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### **Executive Summary**

As part of the Selwyn District Plan review, it is proposed to lift deferrals on approximately 29ha of deferred residential land on the western edge of Leeston. Based on the mix of Living 1 and Living 2 zoning (under the operative District Plan), approximately 82 residential lots could be developed in the area. These zones are proposed as part of the District Plan review to become Low density residential and Large lot residential zones respectively, but the likely yield will not change.

Under the operative District Plan, the zones have been deferred until stormwater issues are resolved and an Outline Development Plan (ODP) has been developed.

We understand from Selwyn District Council (SDC) that plans are well advanced to address the stormwater issues, such that they are likely to be resolved by the time that the proposed District Plan is made operative, and an ODP is being developed. The purpose of this report is to provide recommendations on transport provisions of the ODP. The deferred zonings confirm that the areas have already been identified as being appropriate for residential development. Accordingly, the focus of this assessment is on the recommended ODP provisions and improvements to the transport network that are expected to be required to support development rather than assessing wider traffic effects. It has still been necessary to consider potential traffic generation of the deferred zones to ensure a full understanding of how the zones will integrate with and impact the transport network.

From a transportation perspective, it is considered important that the ODP includes a primary local road between High Street and Leeston Dunsandel Road. The following are other recommended additions to the ODP:

- A primary local road loop through the Low density residential area;
- A possible minor local road connection to Spring Place or at least a pedestrian/cyclist connection;
- A pedestrian/cyclist connection from the northern part of the study area to the stormwater detention reserve to the north;
- Possible future roading connections to adjacent land; and
- A possible direct pedestrian connection to Ellesmere College.

At the subdivision stage, it is expected SDC will require developers to carry out the following frontage road upgrades:

- Pedestrian provision along the High Street frontage, including crossings near the intersection and possibly at the ends of the frontage to connect to existing pedestrian provision;
- Pedestrian provision along the Leeston Dunsandel Road frontages, including crossings near the intersections and at the eastern end of the frontage; and
- It will need to be confirmed at that stage whether any road widening is required however the existing carriageway formations may be appropriate for the Large lot residential zone development proposed.

A speed limit change on Leeston Dunsandel Road will need to be considered through separate SDC processes.

The only wider area upgrades recommended relate to pedestrian provision. It is recommended developers of the land in the study area are required to carry out the following works:

- A footpath connection along the northern side of High Street, between Spring Place and Market Street. Possible improvements to pedestrian provision at the Spring Place intersection would be considered as part of this work; and
- An extension of the footpath on the southern side of Leeston Dunsandel Road along the Ellesmere College frontage, if not already constructed as part of subdivision works on the opposite side of the road.

In addition to these works, it is recommended SDC consider planning to make improvements for pedestrians crossing Market Street, including near High Street and Mountain View Place. It is considered the existing pedestrian crossing demand generated by the two schools means developers in the study area should not be wholly responsible for these improvements, but study area developer contributions could be sought by SDC to partially fund the works.

Longer term, SDC may need to consider intersection forms along High Street, including Market Street and Cunningham Street, however it is considered the low traffic generation as a result of development of the study area would not warrant changes to these.

Based on the assessment provided, and allowing for the above recommendations, it is considered that from a transportation perspective the deferred status of the study area can be lifted.

## Selwyn District Council

Leeston Deferred Residential Rezoning Integrated Transport Assessment

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### 1. Introduction

As part of the current Selwyn District Plan review, the Selwyn District Council (SDC) are seeking to lift the deferrals on approximately 29ha of deferred residential zoned land in Leeston. As shown in **Figure 1**, the deferred residential zones are on the western edge of Leeston, indicated by the 'L1 Def' and 'L2 Def' labels. These labels indicate deferred Living 1 and Living 2 zonings respectively.

The residential zoning was deferred until stormwater issues could be resolved and an outline development plan (ODP) was prepared. An ODP is required to ensure the zones achieve good design outcomes, including connectivity for all modes of travel. Currently, there are no existing ODPs within Leeston.

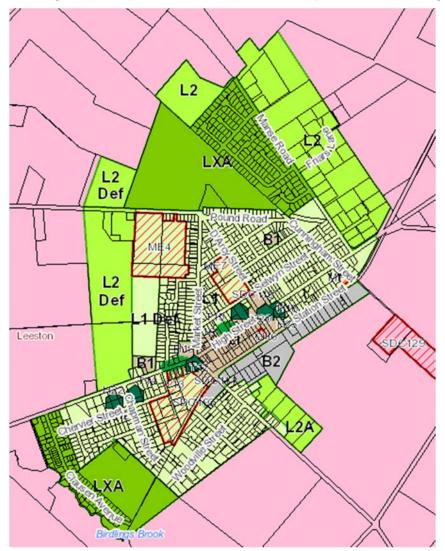


Figure 1: Selwyn District Plan Leeston Zoning-Source: Canterbury Maps

The deferred zonings confirm that the areas have already been identified as appropriate for residential development. Accordingly, this Integrated Transport Assessment is focussed on the provisions of the ODP required to guide future development, rather than transport effects of future residential development. There is still a need to consider potential future traffic generation of the zones, in confirming that new intersection locations are appropriate and whether any upgrades to the existing road network may be required in the future.

#### This report includes:

A description of the existing transport environment surrounding the deferred zones, including descriptions
of keys roads and intersections and a review of the crash history in the area;

- A description of any future changes in the surrounding area that are relevant;
- A summary of the deferred zones and their potential lot yields;
- A traffic generation estimate for the deferred zones;
- Discussion on the proposed ODP, focussed on connectivity to frontage roads and adjacent land uses; and
- Discussion on infrastructure upgrades that may be required initially with development in the zones or in the future.

As part of the District Plan review, the 'Living 1' and 'Living 2' zone types are proposed to be replaced by 'Low density' and 'Large lot' residential zones respectively. Throughout this report, for consistency, only the proposed zone names are used. Also, the deferred residential zones subject to this assessment are referred to collectively as the 'study area'.

### 2. Existing Environment

#### 2.1 Road Network

**Figure 2** shows the outline of the study area in the context of the Leeston road hierarchy as defined by the operative Selwyn District Plan. It also highlights the schools in the area; Ellesmere College and Leeston Primary School, and the town centre area.

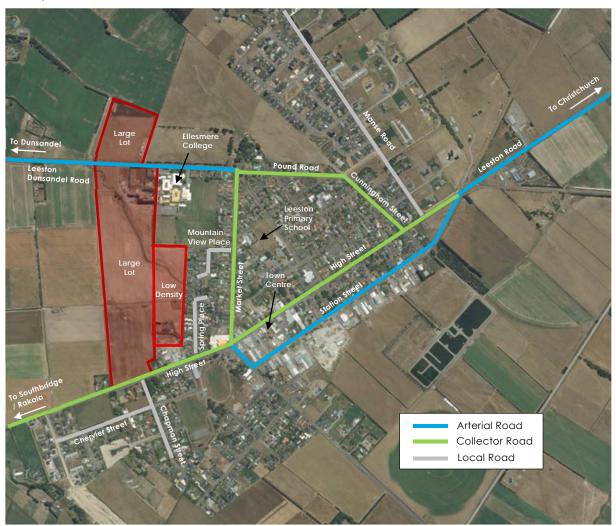


Figure 2: Study Area Location and Leeston Road Hierarchy

Leeston Road is the arterial road which connects Leeston towards Christchurch and other destinations to the north/east. Leeston Road continues into Leeston as High Street, a collector road which is the main street through the town centre, continuing to the south-west towards Southbridge. Station Street is

classified as an arterial road and it acts as a heavy traffic bypass of the town centre. Leeston Dunsandel Road is the other arterial road to/from Leeston and runs from the north-western corner of the town to Dunsandel. Market Street, Pound Road and Cunningham Street are collector roads which provide connections between Leeston Dunsandel Road and High Street.

As shown in Figure 2, the study area is to the west of the town, with frontages to High Street and Leeston Dunsandel Road. In the vicinity of the study area, both Leeston Dunsandel Road and High Street have speed limit thresholds transitioning from rural open road speed to urban speed.

Spring Place, which is adjacent to the east of the study area, is a local road cul-de-sac.

The following table describes the characteristics of the surrounding roads relevant to this assessment. Photographs of these roads are included in Appendix A.

Table 2-1: Road Characteristics

Road	Traffic Volume	Speed Limit	Formation	Pedestrian Provision
Leeston Dunsandel Road (Study Area Frontage)	800vpd (2014 Count)	100km/h for most of frontage, 50km/h at eastern end	Rural formation (Photograph 7 in Appendix A)	None
High Street (Study Area Frontage)	4,000vpd (2017 Count)	50km/h	Rural formation on study area frontage, urban formation on southern side (Photograph 2 in Appendix A)	Footpath on southern side only.
Spring Place	200vpd (Estimate)	50km/h	Urban formation, initial section from High Street with grass berms within kerb lines (Photographs 4 and 5 in Appendix A)	Footpath on eastern side only. Connection through reserve to Mountain View Place
Mountain View Place	200vpd (Estimate)	50km/h	Urban formation (Photograph 8 in Appendix A)	Footpath on northern/western side only. Connection through reserve to Spring Place
Market Street	1,200vpd (2017 Count)	50km/h	Urban formation	Footpaths on both sides
Pound Road	400vpd (2017 Count)	50km/h	Semi-urban formation- kerb on northern side only	Footpath on northern side only
Cunningham Street	650vpd (2014 Count)	50km/h	Urban formation	Footpaths on both sides of the road
Chapman Street	600vpd (2018 Count)	50km/h	Urban formation, initial section from High Street with grass berms within kerb lines	Footpaths on both sides of the road in initial length from High Street

Table 2-2 contains descriptions of the key intersections for this assessment.

Table 2-2: Key Intersections

Road	Form	Priority Leg(s)	Formation
High Street / Chapman Street	T-intersection, GIVE WAY control	High Street	Basic formation (Photograph 2)
High Street / Spring Place	T-intersection, uncontrolled	High Street	Basic formation (Photograph 5)
High Street / Market Street	Crossroad, STOP controls	High Street	Basic formation, wide intersection to accommodate large rural vehicle manoeuvring. (Photograph 3)
High Street / Cunningham Street	Crossroad, STOP controls	High Street	Basic formation
Leeston Dunsandel Road / Market Street / Pound Road	Unconventional T- intersection, STOP control	Leeston Dunsandel Road / Market Street	Pound Road meets the priority route on the outside of a tight bend. Splitter island on side road.

### 2.2 Crash History

The NZTA Crash Analysis System (CAS) has been used to review crash records in Leeston for the full five-year period of 2014-2018. Also, any crashes reported in 2019 have been reviewed. **Figure 3** is an extract from CAS highlighting crash locations. The 2s indicate locations where two crashes have occurred, with the colours of the circles indicating the severity of the crashes.

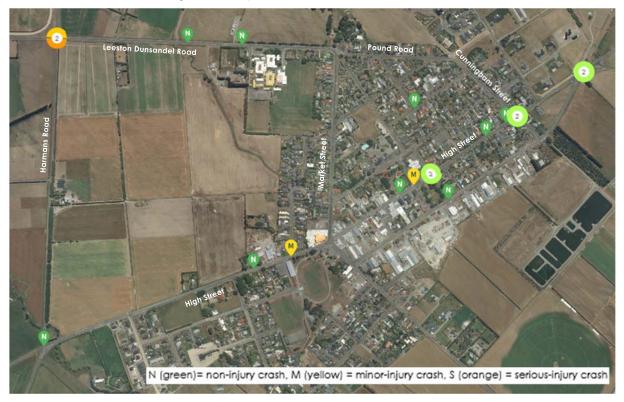


Figure 3: Leeston Crashes 2014-2019

Two non-injury crashes have been reported along the section of Leeston Dunsandel Road fronting the study area. One involved a driver losing control in icy conditions when performing a U-turn and the other occurred when a car crashed into a cow. No crashes have been reported along the High Street study area frontage. One non-injury rear end crash occurred at the tractor yard, to the east of the study area on High Street, and one minor injury crash occurred at the Spring Place intersection, when a driver turning right into Spring Place failed to give-way to an eastbound vehicle.

No crashes have been reported at the Market Street / High Street intersection or the Market Street / Leeston Dunsandel Road intersection, suggesting those intersections are operating safely.

The majority of the other crashes reported occurred along High Street. Two non-injury crashes have been reported at the High Street / Cunningham Street crossroad intersection. One involved a driver failing to give way on Cunningham Street and one involved a crash with a vehicle waiting to turn right from High Street.

One serious crash has been reported at the Leeston Dunsandel Road / Harmans Road crossroad intersection to the west of the study area, resulting from a driver not giving way on Harmans Road.

The crashes that have been reported around Leeston were mostly minor and there are no specific locations causing safety concerns based on the crash history.

#### 2.3 Public Transport

A trial bus service (87 Leeston – City) is being run by Metro between Leeston and Christchurch. One bus runs from Leeston to Christchurch in the morning, leaving at 7am and one bus runs from Christchurch to Leeston in the evening, arriving at 5:50pm. **Figure 4** shows the bus route through Leeston, which starts at a bus stop on Chervier Street, approximately 300m from the High Street study area frontage. The route then passes the study area on High Street.



Figure 4: Service 87 Bus Route in Leeston

### 3. Future Changes

### 3.1 Leeston Development

There are several residential zoned areas in Leeston which have capacity for further development. The main undeveloped area is the LXA zone to the north of the town (visible in Figure 1), which provides for development with an average lot size not less than 650m<sup>2</sup>. This zone borders the northern part (Large Lot) of the study area. Resource consent for subdivision of the LXA zone was granted in 2006, but this has yet to be given effect to. An application to SDC in 2018 for an extension of time is still be determined.

### 3.2 Transport Network Changes

No Leeston transport infrastructure upgrades were identified in the Selwyn Long Term Plan 2018-2028. The Long Term Plan indicated that funding has been approved for a trial public transport service to Darfield and Leeston areas. This trial started earlier in 2019, and is currently operating as described in Section 2.3 above.

### 4. Study Area Lot Yield

The potential lot yield of the study area is summarised below in Table 4-1. The study area has been split into three areas; the Low density residential zoned area and the Large lot residential zoned areas either side of Leeston Dunsandel Road.

Table 4-1: Potential Lot Yields for Study Area

Study Area	Area	Likely Lot Yield (based on proposed zoning and Selwyn Capacity for Growth Model)
Low density residential	5.3ha	40
Large lot residential- South of Leeston Dunsandel Road	18.9ha	34
Large lot residential- North of Leeston Dunsandel Road	4.6ha	8
Total	28.8ha	82

The likely lot yields shown above are not the maximum potential yields based on the lot size requirements included in the proposed District Plan, but rather are modified yields based on the outputs of the Selwyn Capacity for Growth Model (SCGM) provided by SDC. This model provides a 'more realistic' picture of land development for Selwyn based on previous development patterns within the district.

### Traffic Generation

A traffic generation rate of 6 vehicle movements per day (vpd) per household has been used for this assessment. This is lower than the 9-10vpd per household rate commonly used in cities and takes into account the rural location of Leeston, which increases the likelihood of residents to make linked trips e.g. visiting the supermarket and the petrol station on their way home from work in Christchurch. This traffic generation rate has been used and accepted previously in assessments in the Selwyn District, including for Plan Change applications in Darfield and West Melton.

Based on this rate, the potential 82 lots could generate approximately 500 vpd. This traffic generation will be distributed onto the surrounding road network, with destinations both in the Leeston township and external to Leeston e.g. Southbridge, Dunsandel or Christchurch.

The majority of external trips would be expected to be towards Lincoln, Rolleston and Christchurch along Leeston Road (via High Street with some also via either Market Street or Pound Road/Cunningham Street).

Smaller numbers of external trips will be made along Leeston Dunsandel Road, towards Dunsandel, and High Street, towards Southbridge and Rakaia.

## 6. Outline Development Plan

An ODP is being developed for the study area in Leeston. The key transportation-related recommendations for the ODP are described below.

### 6.1 Road Connectivity

#### 6.1.1 Southern Study Area

The part of the study area south of Leeston Dunsandel Road should include a north-south primary local road linking between and connecting to High Street and Leeston Dunsandel Road. From a transport and connectivity perspective this will be important for achieving an efficient and legible road network and it will assist in distributing traffic onto the existing main roads. There is some flexibility achievable in the alignment of the road because it will cross land parcels at right angles.

A primary local loop road through the Low density residential part of the study area is also recommended to provide convenient access to the denser part of the study area.

Secondary local roads within this part of the study area are not critical from a transport perspective and it is considered roading layouts will be able to be developed at the time of subdivision.

A minor road connection is recommended between the study area and Spring Place providing additional internal integration with existing residential areas, particularly for pedestrians and cyclists. It would also

assist with providing a more efficient route for existing residents of Spring Place through to Leeston Dunsandel Road for travel to and from the west. It is understood the connection will be achievable via an existing vacant lot at 18 Spring Place.

There is rural land to the west of the study area, with a 900m long boundary between High Street and Leeston Dunsandel Road. To future proof for any potential change in zoning in the future, it is recommended that the ODP includes two indicative future connections across this boundary.

#### 6.1.2 Northern Study Area

The part of the study area north of Leeston Dunsandel Road borders the existing LXA zone to the east and rural land to the north and west. Based on the subdivision plan for the LXA zone, it appears that the northern part of the study area will not be able to rely solely on access from that zone. Regardless, it is considered preferable that the northern part of the study area is provided direct access from Leeston Dunsandel Road for efficiency.

The northern part of the study area is small and would only accommodate approximately eight lots. Eight lots could be served by either a right of way or a minor road. Accordingly, it is not considered critical that a primary local road connection is provided from Leeston Dunsandel Road, through this part of the study area and potentially into the neighbouring residential zone.

However, it is noted that providing connectivity to adjacent land is typically an aim of planning objectives and policies. Providing indicative future connections to the adjacent residential land and one or both of the rural boundaries could be considered in the development of the ODP. Achieving connectivity would need to be considered against the small number of lots achievable in this part of the study area and the land requirements of roads.

#### 6.1.3 External Intersections

The following text, from the Selwyn District Council Engineering Code of Practice, outlines that T-intersections and roundabout controlled four-way intersections are appropriate intersection forms in residential areas.

Within new residential areas, appropriate intersection types include:

- Priority or roundabout l controlled T or Y-intersections (3-way), depending on the balance of traffic flows and classification of the approach roads. All approach legs to Y junctions should be separated by 120 degrees and T junctions by 90, 90 and 180 degrees.
- Four-way intersections at grade generally should be roundabout controlled due to their high crash risk. Local roads should not intersect with the main road network as cross roads and should only form cross junctions with themselves where necessary. Where unavoidable and a reasonable volume of traffic across the busier road is anticipated, offset the quieter roads as a right – left stagger, to minimise the risk of crashes.

Crossroad intersections on the main road network are generally not desirable because they are inherently less safe than T-intersections due to having more potentially conflicting vehicle movements.

It is considered roundabouts would not be warranted on High Street or Leeston Dunsandel Road, due to low side road crossing demands. Accordingly, it is recommended the new intersections on High Street and Leeston Dunsandel Road are located to avoid crossroad intersections and formed as 90-degree T-intersections.

The following table is from the Proposed Selwyn District Plan and sets out minimum permitted intersection separations, based on the speed limit of the main road.

Posted legal speed limit (km/hr)	Road type	Distance (m)
100	All	800
90	All	248
80	All	214
70	All	181
60	All	151
50	State Highways, Arterials and Collector Roads	123

Figure 5: Proposed Selwyn District Plan Intersection Separation Requirements

It is unlikely the 123m separation will be achievable between the High Street / Chapman Street T-intersection and the new study area intersection on High Street, due to boundary constraints. The Selwyn Engineering Code of Practice states that right-left staggers are preferred to left-right staggers when the minimum intersection separation distance cannot be achieved. That is because right-left staggers avoid overlapping right turn movements and reduce the number of potential vehicle conflicts. However, there is very limited space for the study area intersection on High Street to be located to the east of Chapman Street.

Both Chapman Street and the new road into the study area will carry low traffic volumes and it is considered a minimum 60m separation from Chapman Street to the west will be far enough for the two intersections to operate safely. The 60m separation will allow for back to back right turn lanes to be marked between the two intersections on High Street, if future traffic volumes on that road warrant it.

Ideally, new intersections on Leeston Dunsandel Road would be separated by 151m to meet the District Plan requirement for a 60km/h speed limit (possible future speed limit). However, it is acknowledged that this separation may not be possible due to practicalities around lot locations/sizing and the presence of the creek south of Leeston Dunsandel Road.

If a road is proposed into the northern part of the study area that could connect to future residential development outside of the study area, it is recommended that the new intersections on Leeston Dunsandel Road provide a right-left stagger and are separated by as far as possible. To provide a right-left stagger, the northern study area intersection should be to the east of the southern study area intersection.

If the northern part of the study area was to be served by a right of way or minor local road cul-de-sac (serving only the study area), it is considered it would be acceptable for it to be located directly opposite the road into the southern part of the study area, given the very low traffic volumes it would carry.

The new study area intersections will all accommodate low turning traffic volumes, estimated to be in the order of 100-300vpd. Other key Leeston intersections along High Street, e.g. Cunningham Street, are formed to basic standards without right turn bays. It is expected the study area intersections, with their low forecast turning traffic volumes, would be formed to similar standards initially. The intersections could be upgraded in the future if through volumes increase on High Street and/or Leeston Dunsandel Road.

#### 6.1.4 Internal Study Area Roading Layout Comments

Based on the SDC Engineering Code of Practice, depending on traffic volumes, even local road crossroad intersections within the study area may need to be considered for roundabout controls at the subdivision stage.

It should be reiterated that side roads should meet main roads at intersections as close to perpendicular as possible.

Primary roads indicated on the ODP should have minimum curve radii of 80m, consistent with the SDC Engineering Code of Practice requirement for through streets.

### 6.2 Pedestrian Connectivity

Generally, pedestrian connectivity to/from the study area would be along new roads, connecting to pedestrian infrastructure on the frontage roads.

It is recommended that the ODP indicates a possible pedestrian connection directly from the study area to Ellesmere College. This would allow convenient access for students from the study area, reducing their need to walk on the busier roads, but would need to be agreed with the school at the time of subdivision.

A pedestrian/cyclist connection is recommended from the northern study area through the stormwater detention reserve to the north, which it is understood will continue into the adjacent ODP area.

There is an existing pedestrian connection through a reserve between Spring Place and Mountain View Lane. This will provide a pedestrian access option from the Low density residential part of the study area through to Ellesmere College, as well as Market Street and the primary school.

Further details of the pedestrian network would be considered through subdivision design processes.

### 6.3 Cycling

It is considered no specific cycling connections are required on the ODP. All roads within the study area would carry low traffic volumes and have urban speed limits and accordingly would be suitable for cyclists

to share with cars. Off-road recreational cycle routes could be provided within any reserves identified on the ODP. Cyclist provision could be considered further in subdivision design.

### 7. Infrastructure Upgrades

#### 7.1 Frontage Roads

There will be an expectation that frontage roads are upgraded to an appropriate form at the time of subdivision. The two study area frontage roads are discussed further below.

#### 7.1.1 High Street Frontage

High Street along the southern frontage of the study area has an urban formation along its southern side, reflecting the denser Living 1 zoning on that side of the road. The rural formation along the northern side may remain appropriate for the lower density Large lot residential zone within the study area.

The speed limit is 50km/h along this section of High Street which would remain appropriate.

It is understood SDC will require a footpath to be provided along the study area frontage at the time of subdivision. Means of crossing near the new intersection on High Street should be provided for any pedestrians crossing to the church, on the southern side of High Street, or towards the bus stop on Chervier Street. Crossings to the existing footpath on the southern side of High Street at each end of the study area frontage should also be considered at the subdivision design stage.

#### 7.1.2 Leeston Dunsandel Road Frontage

The rural arterial road formation of Leeston Dunsandel Road may remain appropriate for the lower density Large lot residential zone frontages.

However, the 100km/h speed limit along the study area frontages should be reduced to allow for safe property access and safe intersections. It is considered a 60km/h speed limit would be appropriate along the study area frontages and the existing 50km/h urban speed limit to the east should be kept in place for the safety of the school frontage. Alternatively, the 50km/h speed limit could be extended to the west of the study area frontages. Such changes would be considered through separate SDC processes, and would usually be considered further at the time of subdivision.

It is understood footpaths will be required by SDC along the study area frontages for pedestrians walking to town and particularly to the schools. It will need to be ensured that pedestrians can safely cross to/from the northern side of Leeston Dunsandel Road, including near the new intersections and at the eastern end of the study area (particularly if the adjacent frontage has not been developed).

#### 7.1.3 Spring Place

While the study area does not have a direct frontage to Spring Place, there is a vacant lot which could provide an access into the study area. This link would provide the benefit of added local network connectivity and resilience.

Based on the geometry of Spring Place, it is considered it could be an attractive travel route towards the town centre and the east for only a small number of lots within the Low density residential zone. It is recommended the subdivision layout and the design for the road connection to Spring Place include measures (through road layout or specific road design) to discourage use as a through route for the wider subdivision. Regardless, if the Spring Place connection is an attractive route towards the east for 20 lots, it is estimated there could be an additional 100 vehicle movements per day on Spring Place. This is a very small increase in traffic volumes which would have no effect on the efficient or safe operation of Spring Place. There could be a small connectivity benefit for residents on Spring Place travelling to the west along Leeston Dunsandel Road.

Spring Place only has a footpath on its eastern side. The design of the Spring Place connection will need to include pedestrian crossing provision, connecting to that footpath. It may be necessary to improve pedestrian provision at the High Street intersection. The improved pedestrian provision could tie into a new footpath along the northern side of High Street, as recommended earlier.

The initial 130m length of Spring Place, from High Street, has a sealed carriageway wide enough for two-way traffic and grass berms which are used for parking. Further into Spring Place, the carriageway is widened to allow for kerbside parking. The existing carriageway formation is wide enough to

accommodate the existing low traffic volumes and potential future traffic volumes with a minor connection into the study area.

### 7.2 Wider Network Upgrades

#### 7.2.1 Roading Upgrades

Traffic volume increases across the road network, as a result of the lifting of the deferred status in respect of the study area, will be low. It is considered any possible future changes to the wider road network discussed below will be subject to consideration through separate processes, such as the Long Term Plan. Due to the low impact of the removal of the deferred status on the wider transport network, the following assessment is for information only, rather than providing an expectation of specific requirements as the study area is developed.

It has been estimated that the likely lot yield of the study area could generate approximately 500vpd onto the surrounding road network, generally split between High Street and Leeston Dunsandel Road. Many of these movements would be expected to be through the middle of the town along High Street, slightly increasing the through volumes at several intersections, including the Market Street and Cunningham Street crossroad intersections. Some of the additional traffic would be expected to use the Cunningham Street / Pound Road route to the northern parts of the study area.

The Cunningham Street intersection on High Street would already be used by people travelling to and from the central/northern parts of Leeston. Based on daily traffic counts, High Street, in the vicinity of Cunningham Street, is estimated to carry approximately 400vph (two-way) during peak hours and Cunningham Street, north of High Street, is estimated to carry approximately 80vph (two-way). Due to the layout of this part of Leeston, it is expected that most traffic northbound on Cunningham Street would have turned right in from High Street. Based on these traffic volumes and the warrants for turn treatments on major roads at unsignalised intersections from the Austroads Guide to Traffic Management Part 6 Intersections, Interchanges and Crossings, it is considered marginal whether a right turn bay would be currently warranted.

High Street in the vicinity of Cunningham Street currently has a narrow carriageway and there is no right turn bay or similar at the intersection. Only two non-injury crashes have been reported at the intersection; one of which involved a rear end crash with a vehicle waiting to turn right into Cunningham Street. It is considered the small extra traffic generation from the study area would not warrant changes to this intersection layout, or any other intersection layouts along High Street. However, SDC may need to consider the intersection treatments along the whole High Street corridor if traffic volumes continue to increase. It is noted that a right turn bay has been provided at the Manse Road intersection, further east on High Street, which serves a growing residential area.

#### 7.2.2 Pedestrian Upgrades

Currently, there is no footpath on the northern side of High Street between the study area and Market Street (Appendix A, Photograph 1). It is recommended that a footpath is provided by the study area developer(s) along the northern side of High Street to Market Street, so that people with destinations north of High Street e.g. the primary school, do not have to cross High Street twice. It is noted such a footpath would run along the long Case Agricultural frontage, west of Spring Place, and cross the Fonterra Farm Source store driveway, west of Market Street. Improvements to pedestrian provision at the Spring Place intersection, including the High Street crossing, could be considered as part of these works.

The existing footpath on the southern side of Leeston Dunsandel Road terminates at the easternmost vehicle entrance to Ellesmere College. This should be extended across the balance of the college frontage (Appendix A, Photograph 6) to connect to the study area frontage further west. It is noted that the undeveloped land opposite the school is already zoned for residential development and it may or may not be developed with an upgraded frontage before there is development in the adjacent study area. If the footpath has not been extended along the school frontage when the study area development connects to Leeston Dunsandel Road, it is considered the study area developer(s) should provide the footpath connection.

Market Street is a relatively wide road and there is pedestrian crossing demand generated by the two schools. Development in the study area would increase crossing demand on Market Street, particularly close to High Street and near Mountain View Place. It is recommended pedestrian crossing facilities e.g. refuge islands and/or kerb build outs be provided in these locations to shorten crossing distances and improve pedestrian crossing levels of service. It is recommended SDC consider improving the pedestrian crossing provision and study area developer contributions could be sought to partially fund the work.

### 8. Conclusion

Transport recommendations have been made for the development of the ODP for the study area in Leeston.

It is considered the connections to the surrounding road network will be able to be appropriately located and will be able to be designed to an appropriate form at the subdivision stage.

As part of subdivision, upgrades will be required to the frontage roads, to bring them up to an appropriate standard for a residential frontage. An important part of those upgrades will be pedestrian provision, and the speed limit on Leeston Dunsandel Road will need to be reviewed through separate SDC processes.

Improvements to the wider pedestrian provision, including along High Street, Leeston Dunsandel Road and Market Street have been recommended.

The deferred zones will generate low additional traffic volumes and it is considered no wider changes to the road network would be required as a result of the lifting of the deferrals.



# Appendix A Road Photographs



Photograph 1: High Street, East of Study Area, Looking East



Photograph 2: High Street, Study Area Frontage, Looking West, Chapman Street on Left



Photograph 3: High Street / Market Street Intersection, from South-Eastern Corner, Looking West



Photograph 4: Spring Place, Opposite Vacant 18 Spring Place Lot, Looking South



**Photograph 5: High Street / Spring Place Intersection** 



Photograph 6: Ellesmere College Frontage, Leeston Dunsandel Road



Photograph 7: Leeston Dunsandel Road Study Area Frontage, Looking East



Photograph 8: Mountain View Place, Outside Ellesmere College Pedestrian Entrance, Looking East

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