

STAGE 3 - SECTION 32

CHAPTER 17

RURAL - CRANFORD BASIN

APPENDIX 6 - CRANFORD BASIN ECONOMICS REPORT



Christchurch City Council

Cranford Basin Rezoning – Initial review of Economic Effects

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06/04/2015	First draft	
05/06/2015	2 nd Draft	Including information on the value of the potential activity that could be undertaken in the study area

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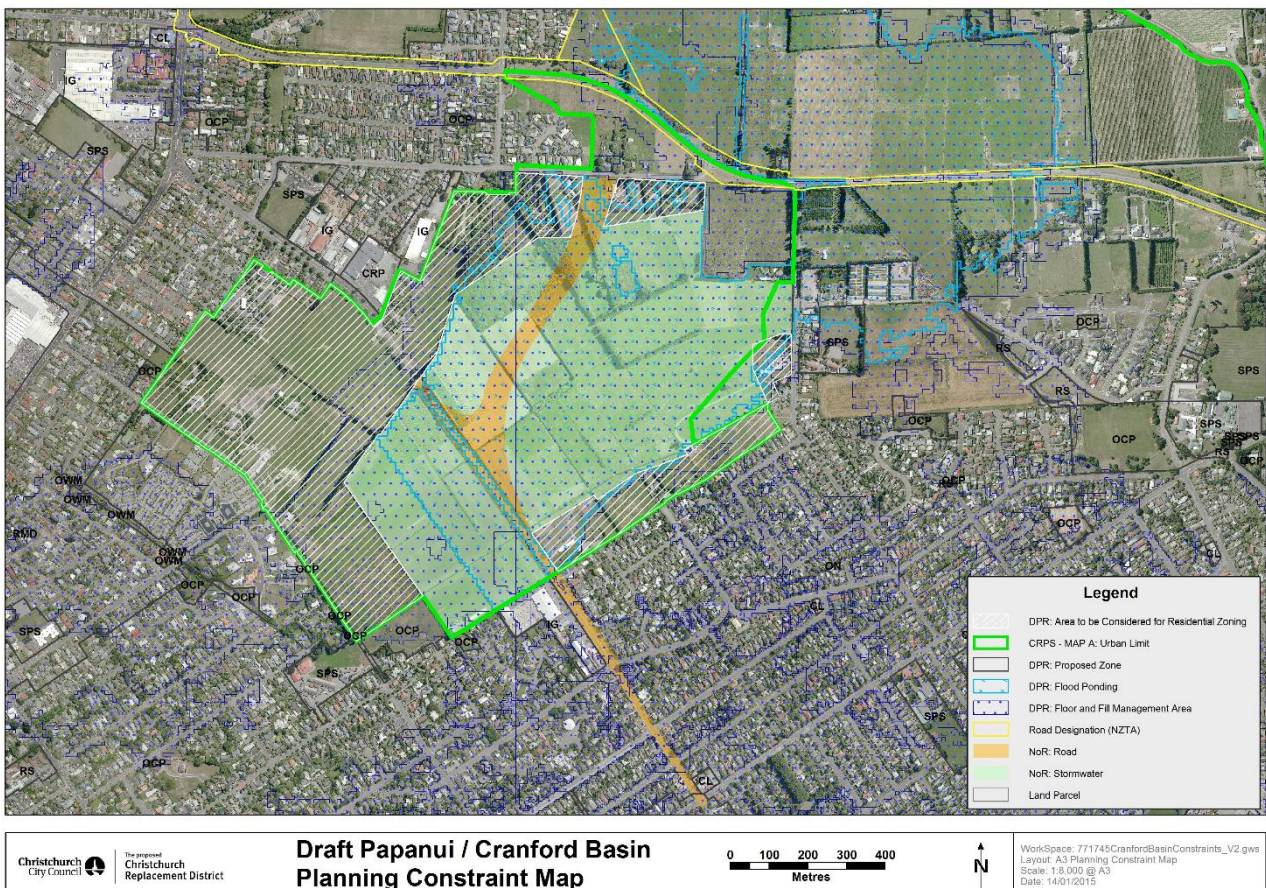
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1 Introduction

Christchurch City Council (CCC) is considering a proposal to alter the zoning of part of the Cranford Basin from rural to urban. The area to be rezoned is around 55 ha and is the remnant land not required for storm water and transport works (see Figure 1-1). In this paper we provide high level commentary about the potential economic effects, their likely scale and direction. This is a high level assessment and is based on preliminary data analysis. We have used existing information and data to inform our assessment. This assessment focuses on the Cranford Basin area and compares the area's productive potential with the potential economic effect associated with a residential development. This assessment does not compare Cranford Basin and the potential economic effects of developing this area against alternative areas. In other words, this assessment has a 'within Cranford Basin' perspective. This assessment will need to be viewed in the context of Christchurch's over growth needs, how the Cranford Basin opportunity compares to alternative locations around the city as well as other disciplines (such as transport and planning).

It is our understanding that the Christchurch City Council wishes to understand the potential economic effects associated with changing the zoning from rural to urban (residential).

Figure 1-1: Cranford Basin – Area



2 Potential Values

The site is located in Cranford Basin, an area that is prone to flooding. We understand that the areas considered to have a high risk of flooding are excluded. Currently, the area is being used for land intensive rural industries with limited capital intensive activities.

Land is a valuable resource. Areas on the urban fringe can fulfil a number of important functions in the urban-economic environment and it tends to accommodate activities that use land resource and key business input. In some cases these fringe areas also contain land resource that is inactive (i.e. not using in active production processes). As the urban and built environment expands, a need arises to transition the land resource towards other more capital intensive uses. The general sequencing of this transition is well documented and the need to pro-actively manage this process is a key planning issue. The area where this transition takes place is also one where urban and rural uses mix and often clash. The Cranford Basin study area is an example of an area where these tensions have to be managed. The CCC is currently engaged in this management process through which it is seeking to protect valuable resources while enabling high quality development outcomes.

In this section we summarise the potential economic value of the area and compare it to a residential development. The direct economic transactions are assessed and the flow on (direct, indirect and induced) effects are also summarised. The section concludes with general comments on the potential effect on urban form.

2.1 Potential Contribution

Rural areas provide various external benefits. Even seemingly unproductive land often provides unique such as aesthetic value. The preservation of open space preservation is often the antithesis of urban expansion, particularly into productive rural land, and ecologically or culturally valuable lands.

Allowing development to take place on rural land will result in a loss of productive *potential*. Such a loss would mean that the economic value of the activity taking place on the land would be replaced by another activity. Clearly this should only progress if the 'new' activity has a higher value. However, it is also important to consider the option value. That is the value associated with the *potential* activity that could be undertaken on the site given its current natural attributed. If the land is converted from primary production to another urban use such a residential activity, then the economic return from the rural activity would be lost. This includes both current production and potential production and can be seen as the baseline value.

Therefore, the current economic contribution of the study area is a function of the activity that is currently being undertaken on the land as well as the activity that could be undertaken. That is the production *potential* of the area.

The net additional economic effect of rezoning is the difference¹ between the economic contribution of current (potential) activities, and the enabled use(s). In many cases, the current and potential contributions are estimated based on the relationship between the area, the type of economic activity and

¹ The difference should be adjusted to reflect any lost option values. Option values include the value placed on maintaining or preserving an asset or amenity even if there is little or no likelihood of the individual actually ever using it. Further, the option value is recognised as an element of the total economic value of environmental resources. It is however, not always possible or practical to estimate and quantify these values.

business/economic performance ratios (e.g. Revenue or Sales per hectare, employment per hectare). These values are then used as part of Discounted Cash Flow Analysis, to translate current and future activity (and value) into a single figure, a Net Present Value (NPV) number. This approach assumes that the current business/economic parameters capture relevant characteristics such as: productivity, production economies (spatial scale and intensity requirements), consumer preferences, consumer incomes, and developer/development costs.

In general, investors (or households) will utilise a piece of land (real estate) to generate the maximum economic value based on the underlying land use permissions. The maximum value is of course subject to a range of limitations and constraints guiding the type of activity that can be (legally) undertaken on the land (including land use and building controls).

2.1.1 Current activity

A desktop review of the area suggests that the current scale of economic activity in the study area is fairly limited. This implies that the land resource is not currently used for high value economic activity. Reasons for this could include:

- High capital and investment requirements,
- Economic production size constraints (diseconomies of scale issues),
- Site specific issues such as drainage and topography considerations,
- Market factors such as uneconomic returns on the goods/produce that can be cultivated on the site, and
- Seasonality affects.

A high level review of the latest business demography statistics for the Cranford Basin area shows that the overall scale of agriculture activity in the study area is small. Combining available business statistics with sectoral performance estimates (Output and Value Add per sector) suggests that the annual value of the (rural industry) production in the study area is around \$115,000 (output) with annual Value Add of some \$40,000. This suggests that the area is not an intensive production area. Assuming that the production intensity remains stable over the next 30 years then the value of the activity is estimated at \$880,000 (Value Added; ranging between \$680,000 and \$1.2m²). However, if the land is rezoned then some potential land use(s) (and economic activity) is foregone. This foregone activity can be viewed as the opportunity cost of shifting to another land use(s).

2.1.2 Current Potential Production Value

The size of the potential production value is a function of the type of activity that could be undertaken on the land under current zoning. In turn this is a function of the business economics associated with the activity. Business economics include aspects such as:

- The yield per area e.g. income generating potential per unit of land (\$/ha),
- The price per unit e.g. \$/t that can be realised for products, and
- The cost structures and relationships of the business including gross profit margin, capital structure (debt/equity ratios), ability to generate a (required) rate of return and sectoral risks.

² Using discount rates of 4%, 6% and 8%.

Horticulture and agriculture generally have relatively low margins. For example, between 2011 and 2013 'Surplus per Employee' for horticulture has ranged between \$2,200 and \$13,800. Small margins mean that it will be difficult for an investor to generate a sufficiently large investment on his/her investment. An investor would not invest in an underperforming opportunity but instead seek out other opportunities. In other words, the cost structure of horticulture means that an investor is unlikely to invest in an extensive (average value product) operation because of low yields and an unfavourable risk profile. However, farming a higher value product will improve financial returns and the associated risk profile.

We used a financial model and existing research³ to estimate the potential production value of the land. We use two hypothetical examples⁴:

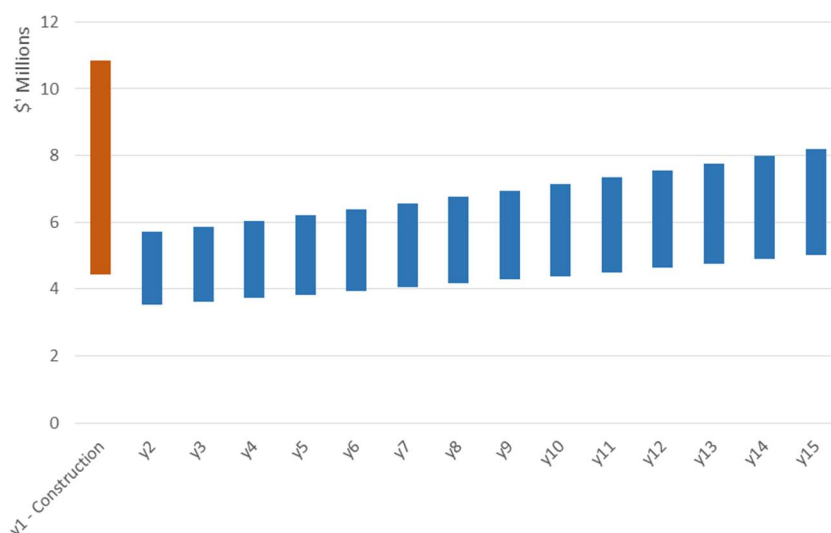
- a) A high value product but farmed extensive, and
- b) A high value product that is farmed intensively.

Using these two examples provides an ability to estimate the *potential* economic value of the site. Based on these examples, the study area has the *potential* to generate sales of between \$3.4m and \$5.6m annually, growing⁵ to \$5.0m and \$8.2m in year 15. This excludes construction associated with establishing the necessary infrastructure. The development cost is estimated at between \$4.6m and \$10.8m. In Net Present Value (NPV) terms, over 15 years, the potential sales is estimated⁶ at between \$38.4m and \$62.5m.

These figures reflect the potential of the land. This can be viewed as the baseline value. Figure 2-1 shows the baseline values over time.

The (hypothetical) business activity will also have supply chain effects, generating flow on economic impacts in the wider economy. These economic impacts are measured in Value Added terms (which is similar to GDP). The analysis suggests that the total economic impact is between \$39.2m and \$65.7m. This is the total impact and includes the direct, indirect and induced effects throughout the entire Christchurch economy.

Figure 2-1: Potential Production Cost (Range; \$'m)



These values represent the potential value of the area if it was used for horticultural activities and reflects the baseline potential as well as the economic flow on effects. If the area is developed and the horticulture potential is lost, then these 'lost economic values' are the immediate effect (the loss of potential sales) as well as the flow on effects. This assumes that it would not be possible to restore the land to a state that would sustain horticulture.

³ CCC Report: Rural Land Economic Assessment. Prepared by M.E in Nov 2008.

⁴ We did not consider dairy farming because of the recent contraction in milk commodity prices.

⁵ This growth is driven by inflation and price changes and not a lift in actual output volumes.

⁶ Using a 6% discount rate. If a 4% discount rate is applied, the figures change to \$44m and \$72m. A 8% discount rate returns \$33.8m and \$55.0m.

2.1.3 Potential Value of Residential Use

Understanding the economic effect of moving from one land use to another requires the baseline values (outlined above) and the values associated with the alternative use. In this case, the alternative use is residential. Depending on the average densities used when developing the site, there is potential to deliver 235 to 275 new residential sites⁷ that are then developed. This suggests that the total construction cost (to build the residences) could be in the order of \$57m-\$67m. The construction⁸ impacts are one-offs that occur over the development period. Once occupied the dwellings have a different set of economic impacts, which are mostly related to how households spend their income⁹. This includes aspects such as retail spending, investment and savings, mortgage payments, energy and transportation spending. Retail spending is one of the largest spending streams. The assessment puts the expected retail demand coming from the area, once fully developed, at between \$9.1m and \$10.7m per year. In NPV terms¹⁰, this retail demand is estimated at between \$86.1m and \$100.8m. The final scale of this retail demand depends on a range of factors, such as the development's configuration (number of lots), socio-demographic features of the residents, general economic conditions and the interest rate environment.

The construction and retail spending will generate wider economic impact (as the spending flows through the economy). The total¹¹ Value Added effects of the residential component (construction and spending) is estimated at between \$8.6m and \$10.1m for the retail spending and \$30.2m and \$35.5m for the construction spending. In NPV terms (@6% and over 15 years) the total VA effect is estimated at between \$105.5m and \$123.6m, of which the construction effect accounts for 28%.

2.1.4 Net Effect

From the above, enabling residential in the Cranford Basin will have a net positive effect after adjusting for the loss of potential activities associated with the land resource. Table 2-1 summarises the net difference between the baseline potential and the residential development.

Table 2-1: Summary of the Net Effects

		Range	
Spending	Average annual effect	\$3.9m	\$5.0m
	NPV of Effects (Excl construction)	\$38.3m	\$47.7m
Value Added	Average annual effect	\$3.2m	\$4.4m
	NPV of Effects (Excl construction)	\$31.7m	\$42.4m

NPV are at 6% and over a 15 year period

The average annual effect of enabling the residential development is estimated at between \$3.9m and \$5.0m (per year). The construction spending will add between \$52.4m and \$56.1m to this but is only felt in one year (or the period over which construction takes place). This implies that a substantial portion of the spending effect is related to construction.

⁷ This is based on a total area of 55ha, 70% of the area used for lots and lot sizes ranging between 600m² and 700m².

⁸ This excludes any civil and site preparation work.

⁹ The funds spent are normally sourced from salaries and wages but can also include the spending of saved funds.

¹⁰ 6% and over 15 years. Using a 4% rate returns and NPV of \$97.9m and \$114.6m while an 8% rate yields \$76.3m and \$89.3m respectively.

¹¹ Direct, Indirect and Induced flow on effects.

These effects are ongoing and felt over multiple years. Over a 15 year period the difference net position in terms of spending that is felt in the local economy is projected to sit between \$38.3m and \$47.7m (in current terms using a 6% discount rate).

Importantly, the estimated spending is not the 'economic impact'. The net Value Added (an indicator of economic impact) difference between the area's underlying potential and a residential development is estimated at between \$3.2m and \$4.4m per year (in Value Added terms) to the Christchurch economy. In the context of the Christchurch economy, that is less than 0.02% of the City's total annual GDP. In NPV terms (@6% over 15 years), the value of shifting from rural to urban (residential) is estimated at between \$31.7m and \$42.4m.

Not all of these effects are 'new' and some of the growth could be located at other sites around Christchurch and any comparison of the economic value of the site has to reflect potential transfer effects. Assessing the effects of the development in a wider context is beyond the scope of this assessment. Such a wider assessment would need to include and compare alternative locations. If the residential development can be delivered elsewhere then the associated economic effect will still be felt in the city (but generated elsewhere).

In such an event the economic effects associated with the residential development will be generated from another locality in the City. This means that it is necessary to view the development opportunities at Cranford Basin in a city-wide context. This wider perspective includes not only (potential) alternative sites but also how the development would fit into the urban form. Crucially, the decision to alter the zoning needs to include a range of perspectives, not just economic views. When development is enabled, it tends to unlock a series of economic influences and effects. Some of these effects are durable, lasting for a long time. For example, infrastructure might be delivered in response to change. Infrastructure investments are costly and expensive to reverse. It is therefore crucial to ensure that the decision to allow (decline) a specific change is based on sound evidence base that considers an appropriate perspective.

2.2 Efficient urban form

An efficient urban form is important from planning and transport perspectives as well as an economic perspective. Access to people, goods, services and information forms a key part of the economic system. The more efficient this access, the greater the economic benefits through economies of scale, agglomeration effects and networking advantages. An important consideration when assessing the potential economic effects of a zone change is the potential contribution the change could make toward improving urban form. This section offers some *comments* on the economic implications of urban form and how a residential development in the Cranford Basin could contribute toward an efficient urban form.

The area that is earmarked for rezoning (from rural to urban) will contribute towards an efficient urban form by filling in an area, improving the urban form. From an economic perspective, this is important because it reduces, limits and avoid unnecessary (and wasteful) economic transactions while freeing up resources for more productive use(s). Some of the key benefits that will arise from a better urban form include (but aren't limited to):

- Lower per capita transport costs (internal fixed costs such as vehicle cost and residential parking; internal variable costs such as travel time, vehicle operation and crash injuries; and external costs such as accident risk, congestion, parking costs and environmental externalities/costs).

- Lower per capita travel times (such as the movement of people between their place of residence, places of employment and other activities such as shopping and leisure),
- Lower per unit infrastructure costs (including water, roads, telecommunications and other),
- Reduced land consumption and reduced loss of open space/rural land,
- Improved environmental outcomes (e.g. lower emissions and improved energy usage),
- Improved efficiencies¹² in public transport and public service delivery.

Developing the land in the Cranford Basin will provide an opportunity to improve the urban form in this location by transitioning from the rural land to the residential use. These wider effects are felt indirectly and over a long timeframe. The overall effect can be substantial so these factors need to be considered as part of Council's overall assessment.

3 Concluding Remarks

The Cranford Basin area has been identified as one potential area where a rezoning from rural to urban could facilitate, and accommodate, residential growth. However, the rezoning has to be undertaken with due consideration of the area's productive potential. Once developed it is difficult to return to the undeveloped state.

This high level overview of the proposed changes in the Cranford Basin area suggests that moving from the current agriculture activities to urban activities (particularly residential) would be interpreted as moving the land to a higher economic use i.e. residential use. Over the past decade, the area has seen little intensive activity. Since 2000 only two registered rural industry-type firms operated in the area. Agriculture, and rural industry related employment is put at less than 2, down from around 6 in 2000. This suggests that area has not been actively used for the past 15 years. The potential reasons¹³ for this are diverse and could range from agricultural-economic constraints (e.g. soil/drainage issues) to real estate market activities (e.g. land banking). In light of the low activity in the land over the past 15 years, including a period of high growth, it is argued that the overall potential of the land is probably limited as it would have been taken up if financially viable (with a sufficient return).

Our assessment compared the *potential* economic value¹⁴ of the land against that of a residential development. Based on a narrow Cranford Basin perspective, the move would generate a net positive effect that is estimated to be between \$3.2m and \$4.2m of Value Added (on an annual basis). However, we anticipate that the bulk of the economic effect will arise due to potential urban efficiency gains. We assume that these effects will be explored in detail as part of Council's overall assessment and processes.

¹² Ability to service an area relative to cost to deliver the service.

¹³ We did not explore these real estate or agricultural issues.

¹⁴ From a production perspective using a hypothetical example.