



Invercargill city centre redevelopment

Implications for Invercargill and Southland

NZIER report to HWCP Management

March 2019

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Authorship

This paper was prepared at NZIER by Chris Nixon and Laëtitia Leroy de Morel

It was quality approved by Mike Hensen.

The assistance of Sarah Spring is gratefully acknowledged.



L13 Willeston House, 22-28 Willeston | PO Box 3479, Wellington 6140

Tel +64 4 472 1880 | econ@nzier.org.nz

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Key points

Revitalisation of the city centre is a \$180 million catalyst for further growth

HWCP Management is seeking funding from the Provincial Growth Fund (PGF) to establish developments which would act as a catalyst to attract long-term private investment. The key investment is the **\$180 million revitalisation** of Invercargill's city centre as a way to:

- attract business and local shoppers back into the central city
- breathing life into the city and providing the commercial sector confidence in accelerating investment in Southland
- improving liveability and local businesses ability to successfully recruit and retain staff in the region
- act as a gateway to the region for the growing tourism numbers.

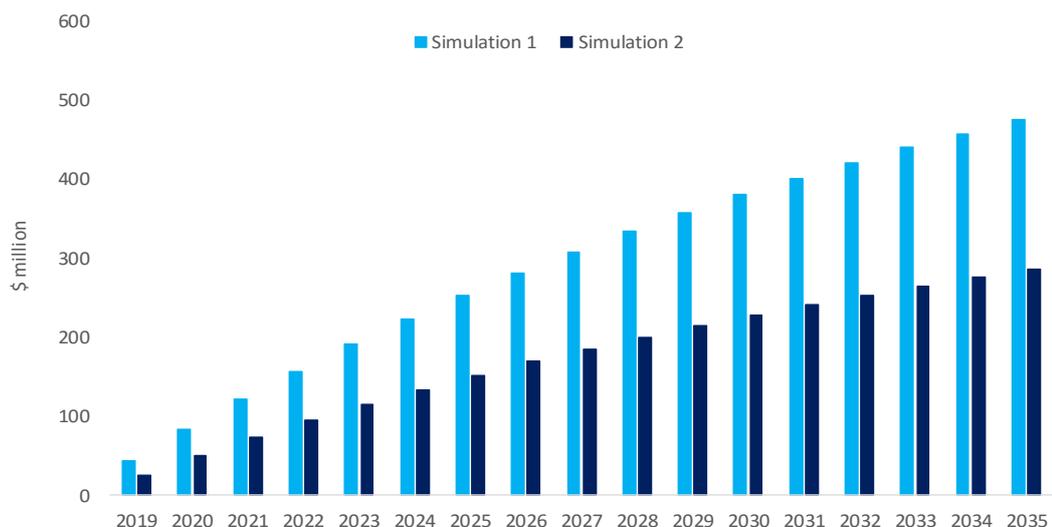
A further \$118 million in retail spending is contingent on stage one going ahead (specifically retail and food and beverage investment).

Southland's real GDP would increase by between \$286m (sim 2) and \$475m (sim 1) in the period 2019 - 2035

- Figure 1 shows the cumulative impact on real GDP for the period 2019-2035 of the investment.

Figure 1 Cumulative redevelopment impact on real GDP

Total cumulative impact out to 2035, in \$ million; Net present value (at a 6% discount rate)



Source: NZIER

The direct and flow-on effects of increased investment, tourism spending, and employment at the regional level are significant

- Southland’s real GDP increases by \$48 million (0.84%) per year and real household spending increases by \$44 million (1.17%) per year.
- supplying industries in the Southland economy are positively affected by an increase in investment, tourism spending and employment. Output of Southland industries is expected to increase annually by \$75.2 million and \$32.9 million under simulation 1 and simulation 2, respectively.
- industries such as food and beverages, accommodation, retail, sports and recreation expand because of the increase in tourism spending stemming from the redevelopment of Invercargill’s city centre.
- also, higher incomes for households lead to increased spending in industries such as other personal services, retail and real estate services.

The economic impacts at the national level

- national macroeconomic effects are driven by the growth in Southland as the region imports most resources it needs from the other regions.
- New Zealand’s real GDP rises by \$63 million (0.02%) and \$49 million (0.02%) per year on average, under simulation 1 and simulation 2, respectively.
- national real household consumption also benefits through slightly higher real wages. Table 1 presents our high-level results for our two scenarios.

Table 1 Summary of macroeconomic impacts

Change from baseline (2018), in percent and in \$ million (real terms)

Region	Redevelopment simulation		GDP	H/hld consumption	Wages	Exports	Capital stock
Southland	Sim 1	% change	0.84%	1.17%	0.59%	0.40%	1.04%
		Level (\$m)	\$48	\$44	NA	\$14	\$22
	Sim 2	% change	0.51%	0.95%	0.48%	0.36%	0.57%
		Level (\$m)	\$29	\$36	NA	\$13	\$12
New Zealand	Sim 1	% change	0.02%	0.04%	0.05%	0.00%	0.02%
		Level (\$m)	\$63	\$61	NA	\$2	\$27
	Sim 2	% change	0.02%	0.03%	0.05%	-0.01%	0.02%
		Level (\$m)	\$49	\$56	NA	-\$5	\$19

Source: NZIER

Invercargill's city centre redevelopment will generate jobs

The redevelopment of the city centre will:

- create between 500 and 550 per annum temporary construction jobs over the five years of the rebuild
- increase visitor spend for tourists incrementally above what would already have come to the region. We have assumed incremental growth of 5% per annum
- create a more liveable city that we expect will contribute to the target of increasing the permanent residents in the region by 10,000 (simulation 1) and 3,000 (simulation 2). This creates:
 - Approximately 8,000 working age people in simulation 1 over the period due to an increase in retail and tourism jobs
 - Approximately 2,400 working age people in simulation 2 over the period due to an increase in retail and tourism jobs
 - 300 of these jobs are likely to be taken up as a result of the rebuild in Invercargill

Indirect spending will be higher in Southland because of the higher than average household income and lower cost of housing relative to other New Zealand cities.

The redevelopment is required because of the current state of the city centre and the inability of Invercargill to retain and attract further businesses and tourists (and increase the spend of tourists in Southland).

The impacts are likely to be shared evenly over the forecast period

- Invercargill is likely to experience GDP growth early because of the physical impact of the rebuild
- Southland other than Invercargill will benefit more from the larger influx in tourists
- The GDP impact is likely to balance out over time.

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1. Scope and approach

HWCP Management and other stakeholders want to understand the potential impact on Southland of the redevelopment of Invercargill’s city centre.

The purpose of this report is to:

- Ask what the potential of the redevelopment of Invercargill’s city centre will be
- Set out the “size of the prize” if the redevelopment was successful.
Specifically:
 - The impact on the CBD from the temporary building activity associated with the redevelopment
 - The potential impact on Invercargill by making it a more attractive place to live and do business
 - The potential to increase tourist spend and possibly the number of tourists coming to Southland (over and above the business as usual scenario)
- Set out what needs to be considered to make the redevelopment successful (and potential well-being impacts).

The following diagram set out the approach taken.

Figure 2 Steps to understand the impact of PGF’s net contribution



Source: NZIER

We have drawn on information from international and domestic sources, case studies of city centre redevelopments in New Zealand and overseas, information from SoRDS and HWR, and perceptions from those who have experience in redevelopment.

The main drivers of the opportunity are:

- an acceptance that current commercial offerings in Invercargill are not attracting business and visitors (a burning platform)
- the buildings of Invercargill’s central city are in a rundown state and present a seismic and social risk
- the expected influx of tourists (domestic and international) will keep increasing and presenting Southland with further opportunities

- the willingness of the Southland community to be proactive.

The analysis is intended to give decision-makers an initial indication of the likely benefits, the potential of the redevelopment to be a catalyst for faster growth, and consideration of the preconditions of success.

This is an initial report and as such its depth reflects the scoping nature of the assessment. A further in-depth analysis will be required to uncover any obstacles, strategies and tactics to overcome those issues.

1.1. Current situation

A number of documents highlight the current state of the Invercargill's central city.¹

The stylised facts are set out in "Our City for Tomorrow" include:

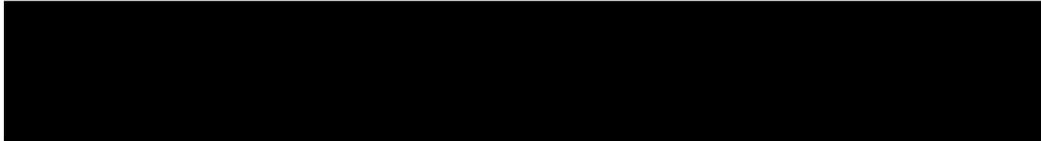
- Many of the buildings in the city centre have significant seismic risks and there is an unwillingness to invest money in rehabilitating these buildings by owners:
 - Buildings have asbestos which needs to be removed
 - The majority are untenanted due to existing risk
 - Buildings are in such a state that they may have to be demolished within one or two years and there the status quo is not an option
- A lack of reinvestment in CBD properties and few contemporary amenities for a growing number of tourists. This precludes the city from capitalising on the tourist growth and missing out on opportunities to increase the spend per visitor in Southland
- The lack of central city "heart" that attracts people into the city for work. An objective of the region is to increase the number of working age people in Southland. To attract staff requires having the urban infrastructure and lifestyle to support their needs and their families
- The potential for losing further businesses has increased with the increasing difficulty in attracting highly qualified staff and their families to live in Invercargill
- The sprawl associated with the retail sector. This may reduce the ability of Invercargill to revitalise the region, reduce the potential for vitality and viability by not being able to attract new businesses, and reduce economic resilience.²

The importance of city "liveability" is critical and one of the main motivating factors behind the CBD redevelopment.



¹ See for example <https://hwcp.nz/faq/>

² See for example <https://journals.openedition.org/sapiens/1620>



1.2. Is this the right time for a major development?

It is always difficult to speculate on the best time to invest in a major project such as the redevelopment of the CBD. Further it is not the role of this paper to give a firm yes or no to the project. There is always uncertainty about whether or not a development will be a “success” or not.

However, there are pointers to decisionmakers on the degree of uncertainty associated with the development. Below we look at some of these issues.

The current state of the New Zealand economy. Between the period 1975 -2002 the New Zealand economy grew by 1.9% per annum. In this period of low growth infrastructure projects were hugely costly if you got them wrong – essentially they were not used and ended up as debt that didn’t pay its way.

In the period between 2000 and 2018 the average growth rate have been 3% (March year) real according to the Reserve Bank. Therefore, growth has been significantly higher and the degree of economic activity. This means the appetite for infrastructure project is higher than it was 20 years ago.

It does not guarantee success of any particular project but it does mean that there is a reduction in uncertainty associated with infrastructure development. This has been reinforced by the reduction in the discount rate applied to building projects by Treasury.

Table 2 Comparison between eras

<Heading>	Real GDP growth rate	Government discount rate for investment in building infrastructure	Comment
1975 – 2002	1.9%	10%	Government used 10% to choke off investment projects
2000 – 2018	3.0%	6%	As the economy has grown government discount rates have reduced

Source: Briggs (2003) and Reserve Bank data <https://www.rbnz.govt.nz/statistics/key-graphs/key-graph-real-gdp>

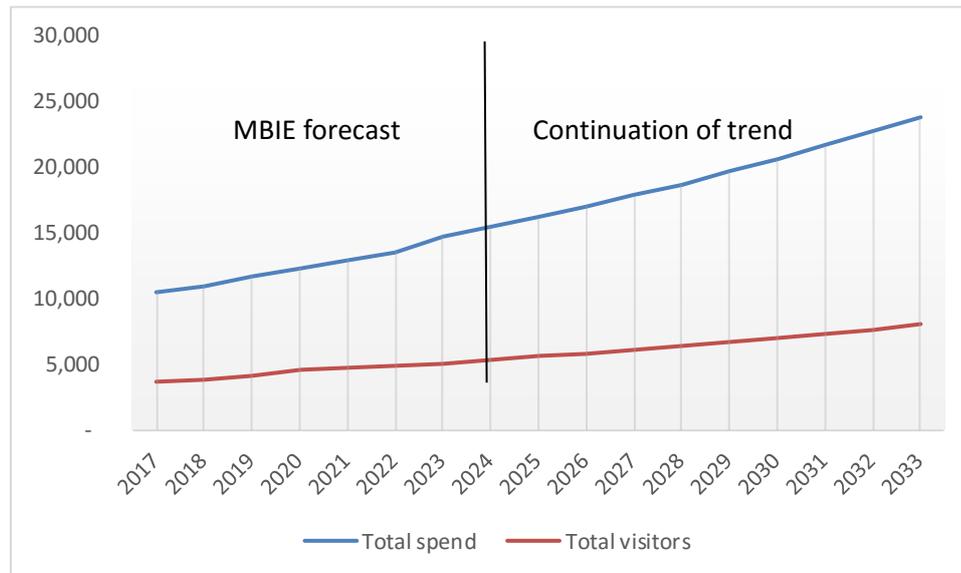
A further issue is the growth in tourism numbers. The number of tourists coming to New Zealand has more than doubled since 2000³. It is now bigger than the dairy

³ Statistics NZ Satellite Account 2016.

industry at the farm level. Further MBIE forecast that tourism spending will increase by approximately 5% per annum until 2025 (see Figure below). By 2030, if these rates persist then tourism numbers will double to well over 4 million per annum. Projects that can capitalise on increased tourism will reduce uncertainty.

Figure 3 Total tourist numbers and spend projections

2017 – 2033



Source: MBIE <https://www.mbie.govt.nz/info-services/sectors-industries/tourism/tourism-research-data/international-tourism-forecasts/documents-image-library/nz-tourism-forecasts-2018-2024-report.pdf>

Should Invercargill adopt a wait and see approach to further CBD development? This seems a prudent step since all investment has a degree of uncertainty. A number of points need to be considered:

- The risk and uncertainty associated with projects like the CBD redevelopment has reduced since 2000 as growth has increased
- The number of tourists has grown considerably with Southland experiencing a growth rate well above the national average
- The current state of the CBD and whether there is capacity for Invercargill to assist in sustaining those growth rates
- Whether rate payers are prepared to take on the risk and uncertainty that a partly funded \$180 million CBD redevelopment require
- The substantial risk of doing nothing.

1.3. Oversupply of retail space

The oversupply of retail space is a fact of life for a large number of towns and cities within New Zealand. This could be an argument used to counter the need for Invercargill city rebuild since it could create a greater oversupply.

There will be an oversupply of retail space whether the CBD redevelopment occurs or not. This is because:

- The rise of the internet and the continually changing ways we are using both the internet and bricks and mortar retailing
- Sales seemingly being a permanent feature of the retail landscape – unheard of twenty years ago
- Purchasing power is growing as goods become cheaper and cheap credit is available
- Empty shops in most New Zealand ‘main streets’ – many of which will not be filled because they are not suited to new retail business models
- Competition for the retail dollar including cheap air travel. Many people shop in other countries for consumer items
- Customers knowing more about specific goods and services than those doing the selling.

The main economic argument is that while there is an oversupply of retail space there is a shortage of good quality sites. This means that:

- Where there is an oversupply of sites councils attempting to dictate where large retailers should locate are unlikely to be successful. So the central city is likely to remain the way it is “without the CBD development” and possibly lose more retailers to other parts of Invercargill city
- Retailers have specific requirements that need to be met before they will invest for 15-20 years. These are mixture of macro (income and population) and micro (traffic volume, visibility, parking) factors that dictate where they locate. The degree of competition may or may not be a factor in a location matrix

Therefore, arguments that Invercargill has enough retail space are not likely to attract major retailers into the city centre in its current state.

These shopping trends are going on regardless of the CBD redevelopment proposal. The type of properties, the location, and the way the customer interacts with business are changing dramatically. Furthermore, we have no idea when this “churn” will end or who the retail winners will be. What we do know is that it has not stopped; and more disruption is on the way driven by technology. We also know that there is keen competition for quality retail sites.

The following Table sets out the latest trends associated with quality shopping centres in New Zealand with supporting evidence from Australia. It highlights the strong growth in sales from these shopping centres which indicates a shortage of supply in this type of shopping experience.

Further, the expected value of increasing the quality of retail space is set out in a separate report.⁴ It forecasts that the potential for the redevelopment looking at food alone is \$31.8 million in 2021. Some of this potential spend is likely to be new spending that would not have otherwise been spent in Invercargill or Southland.

Table 3 Summary of recent trends in quality shopping centres

Latest report¹

Colliers International comment
Shopping Centres in Auckland, Wellington, and Christchurch have seen significant sales over the past 12 months
There is a strong trend towards food and beverage (F&B) sales. In many malls F&B is between 20% and 40% of retail space. They are the anchor stores and are a major feature of the proposed Invercargill CBD redevelopment
Globalisation is still having an impact with new offshore retailers heading for New Zealand.
Trends in Australia are similar. In Victoria, sales in shopping centres have risen 91% in the last year
75% of shopping centres in New Zealand are expecting to meet or better their targets in 2019. Sales are likely to run ahead of inflation
Strong visitor numbers are boosting retail sales
Shopping centres are evolving to meet customer demand with free Wi-Fi and automatic retail lanes
Notes (1) https://www.colliers.co.nz/news/2019/2019%20commercial%20property%20review%20-%20new%20zealand%20retail%20market/ https://www.colliers.co.nz/find%20research/retail/new%20zealand%20retail%20report%202017/

Source: Colliers International Market report 2019

⁴ Future food (2019) Invercargill central. Food and Beverage Masterplanning. Report commissioned by HWCP.

2. Redevelopment as a catalyst

The redevelopment of Invercargill's city centre reinforces the region's efforts to build new opportunities by improving the office and retail space available and capitalise on a continuing tourism boom.

Southland has a strong agrarian heritage and is attempting to diversify its economic base by capitalising on a continuing tourism boom in New Zealand.

The rationale for taking this approach to economic development is that the redevelopment:

- has a major impact on the places where we live, work and play. Putting vacant or abandoned buildings and land back into productive use is a major tool of economic development. This helps keep businesses located in urban areas where service infrastructure capacity and business activity are already concentrated
- retains and attracts talented people. Communities that provide quality jobs and great places to live and work are a magnet for folks of all ages. As a result, these places have a strong future
- fosters the entrepreneurial spirit that resides in our creative and ambitious citizens. By providing access to ideas, investment and expert advice new companies can be created to help assure Southland's economy stays innovative and diverse
- acts as a gateway for tourism in the region
- further enhances its educational facilities to attract more students and bring them into a more vibrant city centre.

2.1. The redevelopment must augment Southland's competitive advantage

As the only city in Southland, Invercargill is the commercial hub for the region and it services the economic, social, and political needs of the region. Invercargill needs to respond to the changing needs of the region and promote further economic activity where opportunities arise.

The redevelopment provides an opportunity to reinforce the existing competitive advantages that agriculture has provided and diversify the regions areas of comparative advantage into new such as tourism.

Cities centres need the right amount and quality of office, retail, commercial and residential space to support and meet the demands of businesses, residents and shops. Improving the quality of areas designed for social interaction, in combination with other interventions, will help make city centres more attractive places to do business. A high-quality offering is likely to have a positive effect on levels of investment, land values, tourism, and productivity levels via a healthier and more satisfied workforce.

This can be done by providing:

- up-to-date offices for branch and head offices located in Invercargill and to attract further business
- a gateway to the region for visitors – either as a jumping-off point for one of the southern hemisphere’s great wilderness regions with Stewart Island, The Catlins, and Fiordland or to experience the range of world-leading transport attractions in Invercargill itself
- jobs for the initial redevelopment and further ongoing employment that can act as a catalyst for further employment and growth.

The redevelopment is an opportunity to improve the region’s physical infrastructure in a way that supports Southland’s existing competitive advantage and extend it into other areas as the opportunities arise.

The plan to redevelop the CBD will have a number of stages. The first three stages consist of:

- The demolishing of 30 buildings in the Esk, Dee, Tay and Kelvin street block
- The construction of retail
- The construction of:
 - The HWR offices (\$25m)
 - A medical centre (\$20m)
 - Commercial offices (\$18m)
 - Kelvin/Tay Hotel (\$40m)
 - ICC associated works broader environ(\$20m).

The third stage is contingent upon the demolition stage.

2.2. Recognise the value of existing resources

Physical infrastructure redevelopment is a supply-side measure, and therefore should be considered alongside the potential demand for the infrastructure. It is also important to provide appropriate space without creating an oversupply. However, providing appropriate higher quality physical environments, such as up-to-date office stock or housing, can contribute to attracting businesses, residents and visitors to the city centre.

Therefore, the project must be viewed within the context of its connection to surrounding developments and expected business activity, i.e.:

- increased tourism numbers and repositioning of Invercargill as a gateway to the region
- increased ability to retain and attract further business activity (across the spectrum of economic activity with the redevelopment).

2.3. Building effective partnerships

The redevelopment is designed to contribute to and further support increased economic activity in the region. This requires mutually reinforcing investments that can support economic expansion.

The city centre redevelopment can assist this process by making it easier for other businesses to relocate or remain in Invercargill and support the growing tourism industry. This can increase jobs and further encourage businesses to locate in the city and region. The redevelopment's role as a catalyst therefore is important since it assists in creating growth which in turn creates further growth through independent action.

This type of development can drive further business activity and increase spending over and above what would occur 'without' regeneration. While nothing is certain, where business, regional government, local government, and Ngāi Tahu have been aligned and focused on these issues, it maximises the chances of not only achieving their goals but also the chances of further success.

3. The mechanics of being a catalyst

The redevelopment of Invercargill's city centre is designed to be a catalyst to encourage further investment and economic activity to the city. The aim is to “lift all boats” on a rising tide of economic activity that would not otherwise occur within Southland. In particular:

- improving the quality of retail space where Southlanders can live, work, and play. The demonstration effect of providing a quality retail space is aimed at encouraging further businesses investment
- providing quality places to live and work attracts and retains people in Southland. This in turn improves the chances of enhancing innovation
- improves the chances that tourist will stay longer and spend more relative to the current dilapidated central city retail offerings
- encourages more interaction between educational facilities and the central city. A more connected and vibrant city centre is likely to generate more opportunities.

As a catalyst the aim is to trigger further independent action by businesses and others to increase the wellbeing of Southlanders. The opportunity for this action comes about through:

- the need to renew the city centre as the needs of the Southland population changes
- taking advantage of new opportunities such as tourism (forecast to double by 2030) along with Tourism New Zealand's strategic priority one, “to broaden our measure of value from near-term growth to long-term sustainability achieved with a key focus on greater regional dispersal of visitors beyond the main visitor destinations
- increasing economic activity to increase the number of durable jobs in the region.

Figure 4 sets out the business and aggregate impacts and illustrates where developing new economic activity impacts on wider Southland priorities. This involves detailing the potential impact of the city centre's redevelopment. It sets the scene for potential growth and details the investments required to reach those growth levels. It provides a way of organising the project and capturing the diverse economic and social impacts.

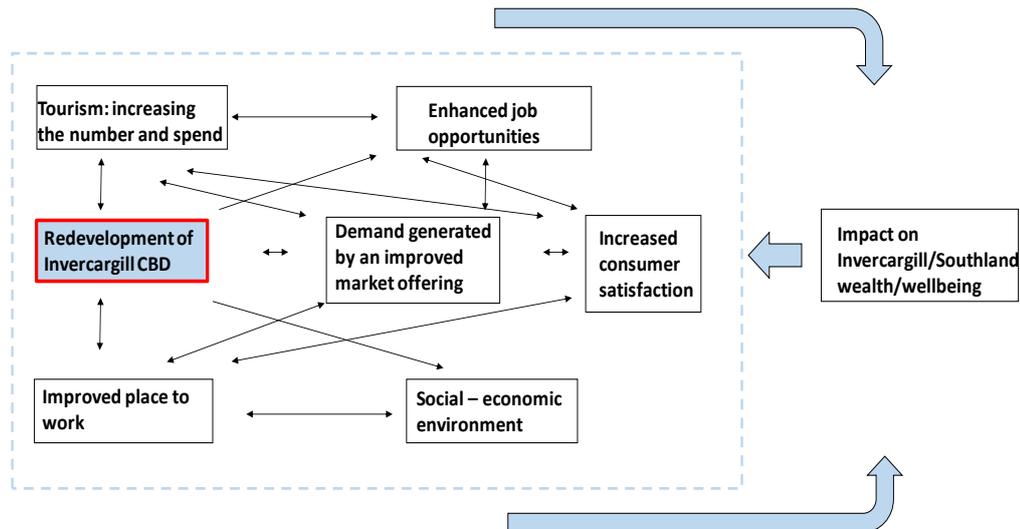
The diagram shows that there is no one path to wealth creation. Innovation can come from anywhere, hence the focus on the redevelopment as a catalyst rather than the sole source of growth.

The model allows a better understanding of what creates and destroys wealth in a community i.e. what creates wealth reinforces and builds upon the soft and hard

infrastructure. It can show the differing objectives of single entities and communities and how those differing objectives can impact on community goals.⁵

However, to maximise the chances of success what is required are strong linkages between parts of the social infrastructure in Southland and the businesses that they are trying to foster. The strength of the connections will be key to the success of the redevelopment's impact on Invercargill and Southland.

Figure 4 Framework for thinking about innovation



Source: Adapted from Swann (2016)

Figure 4 concentrates on the interaction between the various elements that connect with the city centre redevelopment of Invercargill. The importance of the strength of the linkages, in specific cases, depends on the detailed characteristics of opportunities being pursued e.g. how the redevelopment can enhance jobs in the region and what that means for economic and social activity within the city and region.

The important linkages are between maintaining the economic base through improved job creation, improved places to work, and increased tourism. A successful integration of these factors will impact on community wealth and wellbeing, regional income and have a positive impact on the social-economic environment.

The key demand signal is that renewal of the city centre is required. This means that over time Invercargill will become a less attractive place to remain in or to relocate to – it is a burning platform. Two issues are important:

- on the supply side, business and local government have come together to redevelop the city centre. The involvement of the private sector suggests

⁵ We have chosen this system of relationships which, although abstract, seeks to capture the salient elements of the real world. Any real world problem will have a large number of variables with a large set of, often complex, relationships between them. We wish to draw out the main points of interest without the complications of all the issues. In this way, we hope to gain insight into the problem at hand and advance the solutions for it. The potential cost of this approach is that the process of abstraction has eliminated characteristics that are vital to the full understanding of the questions under discussion.

The design of this analysis has deliberately been kept simple. To do this we have abstracted from the full detail of the sheep milk marketing chain. This analysis should contain just sufficient complexity and reality to allow us to capture and illustrate the advantages and disadvantages of the strategies adopted.

that transformation of the city centre has potential to be the catalyst for other investment

- on the demand side, the redevelopment generates interest over and above would have happened given the current building stock available.

This approach allows us to develop a richer view for Southland. This is a model of the redevelopment from the perspective of Southland society i.e. an aggregate perspective not an individual or entity perspective.

This has a number of immediate implications:

- building strong and durable connections matters for sustained wealth creation not one or two business decisions
- there are gains from trade between society and individual entities. Businesses benefit from the infrastructure created by public private partnership and society benefits from entrepreneurs providing new opportunities
- the development of sustained economic development is complex. That complexity can be an advantage over time because others are unable to replicate the conditions.

The key reason for using this type of approach is it shows that different activities can contribute to wealth creation in a region and each activity has a role in creating wealth.

4. Setting the baseline

To estimate the impact of the Invercargill City Centre redevelopment requires a description of what would occur “without” the development. This involves examining in detail the current status quo (or counterfactual). It includes a commentary on:

- What exists on the ground now (see Section 1.1)
- The private sector approaches that exist. Would some other investor without government funding put in the time and investment required?

The business as usual also includes examining the likely future policies that might influence the development. While this can be speculative, it is important to set out a credible understanding of expectations for future developments. The aim is to identify how the business situation is likely to change over the next 15 years, to establish a realistic base case.

4.1. Would the private sector step up?

In some sense the private sector has stepped up by forming a joint venture to drive the redevelopment. However, the real question is would the private sector do the redevelopment on its own? That is, does local/central government investment “crowd out” private sector funding?

The short answer is no. In the past there have been private initiatives to redevelop Invercargill CBD. These initiatives floundered because of the lack of community support. While we cannot say that we are 100% certain that the private sector would carry out a redevelopment, the demonstration effect of failed previous attempts to rejuvenate the city centre suggest it is most unlikely. Potentially the commercial returns will likely be lower than in major metropolitan centres (increasing the risk) therefore to encourage further business investment requires public intervention.

We would expect that the private sector would not consider attempting a redevelopment without local government support both vocal and financial.

4.2. Further understanding the baseline

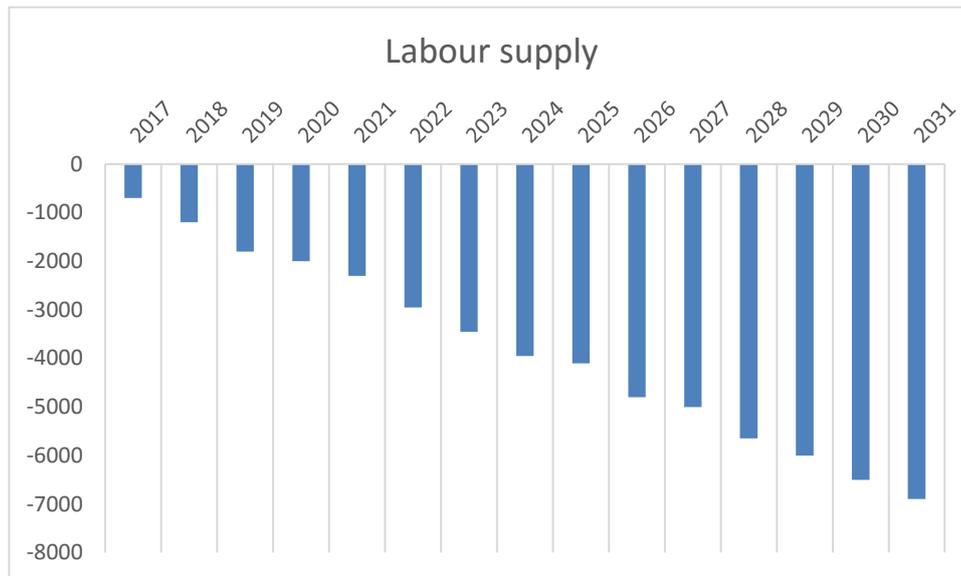
The baseline used here considers the previous two sections and section 1.1. It suggests that not only would there be not be a redevelopment, but the downward spiral would continue as more and more buildings become unliveable.

Instead of maintaining or growing the city we expect Southland to lose a further 5,000 people relative to what would have happened otherwise, with its consequent knock on effects to the local economy.

This is in line with the report by Roskrug and Pawar (2015). Their report suggest that Southland could potentially lose approximately 4,000 working age people by 2025 and 7,000 by 2031 (see Figure below). The main reason for this is an aging working population and not enough workers to replace them. This is backed up by a Venture

Southland Business confidence report which suggested that recruiting workers was the number one concern for business.⁶

Figure 5 Forecast labour supply



Source: Roskrug and Pawar (2015)

We have used this as a baseline to measure benefits associated with the redevelopment of the city centre.

Setting up the baseline is difficult because there is:

- Limited baseline data from which to measure any change
- Uncertainty about what initiatives could be trialled in the absence of the redevelopment although the chances of regeneration are slim
- The unusual nature of the Invercargill labour market, given its location, relative to the rest of the country.

Therefore, there are potentially several credible baselines. The one we assume here is open to question and should be treated as “work in progress”. We treat the baseline here as a tentative “peg in the ground”.

We assume that, Invercargill, without the redevelopment, would lose jobs. While we are unsure what industries will be most severely affected the main impact will be the inability to hold head offices and attract new workers. We also expect the increasing numbers of tourists to spend less than they otherwise would in Southland (with the redevelopment).

⁶ <http://venturesouthland.co.nz/sites/default/files/media/documents/Sothland%20Business%20Survey%20Report%202017.pdf>

5. Detailed approach and results

5.1. Methodology

5.1.1. We used our CGE model to assess the economic contributions of the redevelopment of the Invercargill city centre

We used NZIER's regional computable general equilibrium (CGE) model to assess the regional and national economic impacts of the redevelopment of Invercargill city centre.

CGE modelling is our recommended method for conducting policy analysis or sectoral impact studies, as it delivers more conservative, but more realistic, estimates of benefits and costs than commonly-used (and widely criticised) alternatives such as multiplier analysis.

Our CGE model contains information on 106 industries and 201 commodities within the economy, incorporates trade and financial linkages to world markets, and estimates price responses to demand or supply shocks.

As this CGE model is static, it can only look at 'before' (i.e. current situation) and 'after'. For our scenario design, we implement shocks to represent what the regional and national economies would look like with the increase in investment, employment and tourism spending following the redevelopment of Invercargill CBD.

A description of our CGE model and our modelling approach is outlined in Appendix A.

5.1.2. How we analysed the modelling results

We determine the flow-on effects of our shocks throughout the national and regional economies on GDP and industry output.

Macroeconomic effects

The national and regional results flow logically from the direct and indirect impacts. We focus on key macroeconomic variables such as Gross Domestic Product (GDP), exports, employment and household expenditure, which we use as a measure of economic welfare (how 'well off' we are).

Direct and indirect effects

In analysing the modelling results we track the impacts as they flow through the economy, beginning with the **direct** impacts on the construction and tourism sectors itself. We then analyse the flow-on or **indirect** impacts. It can aid understanding to split indirect impacts into the following categories:

- **supplying** industries – industries that supply the tourism and construction sectors with intermediate inputs are likely to benefit. Such industries include meal service providers, and business service industries.
- **household** expenditure industries – industries that households spend money on are likely to benefit from increased income that comes through employment and wages, and increased returns to capital from a growing tourism industry. Such industries include housing and real estate (which takes a large share of households’ budgets), and those for consumption goods like the retail trade.
- **competing export** industries – industries that suffer from the tourism industry’s growth as they compete for resources, which are now more expensive, and also face a stronger New Zealand dollar. Typically, these industries are the labour-intensive export industries such as horticulture and manufacturing.

5.2. Results from our CGE modelling

We have used two simulations:

- simulation 1 increases the population by 10,000 (by 2025) and reaches the \$1 billion tourism spend target by 2025.
- simulation 2 increases the population by 3,000 (by 2025) and reaches the \$1 billion tourism spend target by 2025.

Tourism spend is expected to be the same in both simulations. The model solves over medium/long term (2035). The SoRDS targets are factored into the long term growth assumptions.

Southland’s economy expands Table 3 presents the macroeconomic effects on Southland region. With increased investment, employment and tourism spending in the region, Southland’s real GDP is expected to rise by an annual \$48 million (0.84%) in simulation 1 and by an annual \$29 million (0.51%) in simulation 2 by 2035.

Annual real exports rise by \$14 million (0.40%) and \$13 million (0.36%) in simulation 1 and simulation 2, respectively.

Annual household spending increase by \$44 million (1.17%) in simulation 1 and by \$36 million (0.94%) in simulation 2.

The capital stock would rise by \$22 million (1.04%) and by \$12 million (0.57%) per annum in simulation 1 and simulation 2, respectively.

Table 4 Impacts on macroeconomic indicators at the regional level

Change from baseline (2018), in percent and in \$ million (real terms)

Redevelopment simulation		GDP	Household consumption	Wages	Employment	Exports	Capital stock
Sim 1	% change	0.84%	1.17%	0.59%	0.59%	0.40%	1.04%
	Level (\$m)	\$48	\$44	NA	\$14	\$14	\$22
Sim 2	% change	0.51%	0.95%	0.48%	0.48%	0.36%	0.57%
	Level (\$m)	\$29	\$36	NA	\$11	\$13	\$12

Source: NZIER

5.2.1. Supporting and downstream industries are positively affected

Table 4 below shows the flow-on effects of the redevelopment project in Southland, other regions and New Zealand. Supporting (downstream and supplying) industries of tourism are positively affected from the redevelopment of Invercargill's city centre.

Table 4 shows how the economy will change over the forecast period relative to the baseline. In the changing economy there will be more emphasis on construction (in the short run) and retail and tourism in the long run. Some industries grow faster (those that are supporting industries) and some grow slower (mainly agricultural industries) as labour moves from agriculture into tourism. Note these industries are not declining – their contribution is still significant, they are just not growing as fast relative to a baseline projection (a slight change in the emphasis associated with economic activity). Relative to those industries which are growing faster the negative impact is relatively minor in Southland.

Further industries such as transport and storage do grow outside Southland as a result of the rebuild in the rest of New Zealand. However, in Southland other industries do marginally better. Having said that, transport equipment and air and other transport sectors are significant contributors to the Southland economy as a result of the rebuild and tourist influx.

By 2035, output of Southland industries is expected to increase by \$75.2 million (annually) and \$32.9 million (annually) under simulation 1 and simulation 2, respectively. Industries such as food and beverages, retail, sports and recreation expand because of the increase in tourism spending stemming from the redevelopment of Invercargill.⁷

Also, higher incomes for households lead to increased spending in industries such as other personal services, retail and real estate services.

⁷ Output from industries more labour-intensive increases more in simulation 2 than simulation 1, as it supposes a lower increase in employment following Invercargill's city centre redevelopment. This is the case for food and beverage services or accommodation for example.

Table 5 Flow-on effects of the redevelopment, selected industries

Change from baseline (2018), in \$ million (real terms)

Industry	Type	Simulation 1			Simulation 2		
		Southland	Rest of NZ	New Zealand	Southland	Rest of NZ	New Zealand
Food and beverage services	Supporting industries	\$15.0	\$11.6	\$26.6	\$15.9	\$11.3	\$27.2
Accommodation		\$12.5	\$4.6	\$17.1	\$13.4	\$4.3	\$17.6
Beverages & tobacco		\$10.7	-\$2.9	\$7.8	\$10.7	-\$3.1	\$7.6
Finance & insurance		\$10.0	-\$5.4	\$4.6	\$9.9	-\$6.8	\$3.1
Education and health services		\$8.8	-\$1.2	\$7.6	\$9.0	-\$1.8	\$7.1
Transport equipment		\$8.5	-\$3.2	\$5.3	\$8.7	-\$3.0	\$5.7
Air and other transport		\$7.4	\$10.8	\$18.2	\$7.4	\$10.3	\$17.7
Sewerage/waste		\$6.8	\$2.7	\$9.5	\$7.7	\$2.3	\$10.0
Textiles		\$6.7	\$0.7	\$7.4	\$6.8	\$0.5	\$7.3
Property services		\$6.7	\$14.1	\$20.7	-\$2.5	\$18.6	\$16.0
Communication services		\$6.3	-\$4.7	\$1.6	\$6.3	-\$5.1	\$1.2
Retail		\$5.6	-\$1.3	\$4.4	\$3.4	-\$1.5	\$1.9
Vehicle wholesaling		\$4.9	\$1.0	\$5.9	\$5.1	\$0.9	\$6.0
Transport & storage		Competing industries	-\$0.8	\$6.4	\$5.6	-\$0.9	\$5.8
Seafood processing	-\$1.1		-\$5.2	-\$6.3	-\$1.3	-\$5.4	-\$6.7
Wood processing	-\$1.6		-\$4.3	-\$5.9	-\$2.2	-\$4.0	-\$6.2
Agriculture services	-\$1.9		-\$1.6	-\$3.5	-\$2.2	-\$1.6	-\$3.8
Sheep & beef	-\$1.9		-\$3.7	-\$5.7	-\$2.4	-\$3.9	-\$6.2
Central government	-\$2.8		\$2.2	-\$0.6	-\$2.5	\$2.0	-\$0.5
Dairy cattle	-\$3.4		-\$6.6	-\$10.0	-\$4.1	-\$6.9	-\$10.9
Metals manufacturing	-\$3.4		-\$6.5	-\$9.9	-\$5.4	-\$6.0	-\$11.5
Dairy processing	-\$4.5		-\$11.5	-\$15.9	-\$5.0	-\$12.4	-\$17.4
Meat processing	-\$5.6		-\$4.6	-\$10.2	-\$6.0	-\$4.9	-\$10.9
Total industry outputs		\$75.2	-\$22.9	\$52.3	\$32.9	-\$7.9	\$25.0

Source: NZIER

5.2.2. Household consumption effects

Table 6 presents the impacts of Invercargill’s city centre redevelopment on regional wages and household consumption – our proxy for ‘welfare’ or living standards.

We estimate the increase in real household consumption to be \$44 million (1.2%) in the case of simulation 1 and \$36 million (0.95%) for simulation 2. The increase in real household consumption is driven by the rise in employment and real wages.

Table 6 Changes in household consumption and wages

Change from baseline (2018), in percent and in \$ million (real terms)

Indicator	Simulation 1		Simulation 2	
	\$ million	%	\$ million	%
Household consumption	\$44	1.2%	\$36	0.95%
Wages	NA	0.59%	NA	0.48%

Source: NZIER

5.3. Headline economic impacts

Most of the national results are driven by the growth in Southland’s economy. National real GDP will rise by \$63 million (0.02%) and \$49 million (0.02%) for simulation 1 and simulation 2, respectively. Household consumption – our proxy for welfare – increases by \$61 million (0.04%) in simulation 1, and by \$56 million (0.03%).

In addition, investment increases to take advantage of the attractive rates of return offered by the construction and tourism sectors. That generates increases in the nation’s capital stock of \$27 million (0.02%) and \$19 million (0.02%) in total, for simulation 1 and simulation 2, respectively. Table 7 summarises these effects.

Table 7 Impacts on macroeconomic indicators at the national level

Changes from baseline (2018), in real terms

Redevelopment simulation		GDP	Household consumption	Wages	Capital stock
Sim 1	% change	0.02%	0.04%	0.05%	0.02%
	Level (\$m)	\$63	\$61	NA	\$27
Sim 2	% change	0.02%	0.03%	0.05%	0.02%
	Level (\$m)	\$49	\$56	NA	\$19

Source: NZIER

6. Other significant outcomes

6.1. Spending power of Southlanders is higher than other regions

The lower cost of housing (relative to other cities) coupled with higher household income means that any developments that stimulate economic growth within the region are likely to ensure strong spending from locals.

From Table 8 below, it is clear that housing costs as a percentage of household income is most favourable in Southland relative to other major centres. Therefore, the spending power of Southlanders is much higher than other parts of New Zealand – almost double that of Aucklanders.

By encouraging more people to live in Southland it is likely to increase spending in the community over and above what they are likely to spend elsewhere in New Zealand. This is not only a gain to Southland but to New Zealand.

Table 8 Comparisons between housing costs and average household income

June year 2018

Regions	Average household income	Housing costs	Housing costs as a percent of household income	Discretionary income
Auckland	\$82,736	\$13,883	17%	\$68,853
Wellington	\$81,740	\$11,749	14%	\$69,991
Canterbury	\$65,594	\$9,871	15%	\$55,723
Southland	\$78,100 ¹	\$7,871 ²	10%	\$70,260

Notes (1) Venture Southland estimate (2) Estimate of the South Island other than Canterbury.

Source: <https://www.stats.govt.nz/information-releases/household-income-and-housing-cost-statistics-year-ended-june-2018> and <http://venturesouthland.co.nz/resources/southland-economy-statistics>

6.2. Potential for Invercargill to be a tourist gateway

The region has a goal of reaching \$1 billion of tourist spending by 2025. To meet this objective requires further tourism infrastructure investment. The redevelopment of Invercargill's city centre is an integral part of the infrastructure required and could act as a catalyst for further development of the region's tourist offerings.

In particular, it can act as a gateway to the region. In this way tourists can be 'dispersed' to different parts of the region and potentially away from the main visitor

concentration centres or arrival gateways where infrastructure is already being stretched. From a central government perspective, the aims are to:

- reduce pressure on the core areas where key attractions are located by enticing visitors elsewhere (such as Queenstown)
- disperse tourists to a variety of destinations. If they are drawn to areas such as Southland, their presence can provide new opportunities for entrepreneurs and create additional employment. Thus, encouraging tourists to venture into areas where economic stimulation (through employment and income) can occur
- increase the overall attractiveness of a destination by presenting 'new' experiences/features for visitors, thus providing a platform for revised marketing programmes, with the aim to increase length of stay and total spending.

Dispersal strategies are aimed at increasing visitors' satisfaction with the product and thus entice them to stay longer in the destination(s) and ultimately to spend more. It is hoped that by creating linkages to non-traditional tourist areas, the product appeal is enhanced, and these areas can tap into an already captive audience in the region.

An important part in developing dispersal strategies is to establish tourist gateways, staging areas, and the clustering of attractions. Southland offers a cluster of outdoor attractions (great walks, jumping-off point to Stewart Island, The Catlins, excursions to Fiordland, southern scenic route etc.). Invercargill can be important because it offers facilities that tourists require when first entering or when leaving a region.

In this way it can combine the gateway concept with a regional dispersal strategy. This not only satisfies regional objectives for Invercargill but also national objectives because it offers alternatives to established routes.

To underpin the potential for Invercargill to become a gateway to the region, Air New Zealand have announced a trial jet service between Auckland and Invercargill 5 times a week from August this year.⁸ Both tourism and business could benefit from the increased connections.

Further, the gateway concept is further enhanced by a cluster of new attractions and infrastructure such as: new ILT hotel, SIT creative centre, arts centre proposed by the ICC, and the new tourism attraction Motorcycle Mecca.

6.3. Quality jobs supported by quality educational providers

Southland has currently a tight labour market. To entice further workers to the city will require a concerted effort by educational facilities such as Southern Institute of Technology (SIT) to taking advantage of the opportunities generated by the CBD rebuild - both during the rebuild and after the rebuild.

⁸ <https://www.stuff.co.nz/travel/news/109361329/air-new-zealand-launches-first-ever-direct-service-between-auckland-and-invercargill>

By enhancing the attractiveness of the city through the rebuild the aim is to retain those already in Southland and entice others to stay who have come to the city to study. This will allow for the potential to further:

- build a stable and vibrant workforce that can foster careers around a variety of occupations (a benefit to staff and their dependents)
- train on the job, improve the skills using top quality and close by educational facilities such as the Southland Institute of Technology (a benefit to workers attracted to Southland)
- improve resilience so that Southland can weather the economic shocks that will inevitable come as sectors grow and decline (a benefit nationally, to the region, and workers).

In the short term, this approach dovetails with existing programmes designed to improve trade skills of students at SIT. SIT offers courses that combine practical employer-based work experience as well as classroom activities. The Construction workshop is part of a state-of-the-art SIT Invercargill campus, close to the proposed Invercargill city centre redevelopment.

Longer term, it also maximises the chances of attracting and providing quality jobs in areas other than construction to sustain the Southland economy. This will be mutually reinforcing since SIT is likely to enhance its reputation further as a reliable supplier of high quality recruits.

A pointer to SIT's current reputation is the low level of unemployment among young adults in Southland.

6.4. Summary

Successful regional development interventions are a long-term process that can deal with the impacts of rapid change by equipping its citizens and associated institutions with the ability to cope and flourish (more like a gentle breeze).

It follows that the qualitative outcomes (set out Table 9) are the products of long-term incremental advancements rather than one-off gains. This is significant since it is the year-on-year incremental gains that will drive the Southland economy.

By developing this type of approach, we can trace through the impacts of regional development on business activity which in turn has social and wellbeing impacts.

By setting out the framework in a matrix form you can spotlight the various linkages in a systematic way on a regional basis.

Table 9 Understanding the linkages between sectors

		Effect of					
		Quality jobs and education	Tourism	Business	Marketplace	Socio-economic	Consumption/spending power
Effect on:	Education		Increased tourist demand generates demand for goods and services underpinned by education	Business will require quality jobs. This is in line with SoRDS objectives	The market is likely to demand more jobs	Improvements in socio-economic conditions are likely to increase demand for education	As spending power increases the demand for education is likely to increase indirectly
	Tourism	Improved visitor experience with better quality service		Will encourage better tourism offerings	More diverse offerings as demand increases	Improved socio-economic outcomes will improve individual tourist outcomes	Increased consumption will generate a wider range of goods and services for tourists
	Business	Increased business opportunities	Increases the business opportunities		Likely to encourage a demand response from business	Improve socio-economic outcomes will improve business quality	Increases business opportunities
	Marketplace	More vibrant and diverse offerings	More tourists allow for more opportunities	Assists in developing a more vibrant marketplace		Likely to improve marketplace outcomes	More vibrant marketplace
	Socio-economic	Improved quality of life	Offers the chance to improve Southlanders quality of life	More year-round jobs will impact positively on social outcomes	A more vibrant marketplace will have an indirect impact on socio-economic outcomes		May indirectly improve socio-economic outcomes
	Consumption	More opportunities for Southlanders	More tourists increases total spending and spending per tourist	Business is likely to increase its offerings as demand increases	An increase in market size and diversity will increase consumption	Improve socio-economic effects are likely to have indirect impacts	
	Overall wellbeing	Improved workforce quality impacts positively on wellbeing	Has the opportunity to improve wellbeing	Likely to have a positive impact on wellbeing	A larger marketplace is likely to have a positive impact on wellbeing	Strong positive connection	Indirect positive link

Source: Adapted from Swann (2016)

7. Conclusion

The redevelopment of Invercargill's city centre offers the potential to act as a catalyst for further growth in Southland. Not only will it generate substantial jobs in the short-run but it will also set up Invercargill as a potential gateway for tourists coming to the region providing on-going work for other businesses.

The expected boost to GDP is between \$29m and \$48m per year or \$286m and \$475m until 2035. The job impact is also likely to be large with between 500 and 600 required for the rebuild. We also expect the Southland population to increase by between 3,000 and 10,000 permanently.

Our approach shows that the planned expenditure will provide potential quantitative and qualitative benefits for the region:

- those aspects of the strategic vision that can be quantified:
 - the temporary GDP boost with the construction and redevelopment of the central city block
 - increasing the number of tourists to Southland over and above the expected forecasts. The aim is to increase the tourist spend to \$1 billion per annum by 2025 in line with SoRDS targets
 - making Southland an attractive place to live. The SoRDS 2025 target for the region is to increase the population by 10,000 (this target was motivated by the Roskrige and Pawar (2015) study)
- those benefits that cannot be quantified but underpin the strategic vision:
 - Southlanders have more spending power than other regions since their average household incomes are higher and housing costs are lower. More people attracted to the region will increase spending over and above other regions
 - Invercargill has the potential to become a gateway to the region increasing the chances of more tourists coming to Southland
 - An increase in full-time jobs is likely to support further education within region.

Without the renewal associated with the redevelopment the chances of increasing the region's population permanently would be significantly reduced. The main risk is that the region may lose people as suggested by Roskrige and Pawar (2015). The importance of this result is highlighted by the Venture Southland's Business Confidence survey of 2017 which identified the main challenge for Southland business is being the ability to recruit staff.

Appendix A CGE Modelling

We used NZIER's static CGE model to analyse the regional and national economic impacts of public and private developments and increased tourism spending from the redevelopment of Invercargill's city centre.

Invercargill's city centre redevelopment and increased tourism spending will have positive flow-on economic impacts...

Invercargill's city centre redevelopment and increased tourism spending create economic opportunities for the regional and national economies. The construction of the public and private developments will support the Southland construction sector and draw in materials from other sectors of the regional economy.

When private developments become operational, they will attract new visitors to Southland from the rest of New Zealand and overseas who will contribute to tourism spending.

The initial or 'direct' injections of construction, infrastructure and tourism expenditures have flow-on effects that filter through the national and regional economies. For example, as international visitors demand more accommodation, this also pushes up the demand for other services required to sustain them, e.g. laundry services, transport, etc. The additional demand for workers in these downstream industries pushes up their wages, which allows them to spend more on goods and services. This has further flow-on effects.⁹

...with some offsetting impacts

Any economy-wide modelling also needs to consider the potential offsetting effects associated with the increased construction, infrastructure or tourism spending. One example of such an effect is 'Dutch disease', whereby increased exports of tourism services push up the New Zealand dollar exchange rate, making all other exporters less competitive. Even if this appreciation is small, it will still be felt across all exporting industries.

Similarly, if wages increase in the building sector during the construction phase, this will also increase the input costs for all other sectors in the economy that use builders, which would reduce their competitiveness.

Our CGE model captures these effects

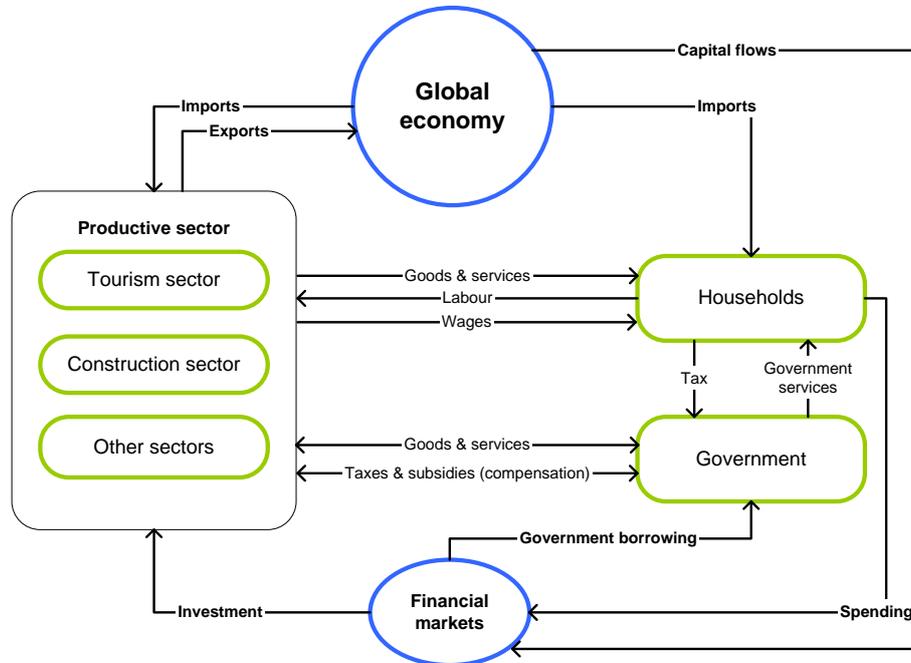
The CGE model is a representation of the New Zealand economy and its regional components that contains information on 106 industries and 205 commodities in its basic form.

The model captures the various inter-linkages between these sectors, as well as their links to households (via the labour market), the government sector, capital markets and the global economy (via imports and exports). A visual representation is shown in

⁹ Other methodologies, such as multiplier analysis or Economic Impact Analysis based on input-output data, tend to overstate economic benefits, without taking into account offsetting factors such as resource costs and availability. CGE analysis addresses these shortcomings and provides a more robust, credible set of results. See Gretton, P. (2013). 'On input-output tables: uses and abuses'. Staff Research Note, Australian Productivity Commission, Canberra, for a discussion.

Figure 6, highlighting the complex and multidirectional relationships between the various parts of an economy.

Figure 6 Components of a CGE model



Source: NZIER

Key features of the model are:

- each industry can produce a number of different commodities.
- production inputs are intermediate commodities (domestic and imported) and primary factors (labour, land and capital).
- the demand for primary factors and the choice between imported and domestic commodities are determined by Constant Elasticity of Substitution (CES) production nests. This means an increase in price of one input shifts sourcing towards another input.
- intermediate goods, primary factors and other costs are combined using a Leontief production function. This means the proportion of production inputs is held constant for all levels of output.
- the production mix of each industry is dependent on the relative prices of each commodity. The proportion of output exported or consumed domestically is also dependent on relative prices.
- policy impacts are often unevenly spread across industries and regions. To capture these heterogeneous effects, the model is extended to include a

regional component. A ‘top-down’ approach is used to decompose national impacts to the regional level, using regional data as weighting.¹⁰

Core data is based on Stats NZ’s input-output tables

The model is based on a large database containing the value flows of the economy. The database defines the initial structure of the economy, which is assumed to be in equilibrium in all markets. In other words, the sectors in the economy start off in a stable relationship with each other and are then ‘shocked’ by new spending on construction or new tourism, before settling back into slightly new relationships caused by the additional activity in the economy.

The structure of the database is broadly similar to traditional input-output tables. For example, commodities may be used as intermediate inputs for further production, used in investment, exported or consumed by households and the government. Industry costs include the cost of intermediates, margins, taxes and primary factor costs for labour, land and capital.

The database has been sourced initially from Stats NZ’s 2013 input-output tables. We calibrate the database to 2018 levels using Stats NZ’s latest National Accounts.

Once we have calibrated the model and developed a baseline in which all markets are in equilibrium and all resources employed,¹¹ we then ‘shock’ key parameters to simulate the effects of the public, private developments and increased tourism spending.

Three impacts: increase in employment, investment and tourism spending

We have modelled two redevelopment scenarios: **Simulation 1** and **Simulation 2**. In **both simulations**, we model the following:

- a \$40 million annual increase in public and private infrastructure investments in accommodation (hotels), retails, food and beverage (restaurants) industries between 2019 and 2030
- a 5% annual increase in domestic tourism spending and a 11% annual increase in international domestic tourism.¹² The combined public and private investment in tourism facilities would lift domestic and international tourism spending in Southland.

The only difference between the two scenarios is related to the employment increase in Southland by 2030.

¹⁰ The regions in the model are: Northland, Auckland, Waikato, Bay of Plenty, Gisborne, Hawkes Bay, Taranaki, Manawatu-Wanganui, Tasman-Nelson, Marlborough, West Coast, Canterbury, Otago, Southland.

For the purposes of this analysis and to speed-up the computational process, we have applied our shocks directly to the Southland region and aggregated all the other regions into Rest of New Zealand

¹¹ As a result of this assumption, we cannot easily take into account seasonality or spare capacity in the tourism and construction sectors.

¹² Our estimates are based on Southland Tourism Key Indicator (2018): <http://venturesouthland.co.nz/sites/default/files/media/documents/20%20June%202018%20Southland%20Tourism%20Key%20Indicators.pdf>

- in **Simulation 1**, we assume that the Southland population increases by 10,000 people by 2030, which represents 7,943 additional workers or 0.80% of additional workers per annum.
- in **Simulation 2**, we assume an increase in Southland population of 3,000 people, which represents 2,383 additional workers or 0.25% of additional workers per annum.

As our CGE model is static, it can only look at ‘before’ (i.e. current situation) and ‘after’. We therefore do not explicitly model the *timing* of the changes in investment, tourism spending and employment. Instead, we analyse a static, long-term scenario that estimates the overall economic effects of a *Status Quo* or *Stretch approach* scenarios.

Results of the simulations give us an overview of what the regional and national economies will look like following the redevelopment of Invercargill’s city centre, or conversely if the redevelopment did not happen.

We then determine the flow-on effects of our shocks throughout the national and regional economies on GDP, household consumption and industry output.

A.1 Closure

In any CGE model, it is important to understand which factors have been allowed to vary and which remain fixed by assumption (also known as exogenous variables). The particular combination of fixed factors is known as the closure.

Since our CGE model is static, we don’t know the solution path over time. Instead, we assume that the New Zealand economy operates within a certain timeframe either along-run or a short-run depending on the purpose of our simulations.

For this project, we choose a long-run closure. The main assumptions which characterise a long-run closure are the following (see Table 10):

- national employment is fixed but labour is completely mobile between industries and regions, and real wages adjusts. This is consistent with the idea that, both the labour force and the rate of employment are, in the long run, determined by mechanisms outside the model
- household and government expenditures move together to accommodate a fixed balance of trade as a share of GDP
- rates of return are exogenous, and capital is mobile between industries and regions. This mobility can occur either in the form of machinery etc. being physically moved, or capital in one industry/region being allowed to depreciate without replacement while investment builds up the stock of another industry/region
- foreign currency prices of imports are naturally exogenous
- real government consumption is also exogenous
- other exogenous variables include rates of production tax, technological coefficients, national population, and national labour supply.

Table 10 Fixed elements of the CGE model with a long-run closure

Variables
Taxes on production
Technological change
Government demand
Gross growth rate of capital
Gross rate of return on capital
Number of households
National population
National labour supply
Import prices, foreign currency
Foreign demand for New Zealand exports
Land use

Source: NZIER

Appendix B Additional results from our CGE modelling

Table 11 Macroeconomic effects

Changes from baseline (2018), in real terms

Simulations	Indicator		GDP	Household consumption	Wages	Exports	Capital stock
Simulation 1	Southland	% change	0.84%	1.17%	0.59%	0.40%	1.04%
		Level (\$m)	\$48	\$44	NA	\$14	\$22
	Other regions	% change	0.01%	0.01%	0.04%	-0.02%	0.00%
		Level (\$m)	\$15	\$17	NA	-\$13	\$5
	New Zealand	% change	0.022%	0.04%	0.05%	0.00%	0.023%
		Level (\$m)	\$63	\$61	NA	\$2	\$27
Simulation 2	Southland	% change	0.51%	0.95%	0.48%	0.36%	0.57%
		Level (\$m)	\$29	\$36	NA	\$13	\$12
	Other regions	% change	0.01%	0.01%	0.04%	-0.02%	0.61%
		Level (\$m)	\$21	\$20	NA	-\$18	\$7
	New Zealand	% change	0.02%	0.03%	0.05%	-0.01%	0.02%
		Level (\$m)	\$49	\$56	NA	-\$5	\$19

Source: NZIER

