.0	264	6.0	0.142	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	24	6.0	25	6.0	0.018	6.4	LOSA	0.1	0.6	0.34	0.56	0.34	56.3
Appr	oach	277	6.0	292	6.0	0.142	0.6	NA	0.1	0.6	0.03	0.05	0.03	59.7
North	nWest:	Hampton	s Road	W										
10	L2	31	6.0	33	6.0	0.036	9.5	LOSA	0.1	0.9	0.34	0.88	0.34	55.7
11	T1	39	6.0	41	6.0	0.093	12.0	LOS B	0.3	2.4	0.54	0.98	0.54	55.4
12	R2	12	6.0	13	6.0	0.093	12.8	LOS B	0.3	2.4	0.54	0.98	0.54	56.9
Appr	oach	82	6.0	86	6.0	0.093	11.2	LOS B	0.3	2.4	0.47	0.94	0.47	55.8
South	hWest	: Springs	Road S											
1	L2	8	6.0	8	6.0	0.128	5.8	LOSA	0.0	0.0	0.00	0.02	0.00	59.4
2	T1	219	6.0	231	6.0	0.128	0.2	LOSA	0.0	0.0	0.00	0.02	0.00	59.9
3	R2	40	6.0	42	6.0	0.031	6.5	LOSA	0.1	1.0	0.36	0.58	0.36	57.4
Appr	oach	267	6.0	281	6.0	0.128	1.3	NA	0.1	1.0	0.05	0.10	0.05	59.4
All Vehic	cles	700	6.0	737	6.0	0.142	3.3	NA	0.3	2.4	0.14	0.27	0.14	58.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

🧓 Site: 101 [Springs Road / Hamptons Road PM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEMA FLO\ [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	hEast:	Hampton			/0	V/C	366		Veri	- '''				KIII/II
4	L2	26	6.0	27	6.0	0.032	9.7	LOSA	0.1	0.8	0.36	0.88	0.36	57.0
5	T1	55	6.0	58	6.0	0.162	14.6	LOS B	0.6	4.1	0.67	1.01	0.67	54.6
6	R2	12	6.0	13	6.0	0.162	16.3	LOS C	0.6	4.1	0.67	1.01	0.67	52.1
Appr	oach	93	6.0	98	6.0	0.162	13.5	LOS B	0.6	4.1	0.58	0.97	0.58	55.2
North	nEast:	Springs F	Road N											
7	L2	11	6.0	12	6.0	0.146	5.7	LOSA	0.0	0.0	0.00	0.03	0.00	58.6
8	T1	248	6.0	261	6.0	0.146	0.1	LOSA	0.0	0.0	0.00	0.03	0.00	59.9
9	R2	50	6.0	53	6.0	0.046	7.1	LOSA	0.2	1.4	0.46	0.63	0.46	56.1
Appr	oach	309	6.0	325	6.0	0.146	1.4	NA	0.2	1.4	0.07	0.12	0.07	59.3
North	nWest:	Hampton	s Road	W										
10	L2	28	6.0	29	6.0	0.041	10.7	LOS B	0.1	1.0	0.45	0.90	0.45	55.4
11	T1	89	6.0	94	6.0	0.243	15.2	LOS C	0.9	6.8	0.68	1.02	0.75	54.5
12	R2	13	6.0	14	6.0	0.243	16.5	LOS C	0.9	6.8	0.68	1.02	0.75	56.3
Appr	oach	130	6.0	137	6.0	0.243	14.4	LOS B	0.9	6.8	0.63	1.00	0.68	54.9
South	hWest	: Springs	Road S											
1	L2	15	6.0	16	6.0	0.213	5.9	LOSA	0.0	0.0	0.00	0.02	0.00	59.3
2	T1	364	6.0	383	6.0	0.213	0.3	LOSA	0.0	0.0	0.00	0.02	0.00	59.8
3	R2	35	6.0	37	6.0	0.028	6.5	LOSA	0.1	0.9	0.37	0.58	0.37	57.4
Appr	oach	414	6.0	436	6.0	0.213	1.0	NA	0.1	0.9	0.03	0.07	0.03	59.6
All Vehic	cles	946	6.0	996	6.0	0.243	4.2	NA	0.9	6.8	0.18	0.30	0.19	58.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

Site: 101 [Springs Road / Trents Road AM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total	MES HV]	DEM/ FLO' [Total	WS HV]	Deg. Satn	Delay	Level of Service	QUI [Veh.	ACK OF EUE Dist]	Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
Sout	hEast:	veh/h Trents Ro	%	veh/h	%	v/c	sec		veh	m				km/h
						0.044					0.00		2.22	10.0
4	L2	9	6.0	9	6.0	0.011	9.2	LOSA	0.0	0.3	0.38	0.86	0.38	43.9
5	T1	15	6.0	16	6.0	0.099	12.3	LOS B	0.3	2.5	0.61	1.00	0.61	45.5
6	R2	30	6.0	32	6.0	0.099	13.6	LOS B	0.3	2.5	0.61	1.00	0.61	43.6
Appr	oach	54	6.0	57	6.0	0.099	12.5	LOS B	0.3	2.5	0.57	0.98	0.57	44.3
North	nEast:	Springs R	Road N											
7	L2	5	6.0	5	6.0	0.156	4.7	LOSA	0.0	0.0	0.00	0.01	0.00	49.4
8	T1	272	6.0	286	6.0	0.156	0.1	LOSA	0.0	0.0	0.00	0.01	0.00	49.9
9	R2	36	6.0	38	6.0	0.030	5.7	LOS A	0.1	0.9	0.40	0.56	0.40	48.1
Appr	oach	313	6.0	329	6.0	0.156	8.0	NA	0.1	0.9	0.05	0.07	0.05	49.6
North	nWest:	Trents Ro	oad W											
10	L2	83	6.0	87	6.0	0.107	9.6	LOSA	0.4	2.9	0.41	0.91	0.41	47.6
11	T1	30	6.0	32	6.0	0.071	12.2	LOS B	0.2	1.8	0.56	0.98	0.56	45.8
12	R2	6	6.0	6	6.0	0.071	12.1	LOS B	0.2	1.8	0.56	0.98	0.56	46.5
Appr	oach	119	6.0	125	6.0	0.107	10.3	LOS B	0.4	2.9	0.46	0.93	0.46	47.2
Sout	hWest	: Springs I	Road S											
1	L2	10	6.0	11	6.0	0.172	5.3	LOSA	0.1	0.7	0.04	0.03	0.04	49.6
2	T1	285	6.0	300	6.0	0.172	0.1	LOSA	0.1	0.7	0.04	0.03	0.04	49.8
3														
-	R2	8	6.0	8	6.0	0.172	5.9	LOSA	0.1	0.7	0.04	0.03	0.04	48.8
Appr	oacn	303	6.0	319	6.0	0.172	0.4	NA	0.1	0.7	0.04	0.03	0.04	49.8
All Vehic	cles	789	6.0	831	6.0	0.172	2.9	NA	0.4	2.9	0.14	0.25	0.14	48.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

Site: 101 [Springs Road / Trents Road PM Peak (Site Folder: Existing 2020)]

Site Category: (None) Stop (Two-Way)

Vehi	cle M	ovement	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEMA FLO\ [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	hEast:	Trents Ro		VEII/II	/0	V/C	366		Ven	- '''				KIII/II
4	L2	13	6.0	14	6.0	0.020	10.3	LOS B	0.1	0.5	0.46	0.89	0.46	43.4
5	T1	16	6.0	17	6.0	0.074	17.5	LOS C	0.2	1.8	0.76	1.00	0.76	44.1
6	R2	5	6.0	5	6.0	0.074	20.1	LOS C	0.2	1.8	0.76	1.00	0.76	41.6
Appr	oach	34	6.0	36	6.0	0.074	15.1	LOS C	0.2	1.8	0.65	0.96	0.65	43.6
North	nEast:	Springs R	Road N											
7	L2	17	6.0	18	6.0	0.232	4.8	LOSA	0.0	0.0	0.00	0.02	0.00	49.3
8	T1	394	6.0	415	6.0	0.232	0.2	LOSA	0.0	0.0	0.00	0.02	0.00	49.8
9	R2	66	6.0	69	6.0	0.067	6.7	LOSA	0.3	2.1	0.51	0.66	0.51	48.0
Appr	oach	477	6.0	502	6.0	0.232	1.2	NA	0.3	2.1	0.07	0.11	0.07	49.4
North	nWest:	Trents Ro	oad W											
10	L2	77	6.0	81	6.0	0.129	11.3	LOS B	0.5	3.3	0.52	0.98	0.52	47.3
11	T1	39	6.0	41	6.0	0.171	18.1	LOS C	0.6	4.1	0.77	1.00	0.77	44.1
12	R2	11	6.0	12	6.0	0.171	18.1	LOS C	0.6	4.1	0.77	1.00	0.77	45.1
Appr	oach	127	6.0	134	6.0	0.171	14.0	LOS B	0.6	4.1	0.62	0.99	0.62	46.3
South	hWest	: Springs I	Road S											
1	L2	11	6.0	12	6.0	0.268	5.9	LOSA	0.1	1.0	0.03	0.02	0.03	49.6
2	T1	452	6.0	476	6.0	0.268	0.1	LOSA	0.1	1.0	0.03	0.02	0.03	49.9
3	R2	8	6.0	8	6.0	0.268	7.1	LOSA	0.1	1.0	0.03	0.02	0.03	48.9
Appr	oach	471	6.0	496	6.0	0.268	0.3	NA	0.1	1.0	0.03	0.02	0.03	49.8
All Vehic	cles	1109	6.0	1167	6.0	0.268	2.7	NA	0.6	4.1	0.14	0.20	0.14	49.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: ABLEY TRANSPORTATION CONSULTANTS LIMITED | Licence: PLUS / 1PC | Created: Thursday, 29 October 2020 3:30:19

Project: J:\Urban Estates Ltd (UEL)\UEL-J001 West Prebbleton Private Plan Change\DocCalcs\SIDRA Modelling\Prebbleton PC Models.sip9

USER REPORT FOR SITE

All Movement Classes

Project: Prebbleton PC Models

Template: Movement Summary Report

▼ Site: 101v [Shands Road / Trents Road AM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO¹ [Total veh/h		Deg. Satn v/c		Level of Service	95% BA QUE [Veh. veh		Prop. E Que	ffective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	hEast:	Trents Ro	oad E											
4	L2	36	6.0	38	6.0	0.127	7.5	LOSA	0.5	3.8	0.49	0.74	0.49	68.5
5	T1	19	6.0	20	6.0	0.127	7.9	LOSA	0.5	3.8	0.49	0.74	0.49	71.2
6	R2	51	6.0	54	6.0	0.127	14.0	LOS B	0.5	3.8	0.49	0.74	0.49	70.9
Appr	oach	106	6.0	112	6.0	0.127	10.7	LOS B	0.5	3.8	0.49	0.74	0.49	70.2
North	nEast:	Shands F	Road N											
7	L2	28	6.0	29	6.0	0.134	5.9	LOSA	0.7	5.4	0.21	0.46	0.21	72.4
8	T1	492	6.0	518	6.0	0.237	6.1	LOSA	1.5	10.8	0.20	0.47	0.20	72.7
9	R2	23	6.0	24	6.0	0.237	12.0	LOS B	1.5	10.8	0.20	0.47	0.20	73.2
Appr	oach	543	6.0	572	6.0	0.237	6.4	LOSA	1.5	10.8	0.20	0.47	0.20	72.7
North	nWest:	Trents R	oad W											
10	L2	46	6.0	48	6.0	0.132	11.4	LOS B	0.6	4.5	0.71	0.87	0.71	69.6
11	T1	20	6.0	21	6.0	0.132	11.1	LOS B	0.6	4.5	0.71	0.87	0.71	70.9
12	R2	6	6.0	6	6.0	0.132	17.0	LOS B	0.6	4.5	0.71	0.87	0.71	68.0
Appr	oach	72	6.0	76	6.0	0.132	11.8	LOS B	0.6	4.5	0.71	0.87	0.71	69.8
South	hWest	: Shands	Road S											
1	L2	15	6.0	16	6.0	0.300	6.2	LOSA	1.9	14.3	0.32	0.48	0.32	70.6
2	T1	1135	6.0	1195	6.0	0.530	6.8	LOSA	4.7	34.3	0.36	0.49	0.36	71.9
3	R2	29	6.0	31	6.0	0.530	12.3	LOS B	4.7	34.3	0.38	0.49	0.38	71.4
Appr	oach	1179	6.0	1241	6.0	0.530	7.0	LOSA	4.7	34.3	0.36	0.49	0.36	71.8
All Vehic	cles	1900	6.0	2000	6.0	0.530	7.2	LOSA	4.7	34.3	0.34	0.51	0.34	71.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

▼ Site: 101v [Shands Road / Trents Road PM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO¹ [Total veh/h		Deg. Satn v/c		Level of Service	95% BA QUE [Veh. veh		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	hEast:	Trents Ro	oad E											
4	L2	44	6.0	46	6.0	0.157	12.9	LOS B	8.0	5.6	0.77	0.90	0.77	66.9
5	T1	18	6.0	19	6.0	0.157	12.2	LOS B	0.8	5.6	0.77	0.90	0.77	69.7
6	R2	13	6.0	14	6.0	0.157	18.1	LOS B	0.8	5.6	0.77	0.90	0.77	69.4
Appr	oach	75	6.0	79	6.0	0.157	13.7	LOS B	0.8	5.6	0.77	0.90	0.77	68.1
North	nEast:	Shands F	Road N											
7	L2	70	6.0	74	6.0	0.357	6.3	LOSA	2.4	17.5	0.36	0.51	0.36	71.7
8	T1	1288	6.0	1356	6.0	0.630	7.1	LOSA	6.2	45.5	0.43	0.50	0.43	71.6
9	R2	28	6.0	29	6.0	0.630	12.5	LOS B	6.2	45.5	0.45	0.50	0.45	72.2
Appr	oach	1386	6.0	1459	6.0	0.630	7.2	LOSA	6.2	45.5	0.43	0.50	0.43	71.6
North	nWest:	Trents R	oad W											
10	L2	60	6.0	63	6.0	0.148	8.4	LOSA	0.6	4.5	0.57	0.76	0.57	70.8
11	T1	36	6.0	38	6.0	0.148	8.7	LOS A	0.6	4.5	0.57	0.76	0.57	72.1
12	R2	14	6.0	15	6.0	0.148	14.8	LOS B	0.6	4.5	0.57	0.76	0.57	69.3
Appr	oach	110	6.0	116	6.0	0.148	9.3	LOSA	0.6	4.5	0.57	0.76	0.57	71.0
South	hWest	: Shands	Road S											
1	L2	13	6.0	14	6.0	0.181	5.9	LOSA	1.1	7.8	0.23	0.46	0.23	71.0
2	T1	662	6.0	697	6.0	0.320	6.2	LOSA	2.2	16.4	0.23	0.48	0.23	72.3
3	R2	59	6.0	62	6.0	0.320	12.0	LOS B	2.2	16.4	0.24	0.48	0.24	71.8
Appr	oach	734	6.0	773	6.0	0.320	6.7	LOSA	2.2	16.4	0.23	0.48	0.23	72.3
All Vehic	cles	2305	6.0	2426	6.0	0.630	7.4	LOSA	6.2	45.5	0.38	0.52	0.38	71.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

▼ Site: 101v [Shands Road / Hamptons Road AM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total		DEM/ FLO¹ [Total		Deg. Satn		Level of Service		ACK OF EUE Dist]	Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m -				km/h
South	hEast:	Hampton	s Road	E										
4	L2	83	6.0	87	6.0	0.134	7.6	LOSA	0.5	4.0	0.50	0.72	0.50	72.2
5	T1	6	6.0	6	6.0	0.134	7.9	LOS A	0.5	4.0	0.50	0.72	0.50	74.1
6	R2	22	6.0	23	6.0	0.134	14.0	LOS B	0.5	4.0	0.50	0.72	0.50	73.8
Appr	oach	111	6.0	117	6.0	0.134	8.9	LOSA	0.5	4.0	0.50	0.72	0.50	72.6
North	nEast:	Shands F	Road N											
7	L2	26	6.0	27	6.0	0.137	6.0	LOSA	0.7	5.3	0.23	0.47	0.23	73.9
8	T1	489	6.0	515	6.0	0.242	6.2	LOSA	1.4	10.6	0.23	0.48	0.23	72.5
9	R2	29	6.0	31	6.0	0.242	12.0	LOS B	1.4	10.6	0.23	0.48	0.23	73.1
Appr	oach	544	6.0	573	6.0	0.242	6.5	LOSA	1.4	10.6	0.23	0.48	0.23	72.6
North	nWest:	Hampton	s Road	W										
10	L2	72	6.0	76	6.0	0.121	9.4	LOSA	0.5	3.7	0.62	0.80	0.62	70.8
11	T1	4	6.0	4	6.0	0.121	9.6	LOSA	0.5	3.7	0.62	0.80	0.62	73.7
12	R2	4	6.0	4	6.0	0.121	15.5	LOS B	0.5	3.7	0.62	0.80	0.62	69.3
Appr	oach	80	6.0	84	6.0	0.121	9.7	LOSA	0.5	3.7	0.62	0.80	0.62	70.9
South	hWest	: Shands	Road S											
1	L2	5	6.0	5	6.0	0.230	5.9	LOSA	1.4	10.0	0.22	0.46	0.22	71.0
2	T1	872	6.0	918	6.0	0.406	6.3	LOSA	3.0	21.8	0.24	0.47	0.24	72.4
3	R2	65	6.0	68	6.0	0.406	12.0	LOS B	3.0	21.8	0.24	0.48	0.24	73.8
Appr	oach	942	6.0	992	6.0	0.406	6.7	LOSA	3.0	21.8	0.24	0.47	0.24	72.5
All Vehic	cles	1677	6.0	1765	6.0	0.406	6.9	LOSA	3.0	21.8	0.27	0.51	0.27	72.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

 $\label{eq:hv} \mbox{HV (\%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.}$

▼ Site: 101v [Shands Road / Hamptons Road PM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total		DEM/ FLO¹ [Total		Deg. Satn		Level of Service	95% B <i>A</i> QUE [Veh.		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m -				km/h
Sout	hEast:	Hampton	s Road	E										
4	L2	114	6.0	120	6.0	0.284	12.5	LOS B	1.4	10.4	0.78	0.90	0.78	70.2
5	T1	10	6.0	11	6.0	0.284	11.9	LOS B	1.4	10.4	0.78	0.90	0.78	72.2
6	R2	19	6.0	20	6.0	0.284	17.9	LOS B	1.4	10.4	0.78	0.90	0.78	71.9
Appr	oach	143	6.0	151	6.0	0.284	13.2	LOS B	1.4	10.4	0.78	0.90	0.78	70.6
North	nEast:	Shands R	load N											
7	L2	42	6.0	44	6.0	0.342	6.5	LOSA	2.2	16.1	0.38	0.52	0.38	73.3
8	T1	1230	6.0	1295	6.0	0.603	7.2	LOSA	5.5	40.5	0.44	0.52	0.44	71.5
9	R2	31	6.0	33	6.0	0.603	12.6	LOS B	5.5	40.5	0.47	0.52	0.47	72.1
Appr	oach	1303	6.0	1372	6.0	0.603	7.3	LOSA	5.5	40.5	0.44	0.52	0.44	71.6
North	nWest:	Hampton	s Road	W										
10	L2	42	6.0	44	6.0	0.086	8.4	LOSA	0.3	2.5	0.57	0.74	0.57	71.0
11	T1	15	6.0	16	6.0	0.086	8.8	LOSA	0.3	2.5	0.57	0.74	0.57	73.9
12	R2	5	6.0	5	6.0	0.086	14.9	LOS B	0.3	2.5	0.57	0.74	0.57	69.6
Appr	oach	62	6.0	65	6.0	0.086	9.1	LOSA	0.3	2.5	0.57	0.74	0.57	71.8
South	hWest	: Shands	Road S											
1	L2	10	6.0	11	6.0	0.193	5.9	LOSA	1.1	8.3	0.23	0.46	0.23	71.0
2	T1	660	6.0	695	6.0	0.340	6.2	LOSA	2.4	17.6	0.24	0.49	0.24	72.1
3	R2	109	6.0	115	6.0	0.340	12.0	LOS B	2.4	17.6	0.24	0.50	0.24	73.5
Appr	oach	779	6.0	820	6.0	0.340	7.0	LOSA	2.4	17.6	0.24	0.49	0.24	72.3
All Vehic	cles	2287	6.0	2407	6.0	0.603	7.7	LOSA	5.5	40.5	0.40	0.54	0.40	71.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

▼ Site: 101v [Springs Road / Hamptons Road AM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total		DEM/ FLO		Deg. Satn		Level of Service	95% B <i>A</i> QUE [Veh.		Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South	hEast:	Hampton	s Road	E										
4	L2	29	6.0	31	6.0	0.106	6.4	LOSA	0.6	4.2	0.53	0.62	0.53	57.5
5	T1	52	6.0	55	6.0	0.106	6.6	LOSA	0.6	4.2	0.53	0.62	0.53	57.2
6	R2	13	6.0	14	6.0	0.106	10.6	LOS B	0.6	4.2	0.53	0.62	0.53	55.7
Appr	oach	94	6.0	99	6.0	0.106	7.1	LOSA	0.6	4.2	0.53	0.62	0.53	57.2
North	nEast:	Springs F	Road N											
7	L2	3	6.0	3	6.0	0.303	5.0	LOSA	1.9	14.0	0.36	0.50	0.36	55.6
8	T1	321	6.0	338	6.0	0.303	5.2	LOSA	1.9	14.0	0.36	0.50	0.36	57.9
9	R2	31	6.0	33	6.0	0.303	9.2	LOSA	1.9	14.0	0.36	0.50	0.36	57.1
Appr	oach	355	6.0	374	6.0	0.303	5.6	LOSA	1.9	14.0	0.36	0.50	0.36	57.9
North	nWest:	Hampton	ns Road	W										
10	L2	40	6.0	42	6.0	0.116	6.2	LOSA	0.6	4.6	0.52	0.62	0.52	56.4
11	T1	50	6.0	53	6.0	0.116	6.5	LOSA	0.6	4.6	0.52	0.62	0.52	57.3
12	R2	15	6.0	16	6.0	0.116	10.5	LOS B	0.6	4.6	0.52	0.62	0.52	58.1
Appr	oach	105	6.0	111	6.0	0.116	7.0	LOSA	0.6	4.6	0.52	0.62	0.52	57.2
South	hWest	: Springs	Road S											
1	L2	10	6.0	11	6.0	0.283	4.8	LOSA	1.8	13.2	0.32	0.50	0.32	58.0
2	T1	280	6.0	295	6.0	0.283	5.1	LOSA	1.8	13.2	0.32	0.50	0.32	57.9
3	R2	51	6.0	54	6.0	0.283	9.1	LOSA	1.8	13.2	0.32	0.50	0.32	58.0
Appr	oach	341	6.0	359	6.0	0.283	5.7	LOSA	1.8	13.2	0.32	0.50	0.32	57.9
All Vehic	cles	895	6.0	942	6.0	0.303	5.9	LOSA	1.9	14.0	0.38	0.53	0.38	57.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

 $\label{eq:hv} \mbox{HV (\%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.}$

▼ Site: 101v [Springs Road / Hamptons Road PM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO¹ [Total veh/h		Deg. Satn v/c		Level of Service	95% BA QUE [Veh. veh		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	hEast:	Hampton	s Road	E										
4	L2	33	6.0	35	6.0	0.140	6.7	LOSA	8.0	5.8	0.58	0.65	0.58	57.4
5	T1	70	6.0	74	6.0	0.140	6.9	LOSA	8.0	5.8	0.58	0.65	0.58	57.2
6	R2	15	6.0	16	6.0	0.140	10.9	LOS B	0.8	5.8	0.58	0.65	0.58	55.6
Appr	oach	118	6.0	124	6.0	0.140	7.3	LOSA	8.0	5.8	0.58	0.65	0.58	57.1
North	nEast:	Springs F	Road N											
7	L2	14	6.0	15	6.0	0.368	5.5	LOSA	2.5	18.7	0.49	0.57	0.49	55.2
8	T1	317	6.0	334	6.0	0.368	5.7	LOSA	2.5	18.7	0.49	0.57	0.49	57.7
9	R2	64	6.0	67	6.0	0.368	9.8	LOSA	2.5	18.7	0.49	0.57	0.49	56.8
Appr	oach	395	6.0	416	6.0	0.368	6.4	LOSA	2.5	18.7	0.49	0.57	0.49	57.5
North	nWest:	Hampton	s Road	W										
10	L2	36	6.0	38	6.0	0.225	7.9	LOSA	1.4	10.1	0.69	0.74	0.69	55.9
11	T1	114	6.0	120	6.0	0.225	8.1	LOSA	1.4	10.1	0.69	0.74	0.69	56.9
12	R2	17	6.0	18	6.0	0.225	12.1	LOS B	1.4	10.1	0.69	0.74	0.69	57.8
Appr	oach	167	6.0	176	6.0	0.225	8.5	LOSA	1.4	10.1	0.69	0.74	0.69	56.9
South	hWest:	Springs	Road S											
1	L2	19	6.0	20	6.0	0.464	5.4	LOSA	3.5	25.7	0.48	0.55	0.48	57.9
2	T1	466	6.0	491	6.0	0.464	5.7	LOSA	3.5	25.7	0.48	0.55	0.48	57.7
3	R2	45	6.0	47	6.0	0.464	9.7	LOSA	3.5	25.7	0.48	0.55	0.48	57.8
Appr	oach	530	6.0	558	6.0	0.464	6.0	LOSA	3.5	25.7	0.48	0.55	0.48	57.8
All Vehic	cles	1210	6.0	1274	6.0	0.464	6.6	LOSA	3.5	25.7	0.52	0.59	0.52	57.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

🧓 Site: 101 [Springs Road / Trents Road AM Peak 2030 (Site Folder: Future 2030)]

New Site Site Category: (None) Stop (Two-Way)

Vehi	cle M	ovement	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEMA FLO\ [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	hEast:	Trents Ro		VEII/II	/0	V/C	366		Veri	- '''				KIII/II
4	L2	12	6.0	13	6.0	0.017	9.9	LOSA	0.1	0.4	0.43	0.88	0.43	43.6
5	T1	19	6.0	20	6.0	0.170	14.9	LOS B	0.6	4.2	0.73	1.00	0.73	44.6
6	R2	38	6.0	40	6.0	0.170	17.3	LOS C	0.6	4.2	0.73	1.00	0.73	42.2
Appr	oach	69	6.0	73	6.0	0.170	15.4	LOS C	0.6	4.2	0.68	0.98	0.68	43.3
North	nEast:	Springs R	load N											
7	L2	6	6.0	6	6.0	0.200	4.7	LOSA	0.0	0.0	0.00	0.01	0.00	49.4
8	T1	348	6.0	366	6.0	0.200	0.1	LOSA	0.0	0.0	0.00	0.01	0.00	49.9
9	R2	46	6.0	48	6.0	0.042	6.2	LOSA	0.2	1.3	0.46	0.61	0.46	48.1
Appr	oach	400	6.0	421	6.0	0.200	0.9	NA	0.2	1.3	0.05	0.08	0.05	49.6
North	nWest:	Trents Ro	oad W											
10	L2	106	6.0	112	6.0	0.154	10.4	LOS B	0.6	4.2	0.48	0.95	0.48	47.5
11	T1	38	6.0	40	6.0	0.119	14.7	LOS B	0.4	3.0	0.68	1.01	0.68	45.1
12	R2	8	6.0	8	6.0	0.119	14.9	LOS B	0.4	3.0	0.68	1.01	0.68	45.9
Appr	oach	152	6.0	160	6.0	0.154	11.7	LOS B	0.6	4.2	0.54	0.97	0.54	46.9
South	hWest	: Springs I	Road S											
1	L2	13	6.0	14	6.0	0.222	5.6	LOSA	0.1	1.1	0.04	0.03	0.04	49.6
2	T1	365	6.0	384	6.0	0.222	0.1	LOSA	0.1	1.1	0.04	0.03	0.04	49.8
3	R2	10	6.0	11	6.0	0.222	6.5	LOSA	0.1	1.1	0.04	0.03	0.04	48.8
Appr	oach	388	6.0	408	6.0	0.222	0.4	NA	0.1	1.1	0.04	0.03	0.04	49.8
All Vehic	cles	1009	6.0	1062	6.0	0.222	3.3	NA	0.6	4.2	0.17	0.26	0.17	48.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

🧓 Site: 101 [Springs Road / Trents Road PM Peak 2030 (Site Folder: Future 2030)]

New Site Site Category: (None) Stop (Two-Way)

Vehi	cle M	ovement	Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEMA FLO\ [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	hEast:	Trents Ro		VEII/II	70	V/C	366		Veri	- '''				KIII/II
4	L2	17	6.0	18	6.0	0.031	11.6	LOS B	0.1	0.8	0.53	0.93	0.53	42.8
5	T1	20	6.0	21	6.0	0.156	25.8	LOS D	0.5	3.5	0.87	1.00	0.87	41.6
6	R2	6	6.0	6	6.0	0.156	32.0	LOS D	0.5	3.5	0.87	1.00	0.87	38.4
Appr	oach	43	6.0	45	6.0	0.156	21.0	LOS C	0.5	3.5	0.73	0.97	0.73	41.5
North	nEast:	Springs R	oad N											
7	L2	22	6.0	23	6.0	0.298	4.8	LOSA	0.0	0.0	0.00	0.02	0.00	49.3
8	T1	504	6.0	531	6.0	0.298	0.2	LOSA	0.0	0.0	0.00	0.02	0.00	49.8
9	R2	84	6.0	88	6.0	0.104	7.8	LOSA	0.4	3.1	0.58	0.76	0.58	47.7
Appr	oach	610	6.0	642	6.0	0.298	1.4	NA	0.4	3.1	0.08	0.12	0.08	49.3
North	nWest:	Trents Ro	oad W											
10	L2	99	6.0	104	6.0	0.209	13.4	LOS B	0.7	5.5	0.63	1.01	0.64	46.8
11	T1	50	6.0	53	6.0	0.362	30.4	LOS D	1.3	9.3	0.89	1.06	1.09	40.8
12	R2	14	6.0	15	6.0	0.362	30.9	LOS D	1.3	9.3	0.89	1.06	1.09	42.4
Appr	oach	163	6.0	172	6.0	0.362	20.1	LOS C	1.3	9.3	0.73	1.03	0.82	44.8
South	hWest	: Springs I	Road S											
1	L2	14	6.0	15	6.0	0.345	6.8	LOSA	0.3	1.9	0.04	0.02	0.05	49.6
2	T1	579	6.0	609	6.0	0.345	0.1	LOSA	0.3	1.9	0.04	0.02	0.05	49.8
3	R2	10	6.0	11	6.0	0.345	8.7	LOSA	0.3	1.9	0.04	0.02	0.05	48.8
Appr	oach	603	6.0	635	6.0	0.345	0.4	NA	0.3	1.9	0.04	0.02	0.05	49.8
All Vehic	cles	1419	6.0	1494	6.0	0.362	3.7	NA	1.3	9.3	0.16	0.21	0.17	48.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

USER REPORT FOR SITE

All Movement Classes

Project: Prebbleton PC Models

Template: Movement Summary Report

♥ Site: 101v [Shands Road / Trents Road AM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO¹ [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	hEast:	Trents Ro	oad E											
4	L2	55	6.0	58	6.0	0.352	8.3	LOSA	1.7	12.5	0.59	0.83	0.59	67.0
5	T1	19	6.0	20	6.0	0.352	8.6	LOSA	1.7	12.5	0.59	0.83	0.59	69.8
6	R2	212	6.0	223	6.0	0.352	14.8	LOS B	1.7	12.5	0.59	0.83	0.59	69.5
Appr	oach	286	6.0	301	6.0	0.352	13.1	LOS B	1.7	12.5	0.59	0.83	0.59	69.1
North	nEast:	Shands F	Road N											
7	L2	98	6.0	103	6.0	0.159	5.9	LOSA	0.9	6.7	0.24	0.49	0.24	72.4
8	T1	515	6.0	542	6.0	0.280	6.2	LOSA	1.9	13.8	0.24	0.47	0.24	72.5
9	R2	23	6.0	24	6.0	0.280	12.0	LOS B	1.9	13.8	0.24	0.47	0.24	73.1
Appr	oach	636	6.0	669	6.0	0.280	6.4	LOSA	1.9	13.8	0.24	0.47	0.24	72.5
North	nWest:	Trents R	oad W											
10	L2	46	6.0	48	6.0	0.183	14.7	LOS B	0.9	7.0	0.83	0.92	0.83	68.0
11	T1	20	6.0	21	6.0	0.183	13.5	LOS B	0.9	7.0	0.83	0.92	0.83	69.2
12	R2	6	6.0	6	6.0	0.183	19.5	LOS B	0.9	7.0	0.83	0.92	0.83	66.2
Appr	oach	72	6.0	76	6.0	0.183	14.8	LOS B	0.9	7.0	0.83	0.92	0.83	68.2
South	hWest	: Shands	Road S											
1	L2	15	6.0	16	6.0	0.372	7.4	LOSA	2.5	18.7	0.57	0.62	0.57	69.3
2	T1	1189	6.0	1252	6.0	0.656	8.4	LOSA	6.7	49.1	0.67	0.63	0.67	70.3
3	R2	38	6.0	40	6.0	0.656	13.7	LOS B	6.7	49.1	0.71	0.64	0.72	69.7
Appr	oach	1242	6.0	1307	6.0	0.656	8.6	LOSA	6.7	49.1	0.67	0.63	0.67	70.3
All Vehic	cles	2236	6.0	2354	6.0	0.656	8.7	LOSA	6.7	49.1	0.54	0.62	0.54	70.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

▼ Site: 101v [Shands Road / Trents Road PM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

Vehi	icle M	ovement	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO [Total veh/h		Deg. Satn v/c		Level of Service	95% BA QUE [Veh. veh		Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Sout	hEast:	Trents Ro												
4	L2	53	6.0	56	6.0	0.389	17.2	LOS B	2.3	17.0	0.87	0.99	1.01	62.9
5	T1	18	6.0	19	6.0	0.389	16.0	LOS B	2.3	17.0	0.87	0.99	1.01	66.0
6	R2	87	6.0	92	6.0	0.389	22.0	LOS C	2.3	17.0	0.87	0.99	1.01	65.7
Appr	oach	158	6.0	166	6.0	0.389	19.7	LOS B	2.3	17.0	0.87	0.99	1.01	64.9
North	nEast:	Shands R	load N											
7	L2	215	6.0	226	6.0	0.413	6.5	LOSA	2.9	21.3	0.41	0.54	0.41	71.7
8	T1	1336	6.0	1406	6.0	0.729	7.5	LOSA	8.5	62.3	0.54	0.53	0.54	71.0
9	R2	28	6.0	29	6.0	0.729	12.9	LOS B	8.5	62.3	0.57	0.53	0.57	71.7
Appr	oach	1579	6.0	1662	6.0	0.729	7.4	LOSA	8.5	62.3	0.52	0.53	0.52	71.1
North	nWest:	Trents Ro	oad W											
10	L2	60	6.0	63	6.0	0.164	9.0	LOSA	0.7	5.3	0.63	0.80	0.63	70.4
11	T1	36	6.0	38	6.0	0.164	9.3	LOSA	0.7	5.3	0.63	0.80	0.63	71.7
12	R2	14	6.0	15	6.0	0.164	15.4	LOS B	0.7	5.3	0.63	0.80	0.63	68.9
Appr	oach	110	6.0	116	6.0	0.164	9.9	LOSA	0.7	5.3	0.63	0.80	0.63	70.7
Sout	hWest:	: Shands I	Road S											
1	L2	13	6.0	14	6.0	0.211	6.4	LOSA	1.3	9.7	0.38	0.51	0.38	70.3
2	T1	687	6.0	723	6.0	0.372	6.7	LOSA	2.9	21.2	0.40	0.52	0.40	71.4
3	R2	77	6.0	81	6.0	0.372	12.4	LOS B	2.9	21.2	0.41	0.53	0.41	70.9
Appr	oach	777	6.0	818	6.0	0.372	7.2	LOSA	2.9	21.2	0.40	0.52	0.40	71.4
All Vehic	cles	2624	6.0	2762	6.0	0.729	8.2	LOSA	8.5	62.3	0.51	0.57	0.52	70.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

 $\label{eq:hv} \mbox{HV (\%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.}$

♥ Site: 101v [Shands Road / Hamptons Road AM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO [Total veh/h		Deg. Satn v/c		Level of Service	95% BA QUI [Veh. veh	ACK OF EUE Dist] m	Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Hamptons Road E														
4 5	L2 T1	141 6	6.0	148 6	6.0	0.273 0.273	8.0 8.3	LOS A	1.2	9.1 9.1	0.56 0.56	0.78 0.78	0.56 0.56	71.5 73.4
6 Appro	R2 pach	75 222	6.0	79 234	6.0	0.273 0.273	10.1	LOS B	1.2	9.1	0.56 0.56	0.78 0.78	0.56 0.56	73.2 72.2
North	East:	Shands F	Road N											
7 8	L2 T1	49 508	6.0 6.0	52 535	6.0 6.0	0.152 0.268	6.1 6.4	LOS A	0.8 1.7	6.2 12.6	0.29	0.49	0.29	73.7 72.2
9 Appro	R2 bach	29 586	6.0	31 617	6.0	0.268 0.268	6.6	LOS B	1.7	12.6 12.6	0.29	0.49	0.29	72.8 72.4
North	West:	Hamptor	ns Road	W										
10 11 12	L2 T1 R2	72 4 4	6.0 6.0 6.0	76 4 4	6.0 6.0 6.0	0.132 0.132 0.132	10.0 10.1 16.1	LOS A LOS B	0.6 0.6 0.6	4.3 4.3 4.3	0.67 0.67 0.67	0.84 0.84 0.84	0.67 0.67 0.67	70.4 73.5 68.9
Appro	oach	80	6.0	84	6.0	0.132	10.3	LOS B	0.6	4.3	0.67	0.84	0.67	70.5
South	nWest	: Shands	Road S											
1 2 3	L2 T1 R2	5 880 90	6.0 6.0 6.0	5 926 95	6.0 6.0 6.0	0.254 0.448 0.448	6.3 6.7 12.3	LOS A LOS B	1.6 3.6 3.6	11.5 26.2 26.2	0.34 0.36 0.38	0.49 0.51 0.52	0.34 0.36 0.38	70.5 71.6 73.2
Appro		975	6.0	1026	6.0	0.448	7.2	LOSA	3.6	26.2	0.37	0.51	0.37	71.8
All Vehic	eles	1863	6.0	1961	6.0	0.448	7.5	LOSA	3.6	26.2	0.38	0.55	0.38	72.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

♥ Site: 101v [Shands Road / Hamptons Road PM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

Vehi	cle M	ovement	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO\ [Total veh/h		Deg. Satn v/c		Level of Service	95% BA QUE [Veh. veh		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	SouthEast: Hamptons Road E													
4	L2	142	6.0	149	6.0	0.425	14.8	LOS B	2.5	18.4	0.84	0.98	1.00	68.6
5	T1	10	6.0	11	6.0	0.425	14.0	LOS B	2.5	18.4	0.84	0.98	1.00	70.7
6	R2	44	6.0	46	6.0	0.425	20.0	LOS C	2.5	18.4	0.84	0.98	1.00	70.5
Appr	oach	196	6.0	206	6.0	0.425	15.9	LOS B	2.5	18.4	0.84	0.98	1.00	69.2
North	nEast:	Shands R	load N											
7	L2	90	6.0	95	6.0	0.376	6.9	LOSA	2.5	18.4	0.47	0.57	0.47	73.1
8	T1	1239	6.0	1304	6.0	0.664	7.7	LOSA	6.6	48.3	0.57	0.58	0.57	70.8
9	R2	31	6.0	33	6.0	0.664	13.1	LOS B	6.6	48.3	0.60	0.58	0.60	71.5
Appr	oach	1360	6.0	1432	6.0	0.664	7.8	LOSA	6.6	48.3	0.56	0.57	0.56	71.1
North	nWest:	Hampton	s Road	W										
10	L2	42	6.0	44	6.0	0.092	8.9	LOSA	0.4	2.8	0.61	0.77	0.61	70.8
11	T1	15	6.0	16	6.0	0.092	9.2	LOSA	0.4	2.8	0.61	0.77	0.61	73.7
12	R2	5	6.0	5	6.0	0.092	15.4	LOS B	0.4	2.8	0.61	0.77	0.61	69.3
Appr	oach	62	6.0	65	6.0	0.092	9.5	LOSA	0.4	2.8	0.61	0.77	0.61	71.5
South	hWest	Shands I	Road S											
1	L2	10	6.0	11	6.0	0.218	6.1	LOSA	1.3	9.9	0.30	0.47	0.30	70.7
2	T1	679	6.0	715	6.0	0.384	6.4	LOSA	3.0	21.8	0.31	0.51	0.31	71.6
3	R2	164	6.0	173	6.0	0.384	12.1	LOS B	3.0	21.8	0.32	0.53	0.32	72.9
Appr	oach	853	6.0	898	6.0	0.384	7.5	LOSA	3.0	21.8	0.31	0.51	0.31	71.9
All Vehic	cles	2471	6.0	2601	6.0	0.664	8.4	LOSA	6.6	48.3	0.50	0.59	0.51	71.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

♥ Site: 101v [Springs Road / Hamptons Road AM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total		DEM/ FLO¹ [Total		Deg. Satn		Level of Service	95% B <i>A</i> QUE [Veh.		Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m m		rate		km/h
SouthEast: Hamptons Road E				E										
4	L2	29	6.0	31	6.0	0.117	7.1	LOSA	0.7	4.8	0.60	0.67	0.60	57.3
5	T1	52	6.0	55	6.0	0.117	7.3	LOSA	0.7	4.8	0.60	0.67	0.60	57.1
6	R2	13	6.0	14	6.0	0.117	11.3	LOS B	0.7	4.8	0.60	0.67	0.60	55.5
Appr	oach	94	6.0	99	6.0	0.117	7.8	LOSA	0.7	4.8	0.60	0.67	0.60	57.0
North	nEast:	Springs F	Road N											
7	L2	3	6.0	3	6.0	0.361	5.5	LOSA	2.4	17.8	0.47	0.56	0.47	55.3
8	T1	341	6.0	359	6.0	0.361	5.7	LOSA	2.4	17.8	0.47	0.56	0.47	57.7
9	R2	47	6.0	49	6.0	0.361	9.7	LOSA	2.4	17.8	0.47	0.56	0.47	56.8
Appr	oach	391	6.0	412	6.0	0.361	6.2	LOSA	2.4	17.8	0.47	0.56	0.47	57.6
North	nWest:	Hampton	s Road	W										
10	L2	76	6.0	80	6.0	0.224	6.5	LOSA	1.3	9.5	0.57	0.69	0.57	56.0
11	T1	50	6.0	53	6.0	0.224	6.8	LOSA	1.3	9.5	0.57	0.69	0.57	57.0
12	R2	73	6.0	77	6.0	0.224	10.8	LOS B	1.3	9.5	0.57	0.69	0.57	57.9
Appr	oach	199	6.0	209	6.0	0.224	8.2	LOSA	1.3	9.5	0.57	0.69	0.57	57.1
South	hWest	: Springs	Road S											
1	L2	35	6.0	37	6.0	0.318	5.0	LOSA	2.1	15.2	0.36	0.51	0.36	58.0
2	T1	289	6.0	304	6.0	0.318	5.2	LOSA	2.1	15.2	0.36	0.51	0.36	57.9
3	R2	51	6.0	54	6.0	0.318	9.2	LOSA	2.1	15.2	0.36	0.51	0.36	58.0
Appr	oach	375	6.0	395	6.0	0.318	5.7	LOSA	2.1	15.2	0.36	0.51	0.36	57.9
All Vehic	cles	1059	6.0	1115	6.0	0.361	6.5	LOSA	2.4	17.8	0.46	0.58	0.46	57.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

♥ Site: 101v [Springs Road / Hamptons Road PM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

Vehi	cle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total		DEMAND FLOWS [Total HV]		Deg. Satn		Level of Service	95% B <i>A</i> QUE [Veh.		Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South	nEast:	Hampton	s Road	E										
4	L2	33	6.0	35	6.0	0.151	7.2	LOSA	0.9	6.5	0.64	0.69	0.64	57.3
5	T1	70	6.0	74	6.0	0.151	7.5	LOSA	0.9	6.5	0.64	0.69	0.64	57.0
6	R2	15	6.0	16	6.0	0.151	11.5	LOS B	0.9	6.5	0.64	0.69	0.64	55.4
Appro	oach	118	6.0	124	6.0	0.151	7.9	LOSA	0.9	6.5	0.64	0.69	0.64	57.0
North	East:	Springs F	Road N											
7	L2	14	6.0	15	6.0	0.425	5.8	LOSA	3.1	23.0	0.55	0.61	0.55	54.9
8	T1	327	6.0	344	6.0	0.425	6.0	LOSA	3.1	23.0	0.55	0.61	0.55	57.5
9	R2	101	6.0	106	6.0	0.425	10.1	LOS B	3.1	23.0	0.55	0.61	0.55	56.6
Appro	oach	442	6.0	465	6.0	0.425	7.0	LOSA	3.1	23.0	0.55	0.61	0.55	57.3
North	West:	Hamptor	ns Road	W										
10	L2	55	6.0	58	6.0	0.298	8.2	LOSA	1.9	14.2	0.74	0.79	0.74	55.7
11	T1	114	6.0	120	6.0	0.298	8.5	LOSA	1.9	14.2	0.74	0.79	0.74	56.6
12	R2	45	6.0	47	6.0	0.298	12.5	LOS B	1.9	14.2	0.74	0.79	0.74	57.7
Appro	oach	214	6.0	225	6.0	0.298	9.2	LOSA	1.9	14.2	0.74	0.79	0.74	56.7
South	nWest:	Springs	Road S											
1	L2	74	6.0	78	6.0	0.549	5.9	LOSA	4.5	32.8	0.58	0.60	0.58	57.8
2	T1	484	6.0	509	6.0	0.549	6.2	LOSA	4.5	32.8	0.58	0.60	0.58	57.6
3	R2	45	6.0	47	6.0	0.549	10.2	LOS B	4.5	32.8	0.58	0.60	0.58	57.7
Appro	oach	603	6.0	635	6.0	0.549	6.4	LOSA	4.5	32.8	0.58	0.60	0.58	57.7
All Vehic	les	1377	6.0	1449	6.0	0.549	7.2	LOSA	4.5	32.8	0.60	0.64	0.60	57.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

🧓 Site: 101 [Springs Road / Trents Road AM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site Site Category: (None) Stop (Two-Way)

Vehi	cle M	ovement	Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEMA FLO\ [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Trents Road E					70	VIC	300		VCII	- '''				KIII/II
4	L2	12	6.0	13	6.0	0.017	10.0	LOS B	0.1	0.4	0.44	0.88	0.44	43.6
5	T1	19	6.0	20	6.0	0.229	17.7	LOS C	8.0	5.8	0.81	1.03	0.89	43.2
6	R2	38	6.0	40	6.0	0.229	23.3	LOS C	8.0	5.8	0.81	1.03	0.89	40.4
Appr	oach	69	6.0	73	6.0	0.229	19.4	LOS C	0.8	5.8	0.75	1.00	0.81	41.8
North	nEast:	Springs R	oad N											
7	L2	6	6.0	6	6.0	0.209	4.7	LOSA	0.0	0.0	0.00	0.01	0.00	49.4
8	T1	364	6.0	383	6.0	0.209	0.1	LOSA	0.0	0.0	0.00	0.01	0.00	49.9
9	R2	94	6.0	99	6.0	0.091	6.5	LOSA	0.4	2.9	0.50	0.66	0.50	48.0
Appr	oach	464	6.0	488	6.0	0.209	1.5	NA	0.4	2.9	0.10	0.14	0.10	49.3
North	nWest:	Trents Ro	oad W											
10	L2	216	6.0	227	6.0	0.332	11.7	LOS B	1.5	11.3	0.56	1.04	0.65	47.2
11	T1	38	6.0	40	6.0	0.202	17.1	LOS C	0.7	5.1	0.75	1.01	0.79	44.4
12	R2	27	6.0	28	6.0	0.202	17.4	LOS C	0.7	5.1	0.75	1.01	0.79	45.3
Appr	oach	281	6.0	296	6.0	0.332	13.0	LOS B	1.5	11.3	0.60	1.03	0.68	46.7
South	hWest	: Springs I	Road S											
1	L2	21	6.0	22	6.0	0.247	5.4	LOSA	0.2	1.2	0.04	0.04	0.04	49.6
2	T1	401	6.0	422	6.0	0.247	0.1	LOSA	0.2	1.2	0.04	0.04	0.04	49.8
3	R2	10	6.0	11	6.0	0.247	6.7	LOSA	0.2	1.2	0.04	0.04	0.04	48.7
Appr	oach	432	6.0	455	6.0	0.247	0.5	NA	0.2	1.2	0.04	0.04	0.04	49.8
All Vehic	cles	1246	6.0	1312	6.0	0.332	4.7	NA	1.5	11.3	0.23	0.35	0.25	48.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

Site: 101 [Springs Road / Trents Road PM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site Site Category: (None) Stop (Two-Way)

Vehi	cle M	ovement	Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO\ [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Trents Road E														
4 5 6	L2 T1 R2	17 20 6	6.0 6.0 6.0	18 21 6	6.0 6.0 6.0	0.033 0.227 0.227	12.1 36.1 48.4	LOS B LOS E LOS E	0.1 0.7 0.7	0.8 5.1 5.1	0.55 0.92 0.92	0.94 1.02 1.02	0.55 0.98 0.98	42.5 38.8 34.8
Appr	oach	43	6.0	45	6.0	0.227	28.3	LOS D	0.7	5.1	0.77	0.99	0.81	39.1
North	nEast:	Springs R	oad N											
7 8 9	L2 T1 R2	22 541 196	6.0 6.0 6.0	23 569 206	6.0 6.0 6.0	0.319 0.319 0.259	4.8 0.2 8.7	LOS A LOS A	0.0 0.0 1.2	0.0 0.0 8.6	0.00 0.00 0.64	0.02 0.02 0.85	0.00 0.00 0.68	49.3 49.8 47.5
Appr	oach	759	6.0	799	6.0	0.319	2.6	NA	1.2	8.6	0.16	0.24	0.18	48.9
North	nWest:	Trents Ro	oad W											
10 11 12	L2 T1 R2	156 50 23	6.0 6.0 6.0	164 53 24	6.0 6.0 6.0	0.342 0.572 0.572	15.1 47.6 48.4	LOS C LOS E LOS E	1.5 2.1 2.1	10.7 15.6 15.6	0.68 0.95 0.95	1.06 1.11 1.11	0.86 1.35 1.35	46.5 36.8 38.9
Appr	oach	229	6.0	241	6.0	0.572	25.5	LOS D	2.1	15.6	0.77	1.08	1.02	43.8
South	hWest	: Springs I	Road S											
1 2 3	L2 T1 R2	32 598 10	6.0 6.0 6.0	34 629 11	6.0 6.0 6.0	0.366 0.366 0.366	6.2 0.2 9.3	LOS A LOS A	0.3 0.3 0.3	2.3 2.3 2.3	0.05 0.05 0.05	0.03 0.03 0.03	0.06 0.06 0.06	49.6 49.8 48.7
Appr	oach	640	6.0	674	6.0	0.366	0.6	NA	0.3	2.3	0.05	0.03	0.06	49.7
All Vehic	cles	1671	6.0	1759	6.0	0.572	5.6	NA	2.1	15.6	0.22	0.29	0.26	48.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

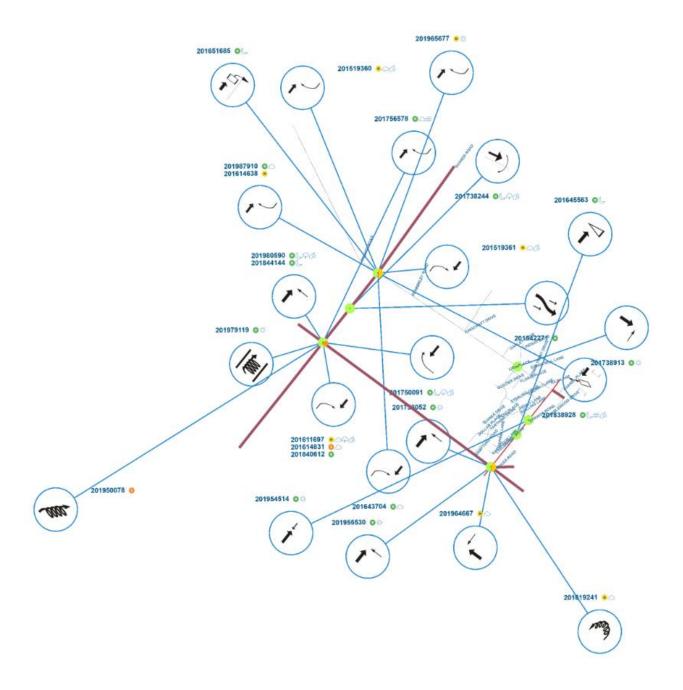


Appendix D CAS extract - Collision Diagram Exports



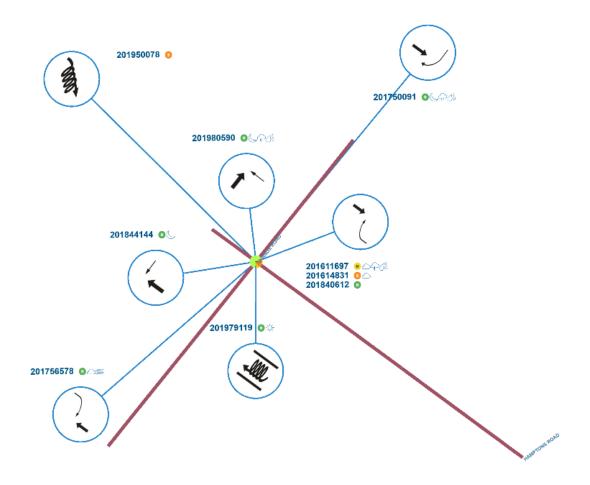


D1 - All crashes



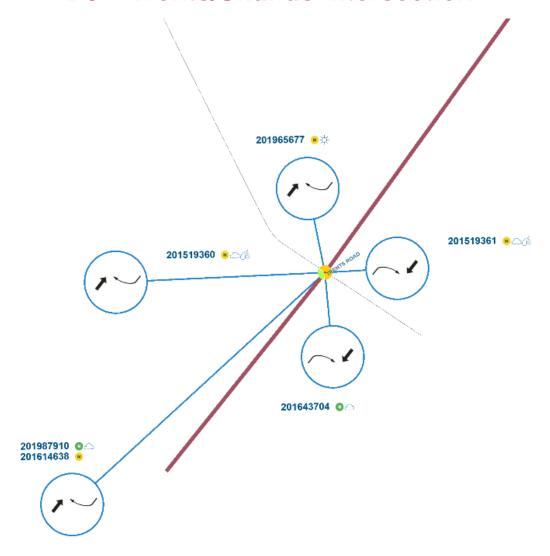


D2 – Hamptons/Shands Intersection



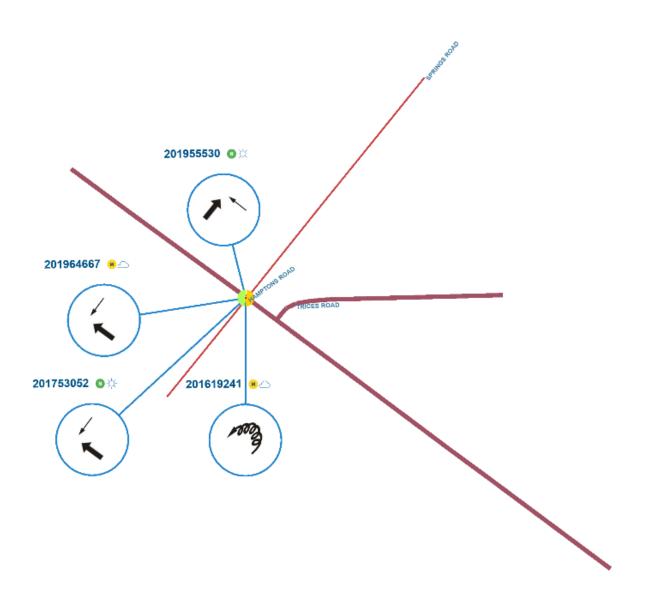


D3 – Trents/Shands Intersection





D4 – Hamptons/Springs Intersection





D5 – Trents/Springs Intersection

No crashes at this intersection.

T +64 9 486 0898 (Akld) T +64 3 377 4703 (Chch) E office@abley.com Auckland Level 1, 70 Shortland Street PO Box 613 Auckland 1140 New Zealand Christchurch Level 1, 137 Victoria Street PO Box 36446 Christchurch 8146 New Zealand www.abley.com



T +64 9 486 0898 (Akld) T +64 3 377 4703 (Chch) E office@abley.com

Auckland Level 1, 70 Shortland Street PO Box 911336 Auckland 1142 New Zealand Christchurch Level 1, 137 Victoria Street PO Box 25350 Christchurch 8144 New Zealand

www.abley.com





ATTACHMENT E Maahanui Kurataiao Ltd Report



Date: 10/02/2021

To Urban Holdings Limited, Suburban Estates Limited and Cairnbrae Developments Limited

ATTN: Brad Wilson c/o Alice Burnett - Alice.Burnett@dls.co.nz

West Prebbleton Private Plan Change

Report

Manawhenua Statement

Ngāi Tahu are tangata whenua of the Canterbury region, and hold ancestral and contemporary relationships with Canterbury. The contemporary structure of Ngāi Tahu is set down through the Te Rūnanga o Ngāi Tahu Act 1996 (TRoNT Act) and, through this structure and this Act, sets the requirements for recognition of tangata whenua in Canterbury.

The following Runanga hold manawhenua over the project's location, as it is within their takiwa:

- Te Ngāi Tūāhuriri Rūnanga
- Te Taumutu Rūnanga

The natural resources – water (waterways, waipuna (springs), groundwater, wetlands); mahinga kai; indigenous flora and fauna; cultural landscapes and land - are taonga to manawhenua and they have concerns for activities potentially adversely affecting these taonga. These taonga are integral to the cultural identity of ngā rūnanga manawhenua and they have a kaitiaki responsibility to protect them. The policies for protection of taonga that are of high cultural significance to ngā rūnanga manawhenua are articulated in the Mahaanui Iwi Management Plan (IMP).

Assessment of Proposal

- Urban Holdings Limited, Suburban Estates Limited and Cairnbrae Developments Limited are undertaking a private plan change for the rezoning of the south western area of Prebbleton on Trents Road, Shands Rd, Hamptons Road and the Sterling Park development.
- It is proposed to rezone 67.5 hectares of Rural Inner Plains land to Living Z, which is comprised of 13 parcels of land.
- The development will provide approximately 820 residential allotments based on the Living Z density rules. These will be a mix of medium and low-density allotments with the rest of the land to be used for the roading network and public open spaces/reserves.
- The total volume of earthworks for the plan change will approximately be between 50,000m³

 100,000m³.



- The application does not state any specifics on existing vegetation or planting at the end of works.
- There are no NZAA Māori sites in the area.
- Halswell River is approximately 3.5km away from the proposed area.

Stormwater

- The development will be designed around the retention of existing stormwater flow patterns across the site.
- Primary stormwater from the site will be discharged to ground via soakholes on individual sites.
- Secondary flow will run through the site via swales along the road and reserve networks and discharged to soak holes within the site.

Wastewater

- All sites will be serviced by gravity sewer. Sewage will be piped to the existing Council Pump Station on Springs Road at the Meadow Mushrooms site and then through to The Pines sewage treatment ponds at Rolleston.
- The eastern end of the ODP area is marginally higher than the Pump Station on Springs Road resulting in the need to pump from the area. Alternatively, it may be possible to pump directly from the site directly to the pipe from in Hamptons Road that is taking sewage to the Pines Treatment Plant.
- Due to the flat gradient of the site it will be necessary to have at least two pump stations. It is anticipated that these would both be full pump stations rather than having one pump and one lift station.

Contaminated land

- A site investigation was undertaken in which confirmed that HAIL activities have occurred in some particular areas of the site in the past.
- The application stated that contaminants such as lead, arsenic, copper, zinc and cadmium were found in soil samples taken. All these contaminants exceeded the guideline criteria for Residential land use.
- The application states that ENGEO have recommended a remedial strategy be developed to manage the contaminated land.
- The applicant has not provided a remediation plan with the application.

Evaluation in relation to Mahaanui lwi Management Plan (MIMP)

The matters that are relevant to this particular proposal have been identified as:



- **P4.1** To work with local authorities to ensure a consistent approach to the identification and consideration of Ngāi Tahu interests in subdivision and development activities, including:
 - (a) Encouraging developers to engage with Papatipu Rūnanga in the early stages of development planning to identify potential cultural issues; including the preparation of Cultural Impact Assessment reports;
 - (b) Ensuring engagement with Papatipu Rūnanga at the Plan Change stage, where plan changes are required to enable subdivision;
 - (c) Requiring that resource consent applications assess actual and potential effects on tangata whenua values and associations;
 - (d) Ensuring that effects on tāngata whenua values are avoided, remedied or mitigated using culturally appropriate methods;
 - (e) Ensuring that subdivision consents are applied for and evaluated alongside associated land use and discharge consents; and
 - (f) Requiring that 'add ons' to existing subdivisions are assessed against the policies in this section.
- **P4.2** To support the use of the following methods to facilitate engagement with Papatipu Rūnanga where a subdivision, land use or development activity may have actual or potential adverse effects on cultural values and interests:
 - (a) Site visit and consultative hui;
 - (b) Cultural Impact Assessment (CIA) reports; and
 - (c) Tāngata Whenua Advisory Groups.
- **P4.3** To base tāngata whenua assessments and advice for subdivision and residential land development proposals on a series of principles and guidelines associated with key issues of importance concerning such activities, as per Ngāi Tahu subdivision and development guidelines (see next page).
- **P6.5** To encourage the design of stormwater management systems in urban and semi urban environments to provide for multiple uses: for example, stormwater management infrastructure as part of an open space network that provides for recreation, habitat and customary use values.



Conclusion

The above policies from the Mahaanui Iwi Management Plan provide a framework for assessing the potential adverse effects of the proposed activity on cultural values and provide guidance on how these effects can best be avoided, mitigated and/or remedied.

The proposal was brought to the Te Ngāi Tūāhuriri Rūnanga kaitiaki representatives at a hui on Friday 29th January 2021. Various recommendations were made and are listed below.

Recommendations

Recommendation 1

The applicant should incorporate the recommendations from the Ngai Tahu Subdivision Development Guidelines in the development, particularly with regards to stormwater controls and indigenous plantings. These guidelines have been attached at the end of this document.

Recommendation 2

All erosion and sediment control measures installed should be constructed, inspected and maintained in accordance with ECan's Erosion and Sediment Control Toolbox for Canterbury.

Recommendation 3

Future subdivision should incorporate best practice onsite stormwater management controls to mitigate the effects of development and allow for stormwater infiltration.

- Hardstand areas should be directed to detention ponds and swales to reduce runoff from site and allow for infiltration.
- Stormwater discharge from roads and carparks should not be directed to waterways.

Recommendation 4

It is recommended that an Accidental Discovery Protocol (consistent with appendix 3 of the Mahaanui lwi Management Plan 2013) be followed for any earthworks. This is to avoid any adverse effects on cultural values, as outlined by the above policies.

Recommendation 5

The remediation of contaminated sites to minimise the risk of contaminant-laden stormwater entering waterbodies.



Recommendation 6

Indigenous planting is considered a critical mitigation measure for the large-scale development. This should be done with locally sourced vegetation.

Mahaanui Kurataiao and its staff are available to discuss this report further or assist in direct engagement with rūnanga if desired.

Report Prepared by:

Sapphire Wairau

Environmental Advisor

Peer Reviewed By:

Jason Eden

Environmental Advisor | Team Leader