Ashburton Labour Force Plan

Assessing Ashburton's labour force and addressing its labour shortages

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NZIER was established in 1958.

Authorship

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The assistance of Sarah Spring, (StatsNZ datalab) is gratefully acknowledged.

Key points

NZIER has been asked by the Ashburton District Council to assess the Ashburton labour force, and to develop a Labour Force Plan that addresses labour shortages.

What are the complexities?

Labour force figures provide information about the availability of labour. In a full employment situation (i.e. when the labour market is at capacity), however, labour shortages put pressure on businesses and the mismatch between supply and demand of skills increases.

The true extent of labour shortages is unobserved, given a degree of circularity between labour demand and supply – firms may choose not to hire as many staff because there is a lack of available staff to hire.

A reasonable benchmark for Ashburton's labour shortage should account for the potential of its economy

Estimating this true level of labour shortage requires information about a region's quality of living and quality of doing business. Regions with the best combination of quality of labour and quality of business are better placed to provide the required labour for their economic growth.

The required skillset of an industry's labour force varies over time, depending on its stage in the business cycle. So we estimate labour shortages for Ashburton based on the employment that we expect given its economic composition and regional features.

Ashburton is the 6th most desired district for business and the 12th most desired for living

According to our estimation of quality of doing business, Ashburton is ranked 6th in the ranking amongst the 66 districts. Meanwhile, it ranks 12th in quality of living.

This implies that Ashburton is viewed more favourably as a place to do business than as a place to live, relative to other districts.

This difference helps to explain the labour shortages prevalent in the district, as businesses attracted to the region drive strong employment demand. However, the number of people who want to live in Ashburton falls short of this demand for labour.

The current labour shortage is costing Ashburton $16 million

We estimate the current labour shortage cost the Ashburton economy at least $16 million in 2018 in terms of lost output.

A large increase in dairy production in recent years has underpinned strong demand for labour, not just on-farm and in processing, but also in supporting services sectors.

Labour supply growth has not kept up with labour demand growth, with the ageing Ashburton population exacerbating labour shortages. The "hollowing out" of the

youth labour force in Ashburton due to students moving out of the district to study also reduces opportunities to build a strong pipeline of workers in Ashburton.

The cost of labour shortages could rise to over $100 million by 2030

We forecast labour shortages will become more acute, with the total cost of these shortages expected to rise to $105 million by 2030. This represents an increase in the labour shortage from the current estimated total of 503 to 589 workers in 2030.

As an economy progresses, developments such as technological advances increase the demand for higher skilled jobs at the expense of lower skilled jobs. This means that the value of higher skilled jobs, which face an increasing shortage, to the industries rises over time.

Improving the quality of living in Ashburton is the key

Closing the gap between labour demand and supply will require an improvement in the quality of living in Ashburton to attract and retain workers in the district. This is where Ashburton District Council has the most influence within the scope of its work and can make the most effective contribution in mitigating labour shortages.

While some of the factors driving the quality of living, such as weather conditions, are outside the control of the Ashburton District Council, there are many other steps it can take to improve its quality of living rankings. These include improving the recreational facilities in Ashburton to encourage young families to settle down in the district.

Another way to increase the vibrancy of the district is to include events to welcome new migrants. Although the Council is already doing this, more prominent and regular events, plus a webpage profiling migrants, will help migrants integrate into the community and build a more diverse and vibrant district. This in turn should attract more migrants to work in Ashburton.

Promoting the Ashburton story will be vital

It is not enough to build an attractive district to live in – people have to know about it. The Council should invest in communications, through an advertising campaign and development of a dedicated website, to promote the benefits of living and working in Ashburton.

Training the future workforce

Workers stay in their jobs when there are opportunities for career progression. The Council will need to work with businesses to develop sustainable career pathways for Ashburton workers. These pathways should be promoted to motivate workers to stay in Ashburton.

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1. Introduction

Growth in the Ashburton economy has driven strong demand for labour in recent years. As the economy has grown, the composition of employment has shifted towards growth in higher skilled jobs.

However, growth in the labour force has not kept up with the rise in labour demand. This has resulted in labour shortages.

Figure 1 illustrates our estimation and forecast of employment across the different economic sectors in Ashburton over 2000-2030. A large increase in dairy production has been associated with higher employment demand in the district, not just in the agriculture sector but across the supporting services such as infrastructure delivery including drainage and waste services.

Other supporting sectors which benefit from growth in dairy production include machinery and equipment manufacturing, and non-metallic mineral product manufacturing such as fertiliser.

Figure 1 Forecast employment demand in Ashburton
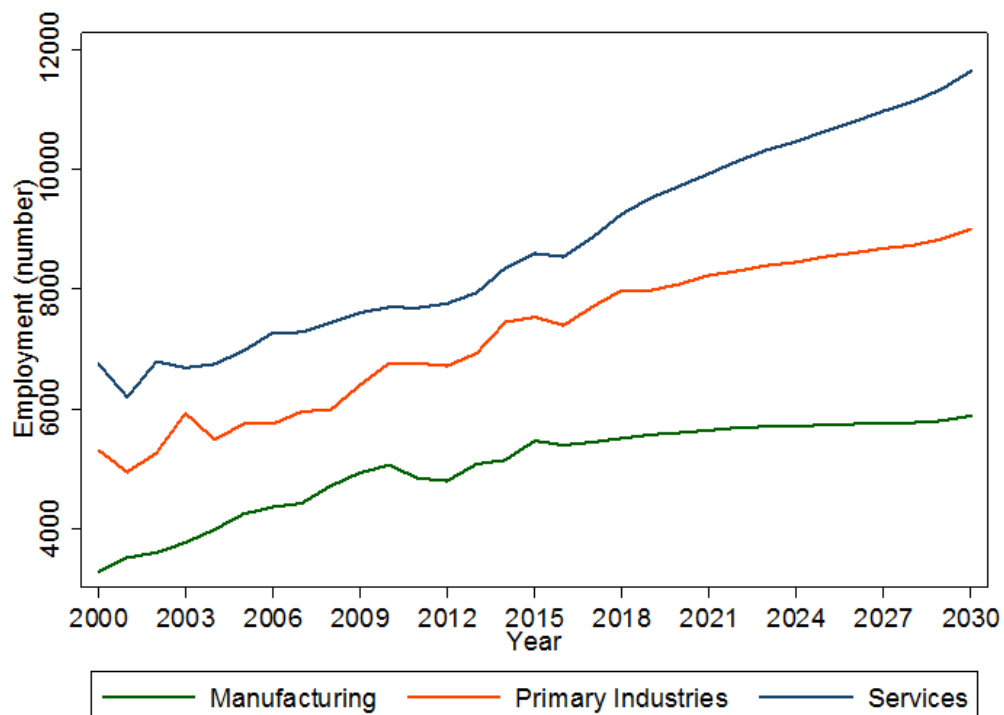
Source: Statistics NZ, NZIER

Against this strong increase in employment demand has been an ageing population in Ashburton. The shrinking working age population is exacerbating the labour shortages.

Compared to the rest of New Zealand, Ashburton has a relatively high proportion of its population in the older age brackets (Figure 2). Statistics NZ population estimates

show that Ashburton makes up 0.7% of the New Zealand population, but 0.9% of the 80 years and over population.

In contrast, Ashburton accounts for only 0.6% of the New Zealand population of 15- to 29-year-olds.

Figure 2 Proportion of New Zealand's and Ashburton's populations across age groups

Population estimate at 2013 (% of population)
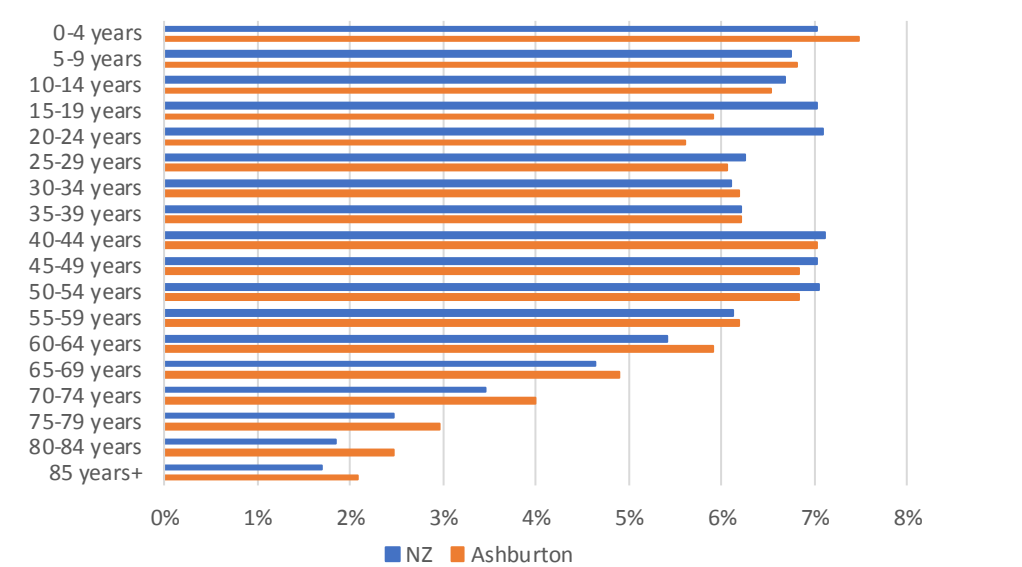
Source: Statistics NZ

Statistics NZ projects further ageing in the Ashburton population over the coming decades. It expects the proportion of 30- to 64-year-olds in Ashburton to decline from 42% in 2018 to 40% in 2038. Meanwhile, the proportion of those aged over 65 years is expected to increase from 20% in 2018 to 22% in 2038.

Figure 3 Ashburton population projections across age groups

Population projections (% of population)
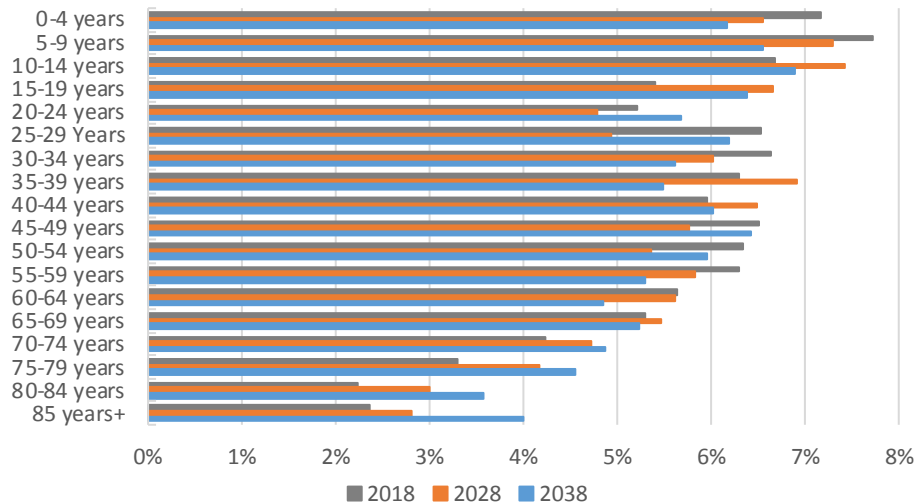
The ageing Ashburton population will limit the extent to which its workforce can grow to meet increasing labour demand. In the absence of international or within-New Zealand migration, labour shortages will become more acute.

Targeted policy levers are required to address these labour shortages, to help grow the economy and improve the living standards of the people of Ashburton.

Our report covers:

- **An analysis of Ashburton's labour force** – setting out current and likely future requirements
- **A Labour Force Plan** – for the Council and other key stakeholder to address the identified requirements.

2. Our framework and approach

Our framework is a labour supply stock-flow. The framework incorporates the labour demand composition from our assessment of the industries in Ashburton, as well as the policy levers available to the Council to address Ashburton's labour shortages.

Figure 4 Our framework for this project – Ashburton's labour market stock-flow linked to policy levers
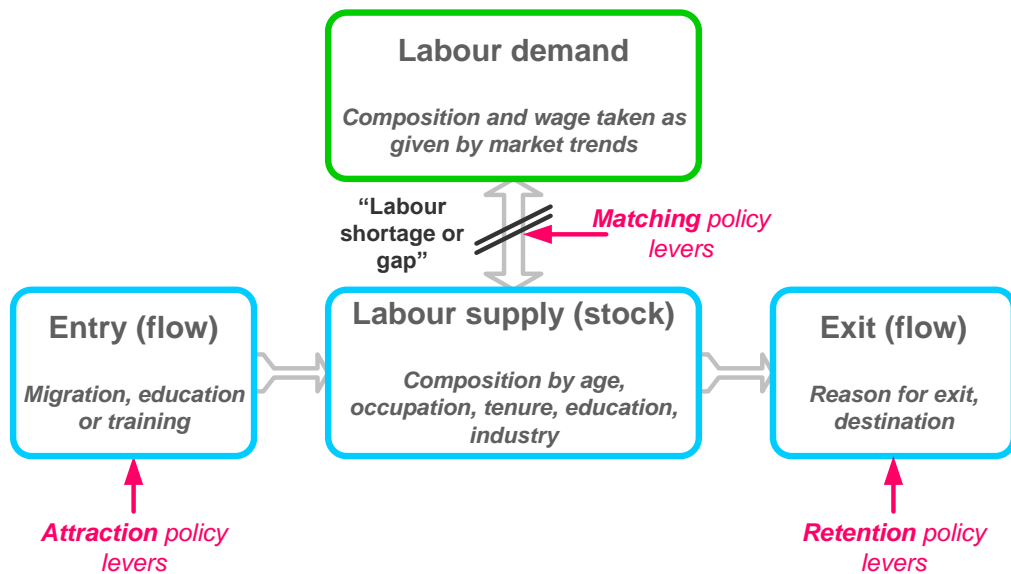
Source: NZIER

The framework consists of labour:

- **Demand** – granular analysis of labour demand by industry, occupation, education and other variables through time
- **Supply stock** – granular analysis by age, occupation, education and other variables
- **Supply flow** – the flow of workers and how it affects the composition of the workforce:
  - entry: migration, education or training
  - exit: reason for exit (retirement, relocation), destination after exit (i.e. Auckland, overseas)
- **Matching** – for a given demand and supply of labour, the quality of the matching of skills i.e. how easy is it for businesses to find the skills that they are looking for?

The policy levers for the Council are directed towards influencing the labour supply flow and the quality of the matching between the demand for labour and the labour supply stock.

Our framework incorporates three groups of policy levers that the Council can use to address the "gap" between the demand and supply or stock of labour:

1. **Attraction** (Labour supply entry flows) – i.e. Recruitment, training and other levers
2. **Retention** (Labour supply exit flows) – i.e. Ongoing training to develop career pathways within Ashburton, placemaking and other levers
3. **Matching** (Labour supply stock) – i.e. Services which support employers in their search for specific skills.

3. What's the shortage?

Compared to other districts, Ashburton provides a unique combination of quality of business and quality of life for residents. Its distance from major population centres has not stopped its agriculture sector and the associated services sectors from building a prosperous economy.

However, competition with other regions in attracting skilled labour force has been a challenge for Ashburton.

With an unemployment rate of 4.8%, the New Zealand economy is experiencing high demand for labour. Despite the national labour shortage, regions with the best combination of quality of labour and quality of business are placed better to provide the required labour for their economic growth.

The concept of labour shortage is complex as employment figures do not inform us about a lack of labour – only the amount of labour supply which has met labour demand.

There has been analysis on labour market decision-making using open and data-driven skills taxonomy, which involves creating an algorithm to determine skill requirements embedded in job advertisements (Djumalieva and Sleeman, 2018). However, hiring intentions of firms are often influenced by the labour supply available, so may underestimate true labour demand when labour supply is limited.

We account for the complexities of the shortage of labour in our assessment framework.

3.1. Outcomes of the quality of life and quality of business assessment

We start by constructing indicators for the Quality of Business (QB) and for the Quality of Life (QL). QB relates to the attractiveness of doing business in an area, while QL relates to the attractiveness for residents to live in an area. Labour will gravitate towards districts with either high QL or high QB. The best performing districts will have a strong combination of both.

Ashburton is the 6th most desired district for business and the 12th most desired for living

According to our estimation of QB, Ashburton is ranked 6th in the ranking amongst 66 districts. It ranks 12th in QL.

This implies that Ashburton is viewed more favourably as a place to do business than as a place to live, relative to other districts.

This difference helps to explain the labour shortages prevalent in the district, as businesses attracted to the region drive strong employment demand. However, the number of people who want to live in Ashburton falls short of this demand for labour.

The ranks are illustrated in Figure 5. As illustrated, Ashburton and its surrounding districts (Selwyn and Timaru) have experienced a significant increase in QB over this period. Dark (light) shading is equal to higher (lower) levels of QBs and having a darker (lighter) shading compared to the left-hand side figure means an increase (decrease) in QB between 2000 and 2017.

Figure 5 Estimated QB for 2000 and 2017
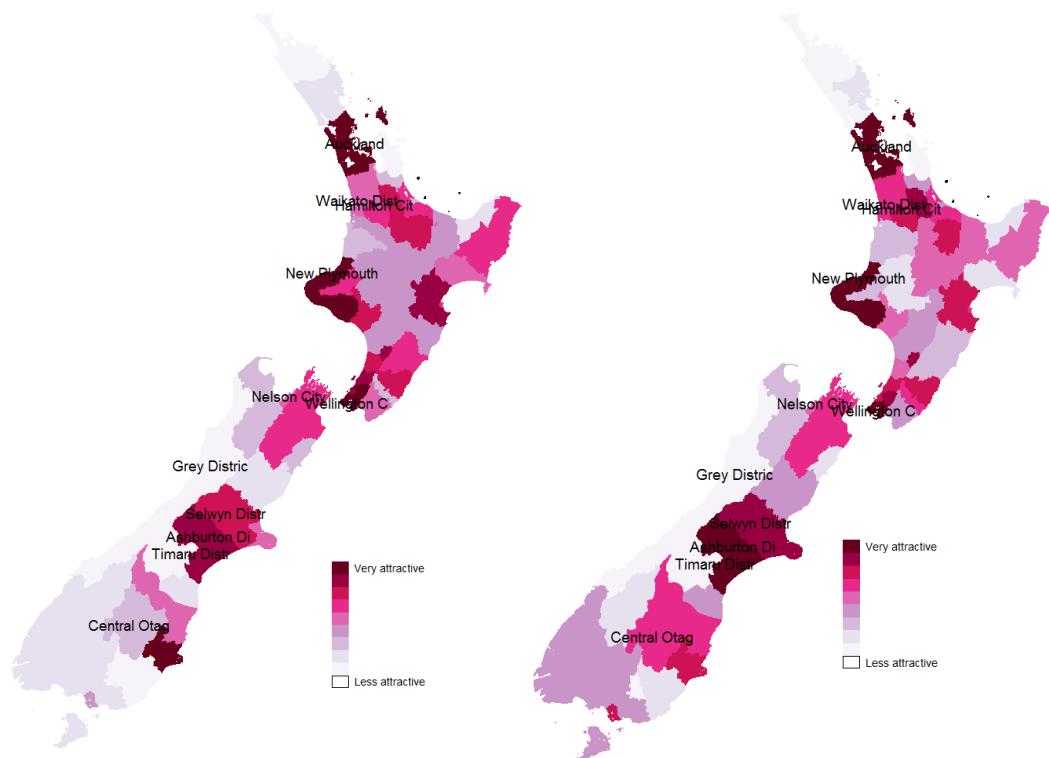
Source: NZIER (2018). Note: dark shading is equal to higher levels of QB.

Figure 6 illustrates the QL in 2000 on the left-hand side and the 2017 figures on the right-hand side. The QL in Ashburton has improved significantly over this period, with the district now having a quality of life similar to its surrounding competing districts. Dark (light) shading is equal to higher (lower) levels of QLs and having a darker (lighter) shading compared to the left-hand side figure means an increase (decrease) in QL between 2000 and 2017.

Figure 6 Estimated QL for 2000 and 2017

Ashburton's comparative advantage is its business strength

It is always tricky to isolate out correlation from causation, given some degree of circularity between labour demand and supply – for example the lack of workers available will limit hiring intentions of firms.

However, after accounting for the different features of districts and only looking at the impact of a change in QB versus a change in QL, we find that Ashburton will only remain a desirable destination for its labour force if its business quality remains strong.

Ultimately, it is the availability of jobs which will encourage people to move to Ashburton.

However, quality of life needs to be higher

While QB is the key driver of the movement of people to Ashburton (given it determines the availability of jobs), it will need to be associated with investment in promoting a higher QL.

This is particularly important as the cost of attracting labour (i.e. wages) will have to be significantly higher if investment is only on one of the aspects (QB or QL). For example, an Ashburton business will have to offer much higher wages to entice someone to move to the district if the quality of living in Ashburton was low.

3.2.   Estimation of labour shortage

How big is the labour shortage?

Labour will gravitate towards districts with either high QL or high QB. The best performing districts will have a strong combination of both.

For example, when it comes to economic composition (i.e. the shares of different industries in a region's economy) or quality of life and quality of business, Ashburton will not be a perfect substitute for bigger job markets such as Auckland, Wellington and Christchurch.

The question is:

> *What is the potential level of quality of life and quality of business that Ashburton is likely to have?*

To answer this question, we estimate the likely level of QL and QB based on the share of different activities in the economy across different districts. Hence, our response to the question is:

> *The maximum level of QL and QB that Ashburton could potentially have is based on its economic composition and its regional features.*

We estimate the levels of QL and QB that an economy with the features of Ashburton economy, such as the share of different industries in production, could *potentially* expect to have. This provides us with a range of expected QL and QB for different districts across New Zealand. Accordingly, we estimate Ashburton could *potentially* have 2.86% higher QL and 2.27% higher QB than is currently the case. This would imply an increase in the ranking of Ashburton by 1 place for both QL and QB.

This forms the counterfactual which provides the true (unobservable) level of labour supply and demand against which the current labour supply and demand is assessed to find the extent of the labour shortage.

We estimate the current labour shortage to be 0.22% (of the current employment figures) and closing the gap would require a significant improvement of quality of life and quality of business.

The stress of the labour shortage for Ashburton industries is significant

We also consider a counterfactual scenario where the constraints of the current economic composition of Ashburton were relaxed[1]:

> *What's the shortage without any constraints – i.e. if the supply of labour was flexible and industries could hire as much labour as needed?*

Answering this question shows the stress on Ashburton industries, as it shows that demand for labour would have been even greater if it was not constrained by the current industry composition and the effects of composition on labour supply.

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[1] The rationale is that the supply of labour force to different regions is constrained by the size of different economic activities in the regions. Therefore, a specific industry attracts a number of mobile migrants to a region (that we estimate in our models).

We estimate the labour shortage to be 24%, relative to the true labour demand if Ashburton industries were provided with an unlimited supply of labour.

The negative impact of labour shortages is felt across all industries. The share of the primary sector in Ashburton remains large in absolute numbers, but the marginal expansion of sectors will be most significant for the services sector.

This reflects the fact that the dairy sector supports demand for many service sector businesses. This implies the services sector in Ashburton will increase more than the other sectors (2.41%) if the labour supply shortage was to be addressed.

Figure 7 Labour shortage for different economic sectors
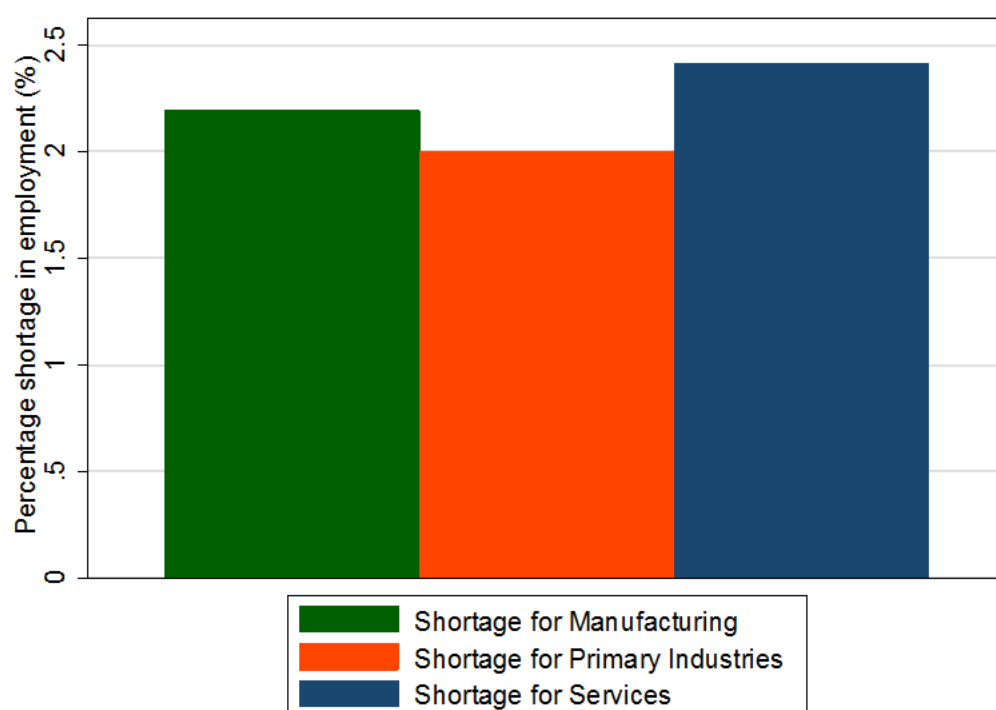
Labour shortage cost Ashburton at least $16 million in 2018

The labour shortage for primary industries will steadily increase over the next decade, as increased output means increased demand for labour. Given the flow-through impact of increased dairy output on demand for supporting services, the labour shortage for services will be much more significant (Figure 8). The labour shortage for manufacturing will increase too.

We estimate the total labour shortage in 2018 to be 503 employees (0.22% of current Ashburton employment).

Our estimation of the **minimum cost of the labour shortage in terms of lost output to the Ashburton economy is $16 million in 2018**.[2] We forecast this will increase to $105 million by 2030, reflecting a shortage of 589 employees.

Figure 8 Labour shortage over time, 2000-2030[3]
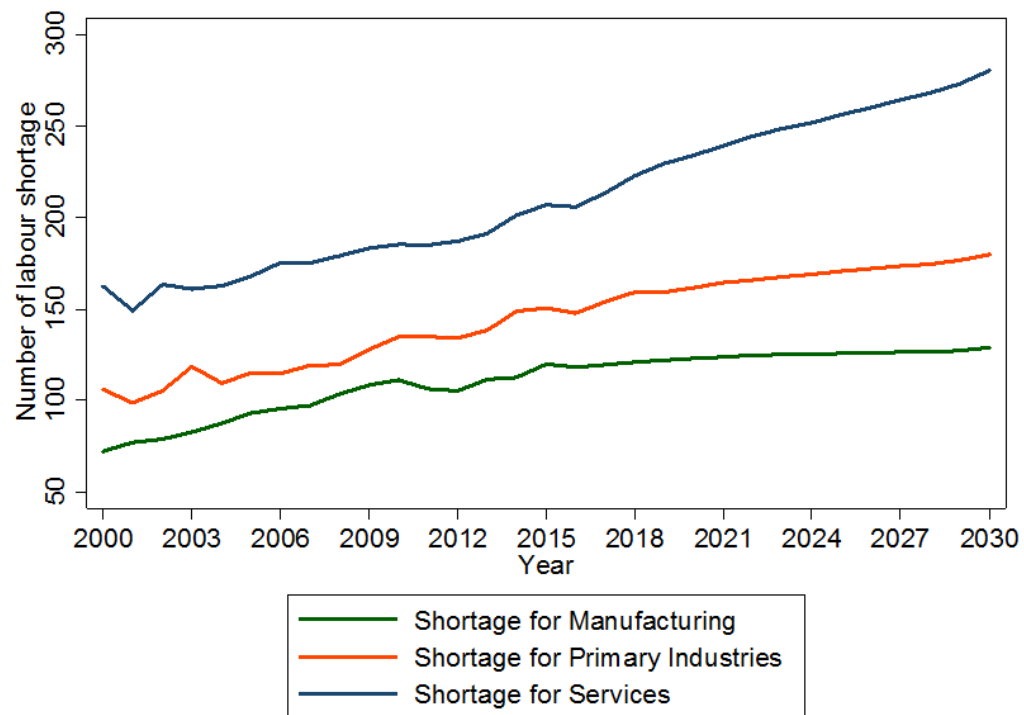
Source: NZIER (2018)

3.3.   Limitations of our analysis

Distinguishing between drivers and correlations of migration of the labour force is controversial. We have used the best possible practice for estimating labour shortage figures. This is based on the recent progress in the literature on quality of life and quality of business.

Our framework is based on the Ashburton economy over the past few decades, taking into account the trends that comes with business cycles. This means our forecast of the future shortages do not incorporate the impact of any policy changes, such as the effects of changes to water quality regulations on agriculture production.

Our results provide sensible outcomes for Ashburton according to our anecdotal understanding of current economic conditions. This however needs to be tested on a wider range of districts with different living and economic compositions. Testing the causality of the relationships that we have used will be a question for future studies.

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[2]   These figures are based on our realistic estimation of labour shortage based on the constraints from the economic composition of Ashburton.

[3]   Our estimation figures are provided in Appendix B.

4. Literature review

4.1. How could the labour shortage be addressed?

This fundamental question has been discussed in only a few studies in New Zealand. Income and housing cost (rents) are the two main drivers of population location. Our results suggest that higher wages are important for attracting more workers to Ashburton, but this will need to be associated with improved affordability of housing and greater availability of housing choices.

In addition to income and rent, we also need to understand the importance of other factors e.g. living conditions, that influence migration and the labour force. This will provide information about the needed amenities and facilities for attracting labour force.

Apatov & Grimes (2016) introduce the presence of higher education institutions as a driver for regional growth in New Zealand. Torshizian (2017) discusses the desirability of factors of living environment, and particularly residential density and household crowding, in Auckland. There have been many studies on the clustering of population in New Zealand. Maré, Coleman & Pinkerton (2011) study the patterns of population location in Auckland.

Some recent studies discuss the importance of regional endowments, such as hours of sunshine, temperature and wind (e.g. Fleming et al, 2018). While understanding the importance of the endowments to clustering of population is important, it does not improve our knowledge of the drivers of employment in New Zealand and particularly in Ashburton.

Becker et al (2013) consider labour attraction and retention strategies in rural and remote Queensland communities, and highlight the need for communities and businesses to work together to overcome labour shortages in rural and remote locations. This is because workers only stay in a region if they feel they belong in the community, hence it is important to develop support structures for employees and their families.

Many small communities overseas also focus on immigrant attraction to fulfil labour market requirements. Challenges include settlement services, appropriate housing, transportation systems, suitable employment, cultural amenities, diversity in the school system, and community tolerance (Wiginton, 2013). The study finds increased institutional capacity and resources are needed to support immigrant welcoming initiatives.

The literature findings show that many factors drive the attractiveness of living in a region, including wages, diversity of job opportunities, availability of suitable housing, presence of supporting institutions and living conditions.

4.2.   Regional development policies

McIlrath and Erasmus (2017) highlight in their assessment of the Ashburton economy the challenges the district faces with an ageing population and the resultant decline in its working age population. Retail, accommodation and food services sectors are areas of opportunity given the expected increase in tourism activity in the district. Ashburton's exposure to global forces given the concentration of dairy in its economy leaves the district vulnerable to negative external developments such as a slowing in the Chinese economy. Improving the connectivity of Ashburton through roads and telecommunications was an important means of supporting the district's economic development.

Hooper (2018) recommends the Ashburton Economic Development Strategy should be closely aligned with the Canterbury Regional Economic Development Strategy and be refreshed every 4-5 years, in order for Ashburton District Council to maximise economic development within the region in the near term. He also recommends the Council should partner with other organisations, such as ChristchurchNZ or Te Runanga o Ngai Tahu, to ensure efforts are not duplicated.

There have been success stories overseas of communities and universities working together to retain graduation students in their communities. The Trainee Sør program is a collaboration between the regional energy company, the regional skills development agency, the City of Kristiansand, and the regional university which provides trainees with professional and personal development opportunities whilst promoting innovation and knowledge sharing amongst the businesses. Over 18 months, trainees work for three different employers and there are personal development opportunities through mentorship for each trainee, educational courses, study excursions, and team building and social events. This encourages networking within the community. Around 90% of trainees have been offered work in the region, with the majority staying on in the area (MDB Insight, 2017).

Sustainable regional development policies require residents to have a sense of ownership in the initiatives they are involved with. Dyer's analysis of self-reliant policies in the Nelson regional economy (2016) found that worker co-operatives where residents shared in the wealth and leveraged the economic strength of anchor institutions led to more successful outcomes for regional economic development. It also allowed indigenous residents to incorporate their values and intergenerational vision into the business.

Nel and Stevenson (2014) highlight the importance of benevolent entrepreneurs which create activity (such as events) to attract other businesses and create vibrancy and economic diversification in a region. They also point out how market-based policies and reforms over the past decade have seen an expansion of tourism towns, in contrast to the contraction in resource-based and manufacturing towns. They find that tourism-elated growth corresponded to economic and population growth.

Howison (2014) discusses the important role of the transient overseas workforce in filling an important gap in servicing tourism in Queenstown given its seasonal nature. Cultural differences matter, with Europeans considered to have more favourable work ethics than South Americans (and the local workforce). She finds that transient workers tend to stay because of location, activities, lifestyle, money and work

experience. Short term measures such as positive feedback, vouchers and training were also useful for staff retention.

These transient workers tend to move on due to low pay and a lack of opportunity (as well as the limitation of the work visa). Given the high cost of recruitment there has been more reliance on working holiday and work permits to fill the gap, which leaves Queenstown businesses vulnerable to changes in government policy and global events which affect the influx of workers.

Prescott et al (2017) discuss the crucial role of a governing authority in managing competing interests of stakeholders of a regional economic development scheme, to ensure there is a clear shared vision. Although increasing connectivity (through access to the internet and transport network) is important, a critical mass of customers is required to justify the upfront investment involved.

Places such as commerce hubs provide opportunities for "bumping" and connecting, which would reduce the need for commuting. This "bumping" relates to the chances of meeting like-minded people physically through being in the same vicinity, which means increased opportunities for collaboration. The commercial outcome of these investments should be shared between hubs and commuters. It was important to create a unique selling point to promote the region so that it is seen as an attractive destination to visit and move to. Successful initiatives which encourage social interaction and engagement will enhance place-making, thus improving the attractiveness of the region.

Southland Workforce Strategy 2014-2031

Venture Southland's Southland Workforce Strategy 2014-2031 (Jackson, 2015) focused on four key groups to address the labour shortages in the region:

1. increasing net migration
2. increasing the participation rate of workers aged 15-25
3. increasing the participation rate of women
4. increasing the participation of those aged over 55.

Across this plan are the over-arching themes of Attraction, Retention, Upskilling and Utilisation.

Southland is facing a structural ageing of its population and with it a shrinking workforce, at the same time as employment demand is growing. These issues are similar to what Ashburton is facing.

Venture Southland recommends a range of measures to address the growing labour shortages based on the focus on those four key areas they have identified. Increased participation rates could be aided by more flexible working arrangements. Meanwhile, training, jobs rotation and intergenerational mentoring would improve the culture of knowledge sharing and create sustainable career pathways for both young and older workers, as well as migrants. Having a more engaged workforce would mean long-term social and economic impacts for the region.

Many of these strategies identified are relevant to Ashburton given the similar situation the district is facing. Our policy levers should aim to increase the size of the Ashburton labour force through increasing both net migration and the participation rate in some parts of the labour force.

Implications for Ashburton

The relevance of the findings from the literature review for Ashburton can be broadly summarised as: increasing labour supply through attracting workers into the region and encouraging more residents to remain in the workforce; knowledge sharing to increase the capability and opportunities for the Ashburton workforce and develop its pipeline; and ensuring buy-in of a common vision across all stakeholders.

5. SWOT analysis

We summarise our SWOT analysis of the Ashburton labour force in the table below. While Ashburton has benefited from the improvement in dairy farm income in recent years, its concentration in this industry also leaves the district exposed to any unfavourable developments in the dairy sector.

Table 1 Ashburton labour force SWOT analysis

Strengths:	Weaknesses:
- Co-location of different primary industry land uses - Top NZ dairy production district - High wages relative to other regions - Tourism industry that can be leveraged to attract visitors and residents - Low cost of living and affordable housing	- Ashburton City is a small city for its primary export production - Lack of Tertiary Education providers within Ashburton makes it hard to build broad pipeline of workers - Concentration of dairy sector leaves the district vulnerable to developments which negatively affects the dairy sector e.g. Mycoplasma bovis outbreak - Lack of infrastructure to support business activity e.g. Port Timaru makes Timaru more attractive for businesses to base there - Gap of young residents, who leave for schooling and only return much later to raise a family or retire
Opportunities:	**Threats:**
- Potential spill-over effects from strong population growth in adjacent areas (e.g. Selwyn) - Strong national net migration means potential to expand workforce – either permanently or on seasonal basis - Christchurch rebuild winding down, making labour available for other industries	- Tightening in net migration, largely from policy changes e.g. Skilled Migrants points system, holiday visas - Attractiveness of other town centres (Timaru, Selwyn and Christchurch) – Ashburton has "Middle Child Syndrome". - Lack of critical mass makes it hard to compete with nearby districts for workers.

Source: NZIER

6. IDI framing

6.1. IDI framework

The Integrated Data Infrastructure (IDI) is a large research database consisting of microdata about people and households. Data from government agencies, Statistics NZ surveys, and non-government organisations (NGOs) are linked together and can be used to help answer questions about complex issues affecting New Zealanders.[4]

Figure 9 Overview of the Integrated Data Infrastructure
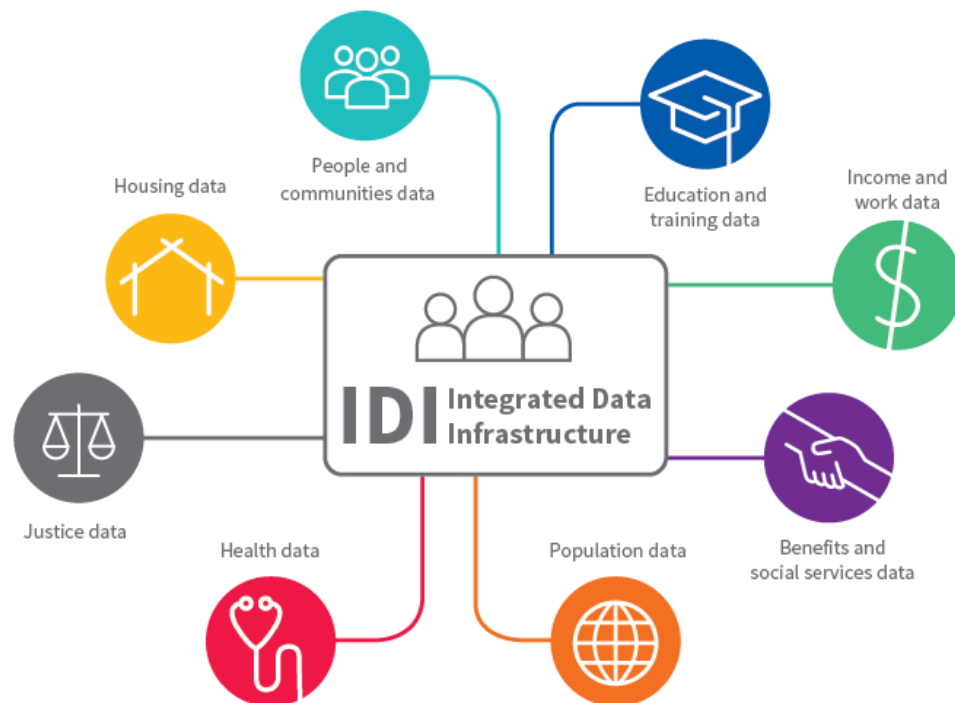
Source: Statistics NZ

We use the following datasets in the IDI to delve into the Ashburton labour force at a much more granular level. By tracing through the pathways of Ashburton workers, we can answer more targeted questions such as where workers come from and where do they move on to?

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[4]   https://www.stats.govt.nz/integrated-data/integrated-data-infrastructure/

There is evidence to suggest that the primary sector in Canterbury has low worker turnover. The worker turnover rate in 2016 for the primary sector in Canterbury was 23% – lower than the national average at 29% and other key dairying regions such as Southland (28%) and Otago (30%).

A low worker turnover rate does not mean the retention rate should or could not be increased further, but it does suggest that on this aspect the Canterbury labour market already performs well relative to the other regions.

Figure 10 Canterbury has the lowest worker turnover in the primary sector

Worker turnover rate (%); Agriculture, forestry, and fishing; 2016
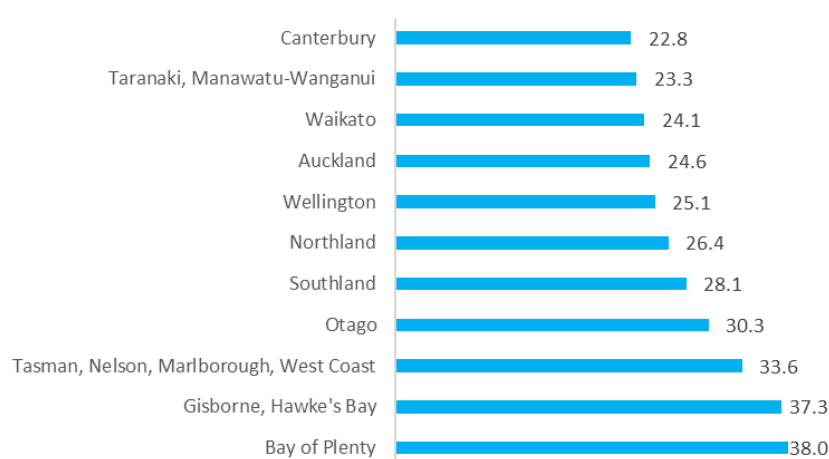
Source: Statistics New Zealand, LEED

It is important to note that worker turnover doesn't necessarily imply exit of the labour market (i.e. migration to another region such as Auckland). Workforce turnover can also occur within the region, for example when workers change jobs more often without changing their location. Nonetheless, worker turnover is a reasonable indicator for worker retention in a region.

6.2. Findings from our IDI analysis

More people moving out of Ashburton to the other districts

IDI data on internal migration shows the net number of people moving out of Ashburton has been increasing in the past few years (Figure 11), with net outflows out of Ashburton totalling 129 in 2016 (the latest year IDI data is updated till 2016).

Figure 11 Net internal migration

Between Ashburton and all other TLA's
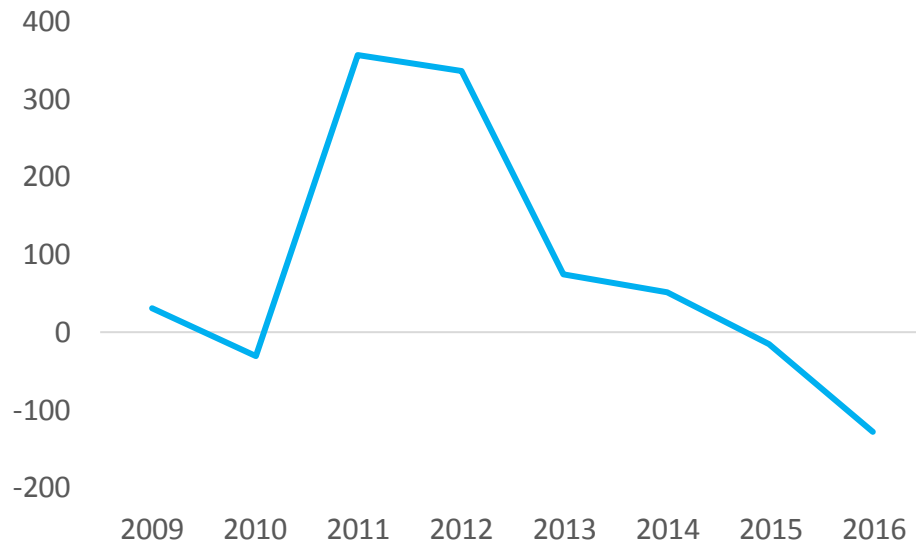
A look at these internal migration flows across the New Zealand districts shows that since 2009, Ashburton has had the greatest number of migration flows with its neighbouring districts. The number of people coming into Ashburton have predominantly been from its neighbouring districts, and Auckland.

Figure 12 Internal migration to and from Ashburton district

Aggregate total number of people moving to and from Ashburton since 2009
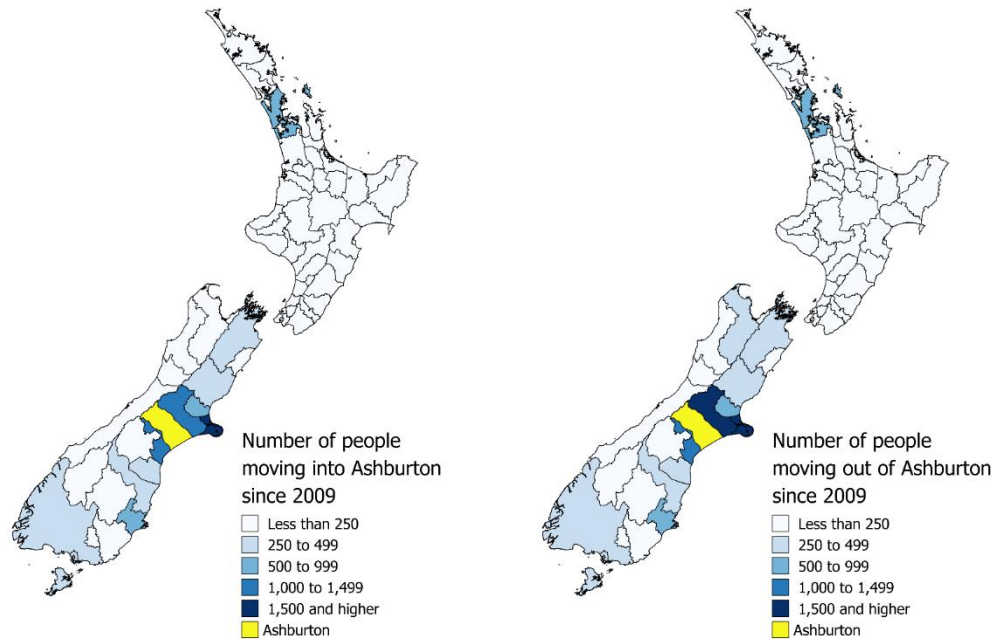
Looking at net flows of people moving in and out of Ashburton, we can see that with more people moving out of Ashburton to its neighbouring districts than the number of people moving in, this has meant there has been a concentration of Ashburton residents moving out to neighbouring districts. There has also been a substantial net outflow of Ashburton residents to Tasman since 2009.

Despite the substantial number of people moving out of Ashburton to Auckland, this has been more than offset by the number of people moving into Ashburton from Auckland. This means that Ashburton has gained people from Auckland since 2009.

Figure 13 Net internal migration

Aggregate total to and from Ashburton since 2009

Net internal
migration of Ashburton
since 2009

- █ Net outflows of more than 50
- █ Net outflow of between 9 to 50
- ☐ No meaningful change
- █ Net inflow of between 9 to 50
- █ Net inflows of more than 50
- █ Ashburton
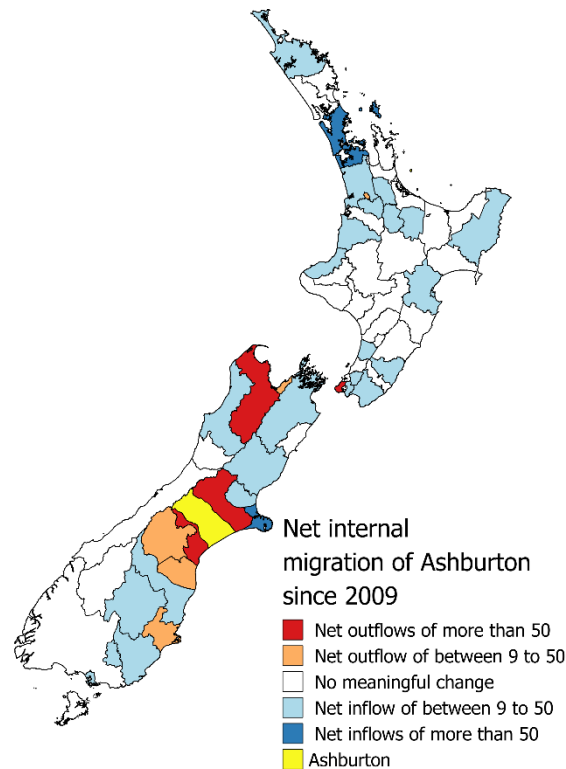
Source: Treasury, NZIER

Growing number of migrants

Since 2009, an average of 300 more people a year have migrated into the Ashburton district from overseas than leave. As a percentage of Ashburton's population this corresponds to about 1 percent, compared to the national average of 0.4 percent of total population since 2009. In other words, Ashburton has been able to attract and retain more international migrants than other regions.

This can also be seen in the following figure, which shows Ashburton has more net international migrants than most similar regions, except Selwyn which has seen net inflows of 3 percent of its population. This is not surprising as the Christchurch rebuild has attracted migrants into the region, with Selwyn being able to take advantage given it is so close to Christchurch.

Figure 14 Net international inflows

By selected TLAs
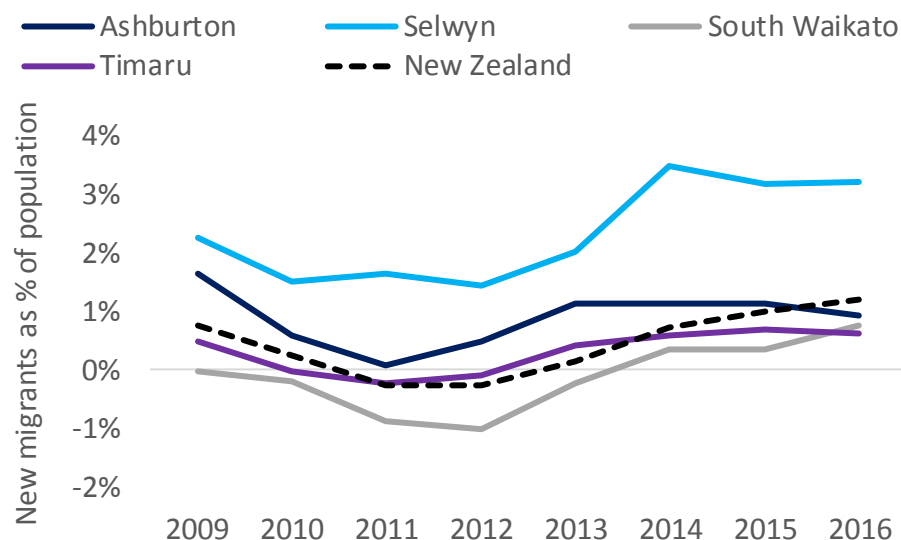
Source: NZIER (2018)

Figure 15 shows net inflows of migrant by ethnicity, with Asians being the largest group migrating into Ashburton since 2009 (1,000 people). Eighty five percent of these Asian migrants are from the Philippines.

The next largest ethnicity groups are Europeans (560 people since 2009) and Pacific (495 people since 2009). Of the European migrants, most come from the United Kingdom, while of the Pacific migrants most are from Samoa and Fiji.

Figure 15 Net international inflow by ethnicity
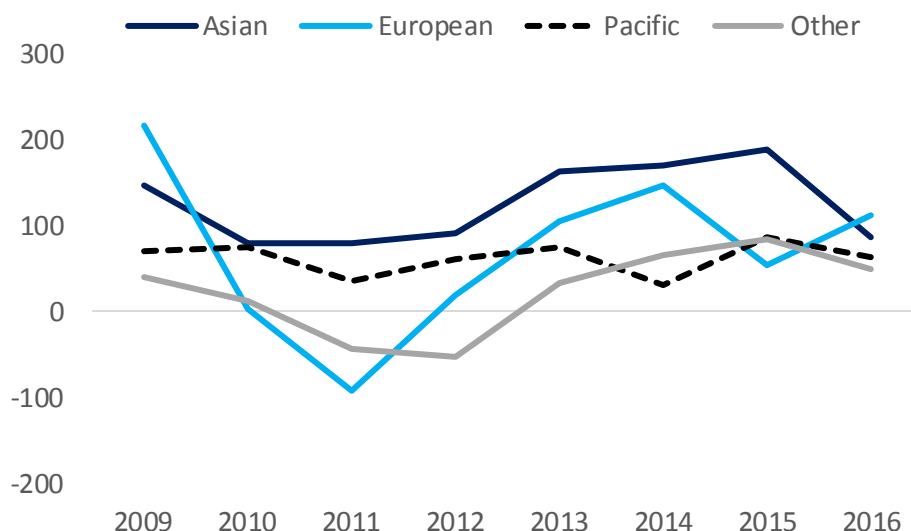
Source: NZIER (2018)

The majority of Ashburton's migrants move to the region to work, with over 41 percent arriving on work visas (Figure 16) or 2,200 people since 2009. Another 960 people have moved to Ashburton on resident visas, which means they are not required to work but are legally able to. Ashburton migrants are also likely to be in prime working age, with 65 percent of migrants being between 15-49 years old. This shows how important migrants are in filling the gap of young Ashburton residents who have left the district to study or pursue early career opportunities i.e. counter-acting the "hollowing out" of Ashburton residents in the 15 to 29 year age group.

Figure 16 Inflow of migrants by age and visa type

Since 2009

Visa type

Other; 12%

Work visa; 37%

Resident; 16%

Student; 7%

Unknown; 28%

Age

35-49 years; 30%

Under 15 years; 17%

15-24 years; 19%

25-34 years; 34%
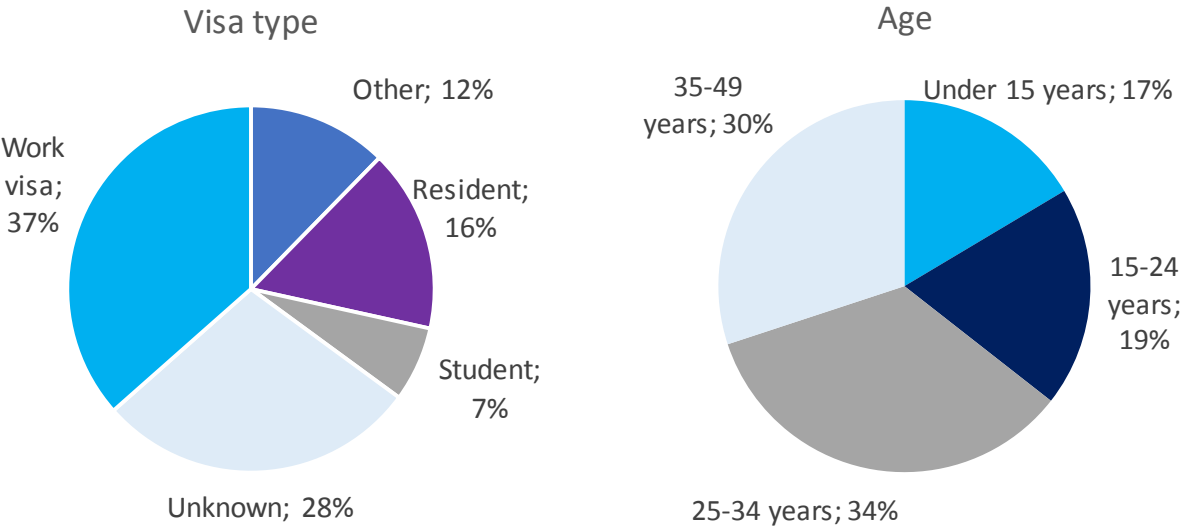
Source: NZIER (2018)

7. Stakeholder interviews and workshops

We engaged with businesses in interviews and a workshop to delve deeper into the key issues around recruitment of workers to Ashburton. There were some familiar themes, with businesses noting the difficulty in attracting workers to move to Ashburton. The lack of career progression opportunities also made it difficult to retain workers in Ashburton.

Newcomers to Ashburton tend to spend around two to five years in the district, but those who stay beyond five years tend to stay in Ashburton for the rest of their life.

Personal circumstances also had a large influence on labour supply, with workers often moving to Ashburton to be with someone. Conversely, the movement of a partner to another area was often a reason for a worker to leave Ashburton.

7.1.   Skills and training

Businesses highlighted the difficulty in not having a pipeline of workers with skills ready for the market. The unreliability of the unemployed domestic workforce was noted as an issue.

There was a strong desire to see a consistent set of vocational training standards, which could be achieved with industry accreditation. This stemmed from recent experience with uncertainty over the validity of the qualifications of some applicants, particularly recent migrants.

Training is expensive in terms of time and financial cost. Some businesses took on trainees, but there was generally a hesitancy to invest in the training and upskilling of staff given the prevalence of poaching of staff in many industries. Besides losing staff to other businesses, there was also the uncertainty over whether staff on working holiday visas will have to leave the country after a few years should they fail to get approval for a residency visa.

Workers often decide to move to a job in Ashburton as a stepping stone to work in a role with more responsibility and then grow with the company. This highlights the need to develop opportunities for career progression in roles in Ashburton, so that staff will not move on to similar roles in other regions once they have obtained that experience.

This general uncertainty over whether staff will stay beyond a year or two makes it difficult for businesses to plan over the longer term, and discourages them from investing in their staff. This is turn tends to reduce staff's commitment to the firm, creating a negative cycle.

7.2.   Immigration

Migrants have helped to alleviate labour shortages in Ashburton. However, the influx of migrants in recent years have brought with it challenges. As mentioned, the inability of migrants to convert their working holiday visa to a residency visa has contributed to the churn in workers, with businesses losing workers they have trained for a few years who then have to return home.

The lack of certainty in migration policy was highlighted by businesses as a hindrance in closing labour shortages in Ashburton. Businesses noted the deterioration in labour shortages following the change in immigration policy with the shortening of the skills shortage list.

A regional skills shortage list specific to Ashburton would be useful, to recognise that regions are not homogeneous so there may be severe labour shortages in particular industries in Ashburton which are not felt by that same industry in another region. Although there is a Canterbury Skills Shortage list (CSSL), this is targeted at the rebuild and recovery of the region from earthquake damage suffered in 2011.[5]

The protracted immigration application process often deterred businesses from hiring migrants, given the potential costs involved such as engaging immigration advisers to guide them through the application process. On the flip side, the lack of certainty over whether they will be able to gain residency after a few years of working in Ashburton also deters overseas applicants. These applicants may choose to work in other countries such as Canada.

Businesses noted the cultural fit of migrants was important. The influx of migrants in recent years has made Ashburton more multi-cultural. Initiatives by the Council to encourage the integration of migrants into the community was highlighted by businesses as a success story.

It was important for migrants to have a strong support network, with businesses noting that migrants who stay for two years were more likely to integrate into the community and stay on in Ashburton.

7.3.   Living in Ashburton

Although there are many advantages of living in Ashburton, many businesses felt these were not promoted enough to those outside to encourage them to work in Ashburton.

The low cost of living, particularly with housing, was considered a main benefit of living in Ashburton. The abundance of outdoor recreational activities, and proximity to ski fields, were also highlighted as key benefits.

Businesses suggested the Council website should have a centralised portal dedicated to recruitment, where businesses can post job ads and workers can go to look for work in Ashburton and find out information about living in Ashburton. It would also outline key requirements for living in Ashburton, such as a drivers' licence to get around the district.

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[5]   https://www.immigration.govt.nz/knowledgebase/kb-question/kb-question-4551

Businesses offered non-monetary benefits to recruit for workers in Ashburton, particularly for roles which require specific skills. These benefits include flexible working conditions such as remote working, or assistance with accommodation.

However, many things also needed to be improved to entice workers to Ashburton. For example, the limited choice in shops on the main street meant residents often made a trip into Christchurch to shop. Similarly, the lack of family-friendly attractions in Ashburton means families have to go to other districts for recreational activities.

These factors reduce the vibrancy of the city and may discourage workers to move to Ashburton.

There was a recognition amongst many businesses that workers may move to bigger cities to gain more experience. Similarly, Ashburton residents often left the district when young to attend boarding school and university. What is important is that these residents are encouraged to return to Ashburton with newly acquired skills later on in life, perhaps when they decide to settle down and raise families.

Overall, businesses felt the need for Ashburton to develop a unique selling point that clearly and succinctly shows why workers should live and work in the district. Selling this "Ashburton Story" to the outside world would be a key channel for attracting workers to Ashburton.

7.4.   Tourism

Tourism was considered an important means of promoting Ashburton and hence helping the recruitment of workers. Tourists coming through Ashburton can experience the district and hence be more likely to consider working in Ashburton in the future.

Tourists could also help to promote the positive aspects of the Ashburton lifestyle to family and friends back home, which would help in encouraging more people to work in Ashburton.

7.5.   Collaborating with other districts

Businesses often found themselves competing with other districts for workers. Commuting was often a double-edged sword – while it allowed people who lived in neighbouring districts to work in Ashburton, conversely some Ashburton residents chose to commute to work outside of the district.

Businesses highlighted opportunities for Ashburton District Council to collaborate with other district councils to attract working holiday visa workers to the wider region by developing a programme of jobs rotation across the different districts. This would expose these workers to different areas of rural New Zealand and increase the likelihood of them choosing to stay on in one of the districts after the programme.

For some roles that are quite specific to Councils such as planners and environmental health officers, there should be a programme that provides opportunities for workers to move across districts, to promote career progression.

Given the projected strong growth in neighbouring districts such as Selwyn, there are opportunities to leverage off this growth and to encourage Selwyn residents to

commute to work in Ashburton, even if it is part of a wider programme of job rotation around the districts.

Figure 17 Projected growth in households in Canterbury region's districts over 2013-2038

Average annual change (%)
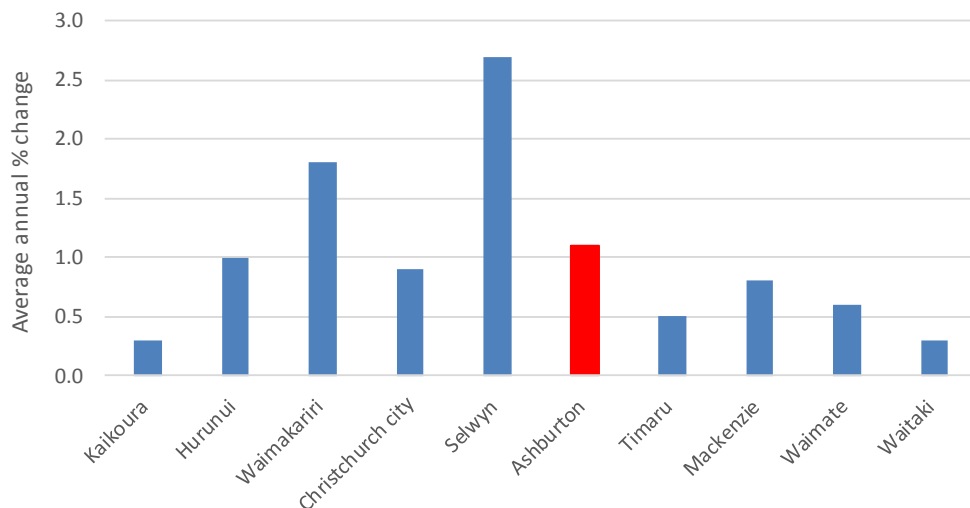
7.6.   Technology

Technological advances have enabled businesses to offer more flexible working conditions such as remote working. This has helped businesses to recruit for workers in Ashburton.

Changes in technology have also brought changes to the skills required for roles. While a degree of automation has helped to replace some of the lower skilled and repetitive jobs, it has created demand for workers with more technical skills.

The use of technology has also helped to alleviate some of the workload of workers in Ashburton. For example, patients can get a diagnosis online hence relieving the need to be assessed by a general practitioner and reducing the need for general practitioners to be located close to patients.

7.7.   Stakeholder buy-in

The buy-in of stakeholders increases the chances of success for any strategy. Some businesses could provide an opportunity for workers to take an ownership share of the business as a way to recruit workers to Ashburton and encourage them to stay with the organisation (and hence in the district).

Those we spoke to also flagged the importance of buy-in: the Labour Force Plan needs to have a common vision amongst all businesses.

8. Labour Force Plan

The core of Ashburton's Labour Force Plan is for the district to position itself as the most attractive rural labour market in New Zealand. Supporting that would be ways to promote this vision to the outside world.

We frame the policy levers under the responsibility of three key stakeholder groups: the Ashburton District Council, Ashburton businesses and central Government.

Figure 18 Framing the policy levers
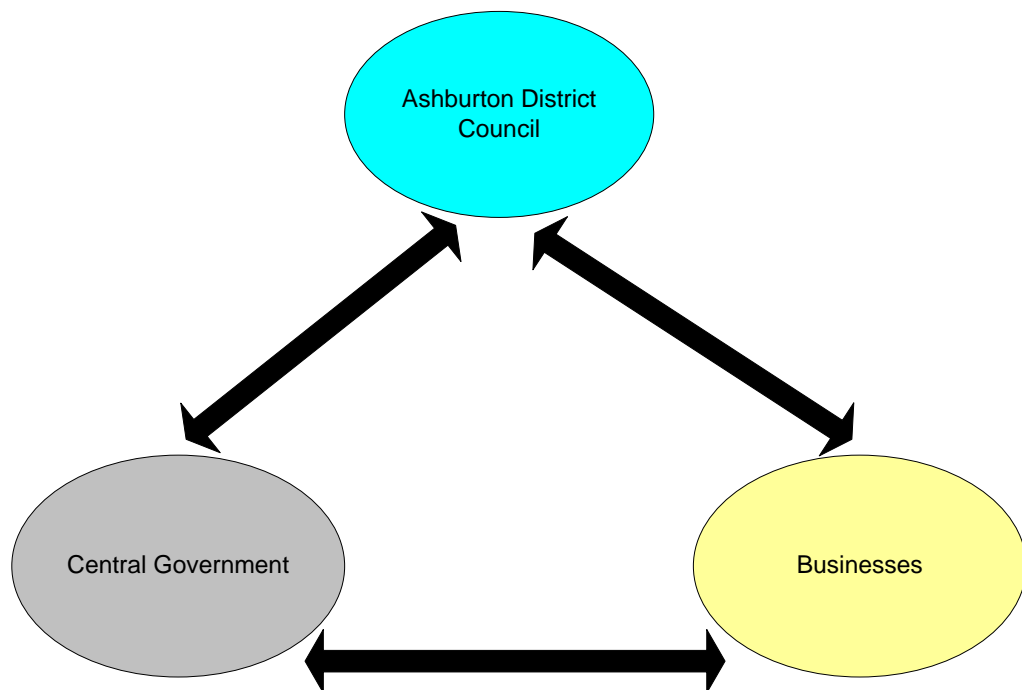
8.1. Ashburton District Council

Place-making

The best contribution the Council can make to address the labour shortage is to make Ashburton as desirable a place to live and work in as possible i.e. increase the QL in Ashburton. A large part of this involves place-making and improving the vibrancy of Ashburton. McIlrath and Erasmus (2017) also highlight the importance of place-making in contributing to the broader economic development of Ashburton.

The Ashburton District Council 2018 Annual Residents' Survey[6] finds a decline over the past year in residents' satisfaction with amenities such as sports fields, the Ashburton Domain, playgrounds and the Ashburton Museum.

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[6] https://www.ashburtondc.govt.nz/SiteCollectionDocuments/Have%20your%20say/ADC%20ARS%20Report%202018.pdf

Ensuring the district has high quality amenities such as modern recreational facilities will increase the attractiveness of Ashburton to young families, and mean residents are less likely to look outside of the district for leisure. We recommend an audit of the recreational facilities currently available in Ashburton and look at the feasibility of new facilities which could be supported with investment from the Provincial Growth Fund.

Modernising the main street of Ashburton will also encourage high quality retail outlets to set up in the district, with the greater choice for shoppers likely to improve the quality of living. The Ashburton District Council is already undertaking a streetscape renewal project to revitalise the Central Business District[7], and the focus of this should be on attracting high value businesses to the CBD.

Attracting young families to Ashburton

The Council can most effectively increase the long-term attraction and retention of workers in Ashburton by encouraging young families to move to the district. People often migrate because of personal circumstances, and young families which choose to set up in Ashburton are more likely to settle down in the district.

Children residing in Ashburton are also more likely to be part of the district's workforce in the future. Encouraging more young families to settle in Ashburton would also support the tight-knit community vibe of the district.

Environment Canterbury Regional Council[8] projects the number of families will increase from 10,100 in 2018 to 11,700 in 2038.

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[7] https://www.ashburtondc.govt.nz/our-council/meetings/agendas-and-minutes/AgendasAndMinutesDocs/Ashburton%20CBD%20Streetscape%20Renewal%20Report%205%20April.pdf

[8] Canterbury Population Subnational Household Family Projections

Figure 19 Projected growth in Ashburton households over 2013-2038

Change in number of households, medium projection

Household numbers and type, Ashburton District
Medium projection, 2013(base)–2038
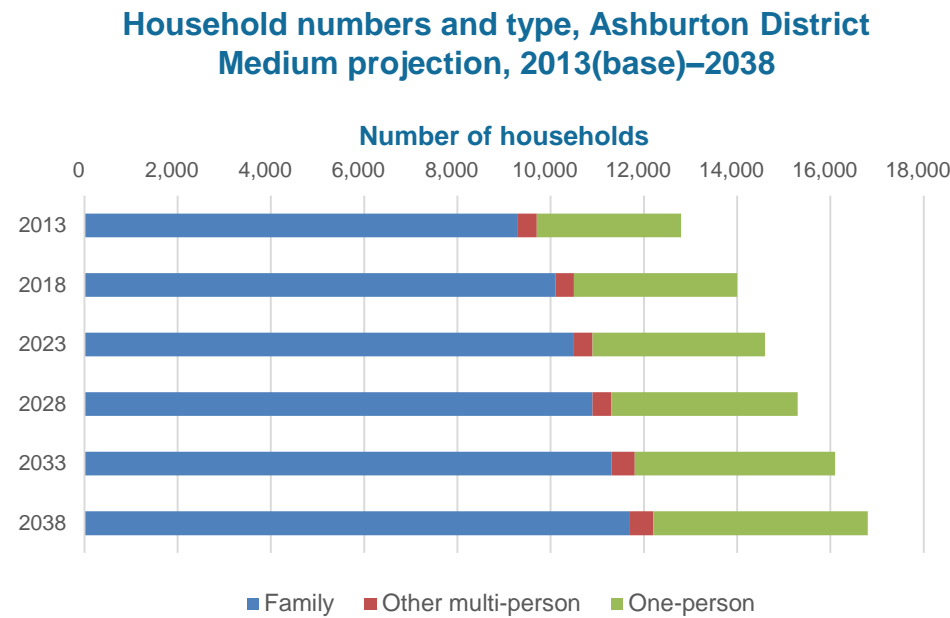
Source: Environment Canterbury Regional Council, Statistics NZ

But a large part of that growth is expected to be driven by an increase in the number of couples with no children, which is projected to increase from 5,200 in 2018 to 6,600 in 2038. In comparison, the number of families with children is expected to increase from 5,200 in 2018 to 5,600 in 2038.

Figure 20 Projected growth in Ashburton families over 2013-2038

Change in number of families, medium projection

Family numbers and type, Ashburton District Medium projection, 2013(base)–2038

■ Couple-without-children ■ Two-parent ■ One-parent

Source: Environment Canterbury Regional Council, Statistics NZ

Welcoming migrants

The Council already does well in the development of events and programmes to support the integration of new migrants. Ashburton is considered a welcoming place for new migrants, with recognition that the district is becoming increasingly multi-cultural.

There should be further development of initiatives to support the diversity of Ashburton, with events held in community halls to introduce newcomers to the district and introduce them to a support network. Successful integration of migrants will increase the chances they stay on in Ashburton and continue contributing to its labour force.

Regular Council communications, for example, an updated page on its website profiling newcomers to Ashburton, will help to enhance the unders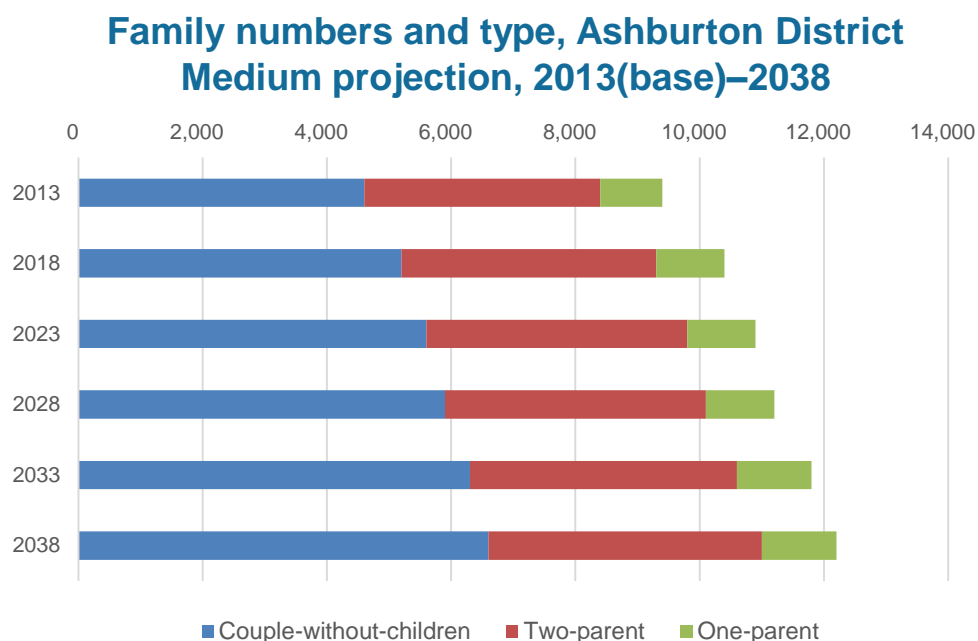tanding of new migrants and their motivation for living in the district. This would help to promote positive interactions between Ashburton residents and new migrants.

A positive reputation for welcoming migrants will also help to attract more migrants into the district in the future.

Promotion of Ashburton

There are many benefits to living in Ashburton, including its low cost of living, location close to the mountains, abundance of outdoor recreational activities, wide range of high quality eateries, and tight-knit community. However, the perception of Ashburton outside of the district is often very different.

The Council can put in place a campaign to promote the "Ashburton Story" to highlight these positive aspects about living in the district. There is a current Council webpage which outlines the key aspects of living in Ashburton[9] but there are opportunities to improve this page to promote the key attractions of the district.

The Council should also promote the ease of relocating or commuting to Ashburton. It could contribute to this by developing a programme where it provides in conjunction with businesses a subsidy for relocation to attract workers from outside the district.

The Council should develop on its website a portal for employers and jobseekers to advertise and look for jobs in Ashburton. This would improve the matching of skills in the district, and also increase awareness of the opportunities from living and working in Ashburton to those outside the district.

8.2. Businesses

Corporate code of responsibility

Businesses are hesitant to invest in the training and upskilling of staff, given the prevalence of poaching of staff from other businesses in the district. This leads to a short-sighted approach in the hiring of staff.

Businesses need to collaborate to develop a strong pipeline of workforce ready with the skills required for the jobs available.

Larger corporate businesses should be encouraged to have the social responsibility to train this pipeline of workforce and understand the long-term benefits to the Ashburton community, given they have the resources to develop a formal training programme. A code of responsibility should be developed with the Council and central government for key industries to outline how businesses will equip the workforce with the skills required.

For example, this code could outline how a large employer of transport workers will develop a structured programme of accredited training for particular types of drivers. This will discourage the short-sighted approach of companies waiting for another company to train up the workers before poaching them with a higher salary, which is detrimental to the long-term development of the Ashburton workforce.

Develop career pathways

Workers often leave their jobs because of a lack of career progression in the role. This means that to retain workers it is important to develop career pathways for them. Businesses need to work with the Council to create opportunities for cross-training so that workers can be exposed to different job functions (which may mean moving to another organisation) in order to progress in their career within Ashburton.

For example, the Council can collaborate with businesses to develop a jobs rotation programme where an entry level farm hand can move onto a career as a territory

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9   https://www.ashburtondc.govt.nz/our-district/about-ashburton-district/Pages/living-in-ashburton-district.aspx

manager and then regional sales manager, before becoming an agricultural consultant over many years. A structured programme where an entry level worker will be exposed to progression opportunities throughout the years will encourage workers to think about their career pathway within Ashburton.

By stepping back from the day-to-day operations of a business, the Council can help businesses to develop career pathways through identifying roles within Ashburton a worker can progress through, and at the same time improve the matching of roles to workers that have the required skills. This longer-term approach to upskilling of the Ashburton workforce would ensure a stronger pipeline of high-skilled workers.

Flexible working conditions

Businesses have to be willing to be flexible in order to hire the workers with the right skills required for the roles. This may mean businesses have to allow workers to work remotely outside of Ashburton.

Having more flexible working hours would also widen the pool of available workers, such as working mothers. Increased flexibility may mean the adoption of new technology such as software to allow workers to update deliveries online.

8.3.   Central Government

Immigration policy

Businesses highlighted immigration policy has a key influence on the extent of labour shortages in Ashburton. Migrants have helped to alleviate labour shortages in the district, but there is much room for improvement in immigration policy decision-making which would help ease the constraints of migrants trying to work in Ashburton.

This is where the Council can have an advocacy role in highlighting the needs of Ashburton to the Government, particularly the Immigration Minister.

The Council needs to work with the Immigration NZ to develop a regional skills shortage list to address the particular skills shortages which are specific to Ashburton. In addition, the Council should work with the Government to look for ways to minimise uncertainty for migrants looking to apply for a visa to work in Ashburton. Given the lack of certainty over the ability to convert a working holiday visa to a residency visa deters applicants from applying to work in Ashburton, transparency and efficiency in the process at the start would help to alleviate concerns.

The Council's role should be to increase awareness amongst the Government of the negative impact of migrants having to return home when their residency visa application is denied after companies have also invested in several years of training in them. This churn in an organisation's staff is disruptive to operations and damaging to profitability, as well as having a negative impact on the wellbeing of migrant workers.

Labour legislation

The Council should play an advocacy role when dealing with the Labour Minister so that the Government understands the implications of changes in labour legislation such as the abolition of the 90-day trial for businesses with more than 20 employees. In the absence of the trial, businesses are more hesitant to try out new workers, given concerns about the reliability of some parts of the domestic workforce. The abolition of the trial hinders the matching of workers to the jobs available given the reluctance for businesses to take on new staff.

School curriculum and training

Most jobs in Ashburton require a driver's licence. In particular, to be a truck driver as a school leaver would require the worker to have obtained a driver's licence by the time they are sixteen. This forward planning is only realistic for youth if such skills are part of the school curriculum. The Council should work with the Ministry of Education to incorporate into the Ashburton school curriculum essential skills specific for working in the district such as obtaining a driver's licence.

There is also the opportunity for the Council to collaborate with the Ministry of Education in developing broader apprentice schemes which will help to build a pipeline of workers with the right skills to work in Ashburton, such as on-the-farm training.[10]

8.4. Specific action points

Table 2 shows our recommendations for each key stakeholder group, and the role of the Council in facilitating these actions. To the extent that our modelling framework shows the key priority in improving the labour supply in a district is to maximise QL, this is the main criteria we use to support our policy recommendations for Ashburton. This is the area where the Ashburton District Council can have the most influence within the scope of its work.

For example, one of the factors determining QL is affordability of housing in a district. This does not refer only to the absolute value of house prices in Ashburton relative to the other districts, but how housing values compare relative to the amenities and facilities provided in each district.

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[10] https://www.tec.govt.nz/teo/working-with-teos/itos/new-zealand-apprenticeships/

Table 2 Labour Force Plan

Actionable policy recommendations

Policy lever group	Levers	Performance measures	Policy recommendation
Attraction (entry flow)			
Council	Place-making	Improve the QL ranking with other districts in New Zealand.	Audit of current recreational facilities and consider the feasibility of investment into new facilities as a potential application to the PGF. Focus the streetscape renewal project to attract higher rent tenants to the CBD, by prioritising designs which modernise shared spaces and improve accessibility for pedestrians.
Council	Young families	Increase the proportion of young families in the district.	Increase the amenities that will attract young families, including playgrounds and recreational facilities. Play an advocacy role in working with the Ministry of Education to improve the quality of early childhood and primary school education, as well as the level of after-school care. Promote through advertising campaign the benefits of settling down in Ashburton, including the low cost of housing.
Council	Welcoming migrants	Survey migrants on the QL in Ashburton, and how included they feel in the community.	Monthly events to welcome new migrants and encourage mingling with residents. Updated webpage on the Council website profiling migrants to show their motivation for living in Ashburton.
Council	Promoting the Ashburton Story	Survey New Zealand residents across the country on their perception of Ashburton as a place to work and live.	Advertising campaign (which is maintained and refreshed annually) highlighting the benefits of living in Ashburton. Updated webpage on the Council website to promote the key attractions of Ashburton.

Policy lever group	Levers	Performance measures	Policy recommendation
Government	Immigration	Number of migrants moving into Ashburton – by visa type. Number of migrants leaving Ashburton because their visa has expired.	Council needs to highlight the need for migrants in Ashburton to alleviate labour shortages. Council to lobby Government for a regional skills shortage list specific to Ashburton. Improve transparency and efficiency in the process, so overseas applicants have a clear idea at the start of the chances of staying in Ashburton.
Retention (exit flow)			
Businesses	Corporate code of responsibility	Measure the number of people trained under the corporate programme and stay working in Ashburton.	Large corporate organisations develop a structured programme of industry accreditation to train its own pipeline of workers.
Businesses	Career pathways	Measure the number of new hires in Ashburton which are promoted from within the district	Develop a cross-training programme to give workers opportunities to progress their career within Ashburton. Develop and promote career pathways in industries, to motivate workers to stay in Ashburton.
Businesses	Flexible working conditions	Measure turnover of workers in Ashburton	Develop ways for workers to work remotely, so that location and working hours can be flexible.
Matching (stock)			
Council	Improve efficiency of recruiting in Ashburton	Measure the vacancy rate in Ashburton relative to its unemployment rate.	Central portal for businesses and jobseekers to advertise and look for jobs in Ashburton.
Government	Labour legislation	Measure change in new hires before and after legislation change	Council to work with industry groups to lobby Government to reinstate 90-day trial.
Government	School curriculum	Measure the proportion of driver licences attained at each age group Number of apprentices trained under the scheme and working in Ashburton.	Council to work with Government to incorporate driving skills and attainment of a driver's licence into the school curriculum, to ensure they are ready to work in Ashburton. Develop broader apprentice scheme to build pipeline of workers

Source: NZIER

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Appendix A Methodology for estimating labour force gaps

The observed level of employment is equal to the equilibrium reached between observed supply (S^o) and observed demand (D^o). The information included in observed equilibrium however excludes any information about the number of jobs that *could* have been filled if there had been enough supply of labour.

This unobserved level of supply and demand is *the counterfactual* that we need to understand in our analysis of the labour shortage.

The difference between observed (S^o) and unobserved (S^u) supply of labour is the shortage of labour that dampens economic growth.

Workers are mobile between regions. In their choice of location, a mobile labour force faces a trade-off between work and life quality (see, for example, Maré, Grimes, Donovan and Preston (2018)).

There is an established literature on the drivers of migration. In their seminal study, Blanchard and Katz (1992) discuss the drivers of domestic migration using U.S. data for 1947-1990. Using regression analysis (VAR models) their results suggest that unexpected movements in employment are caused by shifts in labour demand rather than by shifts in labour supply, i.e. they introduce job location as the driver of households' choice of location.

To understand the lack of labour supply, we first try to understand the desirability of working in a district. Our approach is based on one proposed by Chen & Rosenthal (2008) and recently adopted by Maré et al (2018) in New Zealand.[11] As stated by Maré et al. (2018) the approach implies that:

> *A place with high rents but low wages must have amenities that make it a nice place to live otherwise people would move elsewhere & newcomers would not arrive ("sunshine wages")*
>
> *And,*
>
> *A place with high rents and high wages must have amenities that make it a good place to do business otherwise firms would move elsewhere & new firms would not be established ("productive")*

Using this method, we construct indicators for the Quality of Business (QB) and for the Quality of Life (QL). QB relates to the attractiveness of doing business in an area, while QL relates to the attractiveness for residents to live in an area.

Both QB and QL are constructed based on housing costs (rents) and wages. For QB, we use a weight based on the substitution between labour and land for the regional industries. This implies that industries use a proportion of land versus labour for the

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[11] The results of the New Zealand study are not published yet. While in this report we use a similar method for understanding the QB and QL, our sources of data and the granularity of data are different from Maré et al. (2018). Also, while Maré et al. (2018) are mostly focused on understanding the factors affecting QB and QL, we are mostly focused on understanding the effects of QB and QL on labour supply.

production of their products and a quality of business indicator need to account for that. For QL, we apply a weight of the substitution between housing and non-housing consumption. This implies that households choose between the share of housing in their expenditure basket. Hence, in our understanding of the quality of life, we need to understand the importance of housing to households.

We adjust wages for the households' economic compositions in different districts, such as age, gender, ethnicity and qualification. Also, the rents are adjusted for the features of housing, including number of bedrooms, dwelling type, and the available heating types. This provides a more consistent indicator for comparisons across districts.

Figure 21 illustrates average rents for Ashburton, Selwyn, South Waikato, Timaru and New Zealand. As illustrated, in 2015, rents in Ashburton are higher than most places with similar economic compositions, i.e. the districts with similar shares of different sectors in their economy – for example, districts with high concentration on agriculture. Higher housing costs in Ashburton will increase economic stress for the residents and impose extra costs on businesses who are competing with other districts for workers.

## Figure 21 Average rents, 2000-2015
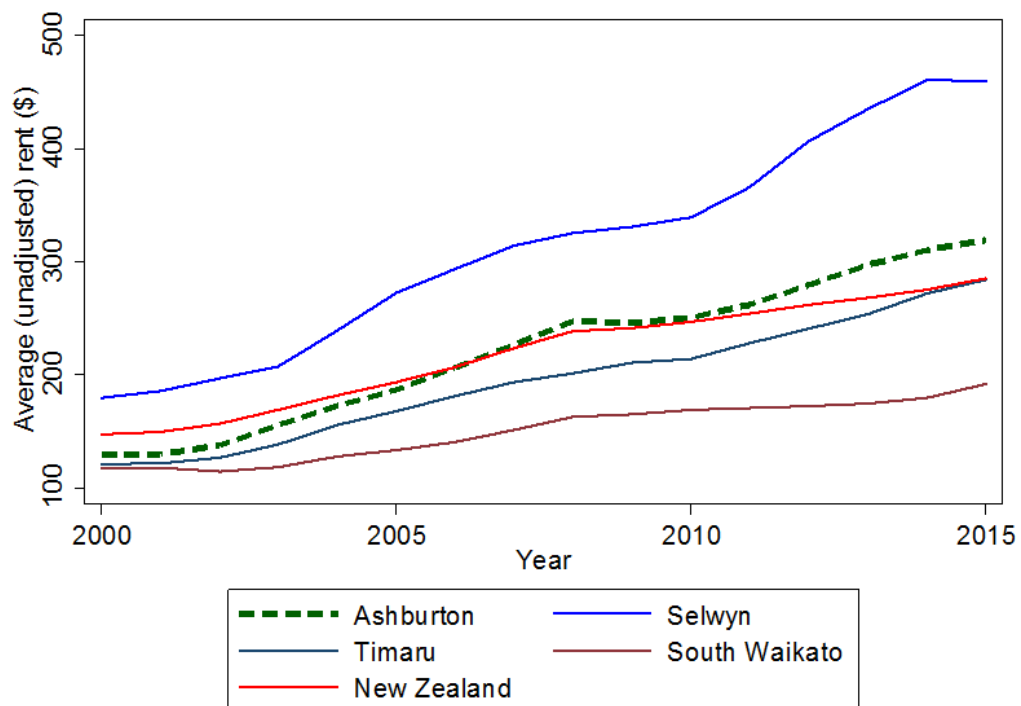
Source: NZIER (2018)

Median wages for new jobs are illustrated in Figure 22. In comparison with districts with similar economic composition, Ashburton provides relatively high wages. This, however, needs to be adjusted for the features of labour that each district demands – as we do in our estimation of quality of life and quality of business indicators.

Figure 22 Median wages for new jobs, 2000-2015
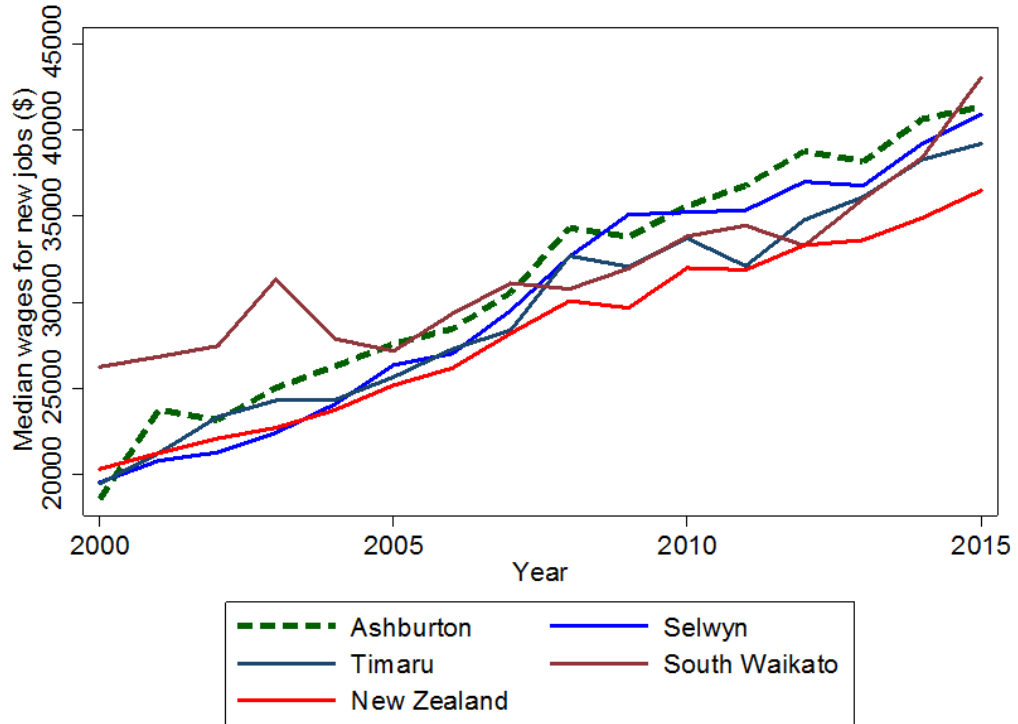
Adjusting for wages and rents

We first adjust wages for the households' economic compositions in different districts, such as age, gender, ethnicity and qualification. Also, we adjust rents for the features of housing, including number of bedrooms, dwelling type, and the available heating types. This provides a more consistent indicator for comparisons across districts. For adjustment, we use log-linear regression:

$$\ln\left(y_t^d\right) = \beta_0 + \beta_1^v . V_t^d + \varepsilon_t^d \tag{1}$$

Where, y_t^d is the output (rents and wages) at year t in district d; and β_1^v captures the relationship between the output and a vector of explanatory variables for district d at year t (V_t^d); and ε_t^d is the random error term.

Estimating Quality of Business and Quality of Life

Then we construct measures of quality of life (QL) and qualify of business (QB) based on the adjusted wages and rents:

$$QB_t^d = \theta . \ln\left(r\_a_t^d\right) + (1 - \theta) . \ln(w\_a_t^d) \tag{2}$$

$$QL_t^d = \alpha . \ln\left(r\_a_t^d\right) + (1 - \alpha) . \ln(w\_a_t^d) \tag{3}$$

Where QB_t^d and QL_t^d are respectively quality of business and quality of life in district d at year t; $r\_a_t^d$ is the adjusted rent (derived from equation 1); θ is the substitution between land and labour[12]; α is households' substitution between housing and non-housing consumption.

For understanding the impact on employment, we use a fixed effect model. This controls for the (intrinsic) features of district – such as their natural endowments:

$$\ln(emp_t^d) = \vartheta_0 + \vartheta_1 . EV_t^{d,v} + \vartheta_2 . EV_{t-1}^{d,v} \times QB_{t-1}^d + \vartheta_3 . EV_{t-1}^{d,v} \times QL_{t-1}^d \qquad (4)$$
$$+ \vartheta_4 . QB_{t-1}^d + \vartheta_5 . QL_{t-1}^d + \mu_d + \epsilon_t$$

emp_t^d is the employment in district d at year t; EV_t^d is a vector of economic variables (v), including the employment of manufacturing, primary industries and services sector in district d at year t (we include three lags of the variables); ϑ_2 captures the changes in employment for different levels of economic activity when quality of business changes; ϑ_3 is the changes in employment for different levels of economic activity when quality of life changes; ϑ_4 and ϑ_5 capture the changes in employment as a result of a change in the previous years' QB and QL, respectively; μ_d captures the districts fixed effects and ϵ_t captures the time effects.

To understand the counterfactual, we investigate the impact of the share of different sectors in the economy on employment. This will provide us with an understanding of the (range of) employment expected for a district based on its economic composition. Accordingly, we estimate the maximum level of employment expected for Ashburton.

Our forecasting method

Future land demand is the combination of the likely future growth of different industries across sub-regions, which will be derived from NZIER's Sub-Regional Industrial Growth Model (SIGM), and the demand of different economic activities for different types of land, from NZIER's Sub-regional Location Choice Model – SLCM.

We overlay the predictions provided by NZIER's models (SLCM and SIGM) with our hedonic model of business land demand to provide precise predictions of future demand for business land.

Our SIGM model projects economic activity (output and employment) for 14 economic sectors, including the business categories, namely industrial, retail, office and other commercial, for the next 30 years, at the area unit level.

The model is based on:

- Household composition (age, income)

- Employment and job locations

- Migration (inflows and outflows separately)

- Spatial relationship (spill-overs) across suburbs

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[12]   Firms use (mobile) labour and (immobile) land to produce a product.

- Disaggregated relationships for different sectors: agriculture, other primary, manufacturing, wholesale, retail, accommodation and food services, transport, financial services, rental, professional, public, education, health, others.

Less sophisticated forecasting models will tend to drive future economic activity by sector solely off historical trends. This is problematic because when we are looking out 10 years, historical patterns are unlikely to hold true (e.g. automation is changing the manufacturing sector in ways that we have never seen before).

Appendix B Estimated labour shortage

Table 3 contains information on our estimated labour shortage for different economic sectors in Ashburton between 2015 and 2030.

Table 3 Estimated labour shortage for different economic sectors

| Year	Manufacturing	Primary industries	Services	Total
2015	120	151	207	478
2016	118	148	206	472
2017	119	154	214	487
2018	121	159	223	503
2019	122	159	229	511
2020	123	162	234	519
2021	124	164	239	527
2022	125	166	244	535
2023	125	168	249	542
2024	125	169	252	546
2025	126	171	256	553
2026	126	172	260	558
2027	126	173	264	564
2028	127	174	268	569
2029	127	176	273	577
2030	129	180	280	589

Source: NZIER (2018)

Appendix C Canterbury labour market indicators

Our own datasets provide unique insights into the Canterbury region. For example, our *Quarterly Survey of Business Opinion* (QSBO) shows that while Canterbury businesses report slightly less difficulty in finding skilled labour relative to businesses in other regions, the shortage of skilled labour in Canterbury is still acute and has been for a long time.

Figure 23 NZIER QSBO ease of finding skilled labour

% of firms surveyed
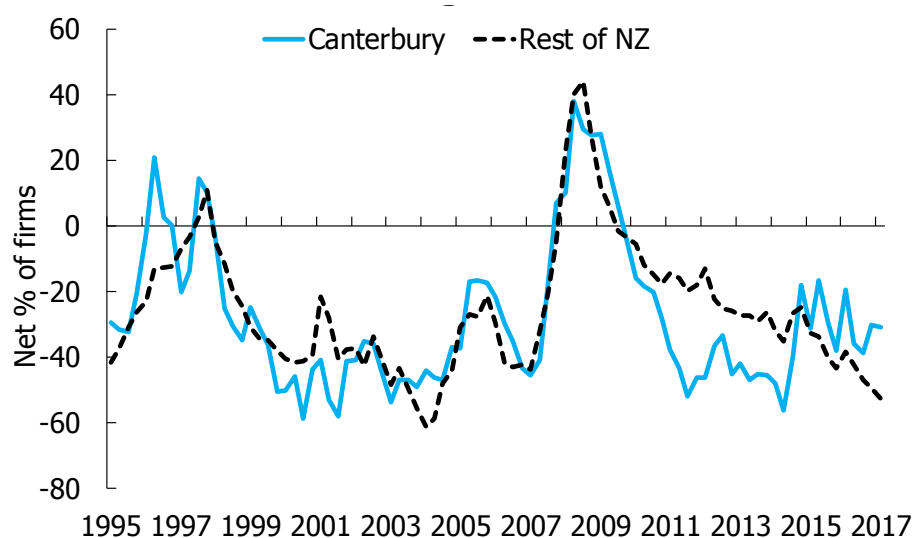
There is some indication that while the Canterbury labour market is constrained by shortages, it is relatively efficient in matching demand and supply of skills *if* the supply of labour is there.

The Beveridge Curve is a good indicator of quality of the skill matching within a labour market (Abraham & Katz, 1986; Blanchard & Diamond, 1989). The Beveridge Curve shows the relationship between unemployment and the job vacancy rate, i.e. the supply and demand for jobs. A higher rate of unemployment is typically related to a lower rate of vacancies.

Since late 2007, Canterbury has typically had a lower Beveridge Curve than New Zealand.

For a given vacancy rate, the Canterbury unemployment rate tends to be lower than the national average, suggesting that the Canterbury labour market performs better than the national economy in matching the supply of and demand for labour. This suggests that, in terms of search and matching process, skill matching in the

Canterbury labour market is somewhat better relative to the overall New Zealand labour market.

The most recent data on labour market matching (taken at June 2015) places Canterbury much higher than the national average in the top left-hand corner, i.e. high vacancy rate with low unemployment (below 4%, which is considered full employment). This outcome reflects the labour shortage felt in Ashburton and also Canterbury more generally.

Figure 24 Beveridge Curves for Canterbury and New Zealand[13]

Quarterly; Sept 2007 to June 2015
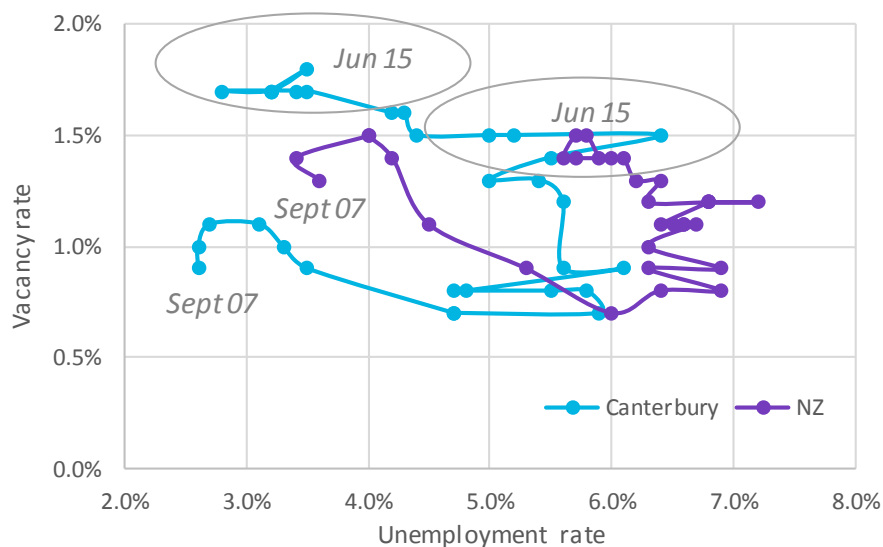
The question about the matching of the supplied skills to the (required) demand for skills needs to be assessed more carefully. We will discuss this in Section 3.

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13 http://www.mbie.govt.nz/info-services/employment-skills/labour-market-reports/jobs-online/special-feature-beveridge-curve-in-new-zealand

Appendix D Stakeholder engagement

We would like to thank the following organisations and associations for taking part in interviews and workshops to help us get a better understanding of the Ashburton labour market.

Ashburton Accord

Ashburton District Council

Business Mid Canterbury

Dairy NZ

Midland Seeds

Personnel Placements

Talley's Group Limited

Three Rivers Health

Wilsons Transport