



Waikeria Prison Expansion Economic Effects Analysis

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Department of Corrections

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1 Introduction

The Department of Corrections (Department) has identified the development of a new facility at Waikeria Prison, between Te Awamutu and Otorohanga, as an appropriate response to meet the rising demand for prisoner places in New Zealand over the next decade. This approach has been agreed by the New Zealand Government. The proposal will increase the designated total capacity at Waikeria to 3,000. The increase in designated capacity will enable a new facility for 2,000 prisoners to be built and provide for future demand if needed.

In order to support the application to increase the designated capacity of Waikeria to 3,000 prisoners, the Department of Corrections requires an assessment of the economic effects of not only the proposed build and the operation of a new facility to accommodate 2,000 prisoners but also the effect of development to the proposed designated capacity. The proposed build and investment in Waikeria will be significant, current estimates put the total capital costs at approximately \$1.0bn. This is significantly more than the entire construction sector generates in a year in Otorohanga District. While the build will be spread across 2-3 years, the scale of the build is expected to generate significant new demand in the local economy, potentially stimulating growth and attracting new population.

The new facility will be procured using a design, build, finance and maintain Public Private Partnership (DBFM PPP) therefore the actual costs are not known and are likely to differ from those used to inform this assessment. The DBFM PPP does not include custodial operations, with the new facility and the existing prison being operated by the Department.

The Public Private Partnership opens the way for a large construction entity to bring in significant capacity from outside the immediate economies in order to meet the build deadlines. Given the size of the build, the private partner is likely to need to do this to ensure the build progresses and capacity becomes available in a timely manner.

1.1 Report Aims

The main aim of this report is to examine the economic effects and impacts of the proposed expansion of the Waikeria Prison through the building of a new facility for 2,000 prisoners, to trace those likely direct effects through the local and regional economies and to identify any significant adverse effects of the proposal in economic terms. An assessment of the effects of the change in designation will also be provided in summary terms. As there is no data on the actual costs of this, extrapolations from the proposed build will be used to provide the estimates.

The assessment will only be carried out on the new facility and will not include any effects arising from the operation of the current facility at Waikeria. This will provide decision makers with a clear picture of the total economic effects and impacts of the new facility on the local and regional communities and allow them to include these effects in their decision making.

We note that this assessment does not present a comparison of the costs and benefits of the decision to build a prison facility in this location. That assessment was carried out at the business case stage. However, we draw on information relied upon in the Business Case in order to remain consistent, but the aims of this report differ from the Business Case in that the focus is on the RMA relevant effects at the local, regional and national level.

1.2 Report Structure

In the remaining sections of this report we will first introduce the Prison site and place it into the local economic context (Section 2), before introducing the economic analysis approaches taken (Section 3). In Section 4 we focus on the economic effects of the new facility at Waikeria Prison, before drawing the key conclusions of the study together in Section 5. Section 6 contains all the appendices for this report.

2 Local Economic Context

Waikeria Prison is located on the border of the Otorohanga and Waipa districts, in the Waikato Region. This section provides context in terms of the structure of the local and regional economies including the nature of key activities located there. Analysing local economies gives insight into economic impacts and the degree to which direct local spend (either through capital or operating expenditure) will effect local business and workers. It provides clues as to the extent to which the proposed new facility will integrate with the local economy and the degree to which the local economy will benefit or need to change in order to meet the operational requirements of the new facility.

2.1 Population and Households

Waikeria Prison is located within Otorohanga District but on the border between Otorohanga District and Waipa District, south of Te Awamutu. The 2013 Census counted some 9,590 residents in Otorohanga District living in 3,570 households. Of this population approximately 5,430 were of working age, 2,910 under the age of 20 and 1,250 over 65. Statistics New Zealand's latest population projections have the population declining over time (under the medium projection) to reach 8,600 by 2043 of which 4,070 are working age. The over 65 portion will have almost doubled by then to 2,210 with the under 20's reducing slightly to 2,330.

Household numbers grow (under the medium projection) from 3,570 to 3,710 in 2018 before declining back to 3,570 by 2038 (when the household projections stop).

Waipa District is much larger than Otorohanga as it includes the large rural towns of Te Awamutu and Cambridge as well as abutting Hamilton City to the north. In 2013 its population was 48,700 and this is expected to grow to over 60,000 by 2043. Waipa District has a working age population of 27,010 in 2013 and this will grow to 29,240 by 2043.

The expansion of Waikeria Prison represents significant additional employment to the Otorohanga District. Approximately 930 additional custodial and support jobs will be created on an on-going basis. Currently there are around 4,440 jobs within Otorohanga, of which 2,750 are not in the primary sector. Therefore the new facility will add 16% to local job numbers and approximately 26% to non-primary sector job numbers.

These jobs are liable to be staffed by a mix of existing local residents and new people who are expected to relocate to take advantage of the employment and career opportunities provided by the prison.

2.2 Local Economy

Overall, the Waikato regional economy is dominated by primary industries with 28,300 MECs¹ working throughout the region in agriculture, forestry and fishing (13% of total employment). Of Primary Sector employees, 44% (or 10,600) are employed in dairy farming alone. Dairy farming also plays a large role in the growth of the Waikato economy. Out of the total job increase of 6,740 MECs in 5 years 2009-2014, 1,060 have been in dairy farming (16% of total growth), however Dairy Farm employment only makes up 6% of total employment. This growth drives growth in the sectors that farming supplies (milk and meat processing). These sectors have grown by an additional 980 workers over the 5 years 2009 - 2014.

Table 2-1: Employment (MEC) Structure of Otorohanga and Waipa Districts, 2016

Economic Sector	Otorohanga District	Waipa District
Agriculture, Forestry and Fishing	1,688	4,340
Mining	10	27
Manufacturing	349	2,238
Electricity, Gas, Water and Waste Services	32	118
Construction	235	2,354
Wholesale Trade	94	939
Retail Trade	217	2,120
Accommodation and Food Services	155	1,161
Transport, Postal and Warehousing	239	943
Information Media and Telecommunications	19	98
Financial and Insurance Services	30	226
Rental, Hiring and Real Estate Services	85	468
Professional, Scientific and Technical Services	234	1,431
Administrative and Support Services	73	425
Public Administration and Safety	452	371
Education and Training	246	1,847
Health Care and Social Assistance	142	1,243
Arts and Recreation Services	42	536
Other Services	95	560
TOTAL	4,440	21,450

¹ MECs: Modified Employee Count. This includes both employment count and working proprietors

At the district level the importance of dairy is even more pronounced. Primary industries (agriculture, forestry and fishing) make up 38% of the employment in Otorohanga district with 62% of these employees being employed on dairy farms (1045 MECs out of 1,690 MECs), (Table 2-1). After agriculture, forestry and fishing the next biggest employer, with approximately 450 MECs, is public administration and safety. Of these 450 employees, Statistics NZ records some 420 employed in correctional and detention services in 2016 (at the existing Waikeria Prison)² with the rest being made up of police and other emergency services. The 450 public administration and safety jobs is down from the peak in 2010 of 690 (a difference of 250 jobs). This is the largest decline seen in a sector in Otorohanga over this timeframe, yet since the year 2000 the corrections sector has grown by 75 employees.

Beyond dairy farming and public administration and safety, Otorohanga has 350 MECs engaged in the manufacturing sector, 240 in transport and logistics, 245 MECs in education and training and 220 MECs in retail trade (Table 2-1).

Table 2-2: Local and regional Employment and Business growth 2011-2016

	2010	2011	2012	2013	2014	2015	2016
Employment							
Otorohanga District	4,410	4,370	4,370	4,290	4,480	4,460	4,440
Waipa District	18,920	19,480	19,690	19,450	20,100	20,770	21,440
Waikato Region	188,670	191,820	194,950	192,630	198,010	208,855	219,700
Businesses							
Otorohanga District	1,890	1,870	1,890	1,890	1,890	1,925	1,960
Waipa District	6,960	6,910	6,880	6,830	6,960	7,100	7,240
Waikato Region	51,800	51,480	51,310	50,940	51,910	53,065	54,220

From 2010 to 2016 Otorohanga has remained relatively stable in terms of employment (+30 MEC's), while the number of business has increased by around 70 (an increase of 4%).

Waipa District is almost 5 times larger than Otorohanga in terms of employment with almost 21,440 employees compared to 4,440 MECs. Much like Otorohanga and the wider Waikato region, agriculture, forestry and fishing dominates the employment totals with 4,340 out of 21,440. However, the base is broader with manufacturing, retail, education and training and construction all key industries in Waipa District.

Table 2-2 shows the growth both locally (Otorohanga district and Waipa district) and regionally (Waikato). Otorohanga has experienced some fluctuations in employment between 2010 and 2016, however overall it has declined since 2014. Waipa on the other hand has experienced small increases consistently between 2010 and 2016, with the 2016 value being 2,520 higher than the 2010 value.

² M.E note that the Department of Corrections state that there are around 350 workers engaged at Waikeria Prison (2016).

The number of firms (GEOs³) followed much the same trends as employment in Waipa (from 6,960 in 2010 to 7,240 in 2016) while Otorohanga has seen an increase of approximately 70 businesses in this time.

In terms of Waikato region economic growth, 2,420 new businesses have been created between 2010 and 2016 with an increase of 9,341 employees (4.95% growth). By comparison, Auckland's growth over the same period was around 17%.

2.2.1 Otorohanga Economic Development Strategy

The Otorohanga long term plan⁴ indicates that the district is seeking to increase economic development opportunities *“by creating new tangible advantages for the district”*. The expansion of Waikeria Prison will pull workers to the area, as well incentivise other firms to co-locate to meet the expanded needs of an increased population and potentially, the prison. Therefore the expansion of Waikeria Prison is well in line with the districts economic goals.

This theme is supported by the Otorohanga District Development Board, an autonomous business development board, funded by Council that promotes Otorohanga as a place to live and work. Effectively they are a promotions and facilitation organisation, but the clear aim is to stimulate interest in retaining people in Otorohanga and attracting new people to live there.

The expansion of Waikeria Prison has the potential to both retain and attract people. In addition, any support activity that currently engaged in prison maintenance or supply now has the potential to bid for a significantly expanded market – given that the prison population will more than double. This will stimulate new jobs and potentially attract new businesses as well.

³ GEOs: Abbreviated from Geographic units which represent business locations

⁴ <http://www.otodc.govt.nz/assets/Uploads/PDFDocuments/Plans/Final-Long-Term-Plan.pdf>

3 Economic Analysis Approach

This report provides an assessment of economic effects, based on an Input-Output based impact assessment of building the new facility Waikeria Prison. This section outlines details of the process used. M.E note that this approach presents only the potential economic effect that could contribute to the economies of both the Otorohanga and Waipa Districts. The Input-Output approach does not replace a Cost Benefit assessment, however, the Department of Corrections have already carried out a Cost Benefit assessment as part of the Business Case process. That study identified the Waikeria site as the most appropriate in terms of accommodating the anticipated increase in prisoner numbers.

The Departments projections indicate the requirement to provide additional prisoner places in the Upper North Island. Therefore, the Department is obliged to address increased prisoner numbers in order to achieve its statutory purpose - as set out in the Corrections Act (2004), *“to improve public safety and contribute to the maintenance of a just society”*. This can be achieved by (among other things) providing prisoner accommodation near the offender’s community (Correction’s Act s6 (1) (e) &(h)).

The aim of this section of the report is to outline the approaches adopted to measure the economic footprint of extending and operating an extended Waikeria Prison in RMA terms.

3.1 I-O Approach

Assessing the economic effects and impacts of developing a new facility at Waikeria on the local and wider regional economy and people is best handled using an Input-Output approach (I-O). An I-O approach provides a large amount of information about the manner in which an economic shock, such as an injection of capital spending in an economy, flows through that economy, impacting on the turnover and performance of all businesses.

Assessing economic effects at the regional level can be carried out using a range of methodologies (such as System Dynamics and Computable General Equilibrium models as well as I-O). I-O is relatively straightforward and easy to use and is especially useful for identifying and understanding relationships within an economy, thereby allowing the path of change to be assessed. The shortcomings of I-O analysis are well understood and able to be taken into consideration and the process is good for assessing change in the short to medium term. Over the long run, price change means that an economy will trend back towards an equilibrium position that may differ from the equilibrium that existed pre development. I-O analysis does not account for price change so will not provide an answer as to the long run outcome of change.

For the purposes of this assessment, I-O is entirely appropriate especially as we have developed a Multi-Regional I-O (MRIO) framework that allows assessment of cross border flows. This MRIO recognises the fact that businesses trade across regional council borders. This means that demand increases in Waikato may actually result in Auckland based firms needing to increase their output to supply the Waikato businesses. These cross border flows

of goods and monies are captured in a MRIO in a way that an ordinary I-O model cannot do. They are therefore more accurate and better reflect the reality of a very large build project occurring in a relatively remote (in relation to the major population centres) area.

An I-O approach does have well understood and well documented limitations that relate to the snapshot approach the model takes of the impacted economies. In effect the model assumes that all relationships within the economy remain as they are currently and that impacted sectors adjust both their output and demand for additional inputs in a linear manner. An I-O approach does not take into account price change. Price change has the effect of reducing the scale of economic impact in terms of additional value add (synonymous with GDP for the purposes of this report) as it reduces the amount of consumption.

However, within the constraints identified above, I-O is an excellent tool for interpreting how an economy changes and grows. Therefore it is highly suitable for this analysis and has been applied at the regional and national level as follows:

- The direct impacts on the local and regional economies (in terms of the anticipated costs and employment resulting from the construction and operation of the new facility) have been estimated, based on data provided by the Department, covering estimated build costs and operational expenses. These monies are the direct injections into the local economy required to develop and run the new facility. For the regional economy the distribution of these funds represents changes (increases) in final demands faced by each impacted sector. It is these changes in final demands that drive the direct effects and the flow on effects (described below). The new facility is expected to be built using a public private partnership (PPP) arrangement, which means the organisation that wins the bid will build the new facility to specifications imposed by the Department of Corrections. Therefore it will have its own estimates of costs and timings that will differ from the figures used in this assessment. However, the Department have provided M.E with as much detailed costing information as they have available, (upon which the original business case was based) so that this report assessing the effects of the build on the local and regional economies is as accurate as possible.
- The 'flow-on' effects (in terms of changes to gross output, value added or GDP and employment) resulting from changes in final demand described above, are the effects generated when a business purchases additional goods and services from its suppliers to meet increased demand for the goods they sell. In turn, the supplier industries purchase more from their suppliers, and so on up the chain. These transactions are indirectly driven by the injection of capital from the government (and are termed the 'indirect effects'). The I-O model estimates these effects by factoring up production by overall changes in final demands faced. These effects occur both within the local economy (at the TA level) and across the wider region and probably rest of New Zealand economy. To model this M.E use an MRIO that traces cross border flows at the sector level.

- Companies either directly or indirectly affected pay additional wages and salaries to either new employees or to cover overtime caused by the increased production output required. This money stimulates additional spending in the economy. These are termed the ‘induced’ effects and are also captured through the MRIO analysis.
- Taking all of this into account allows us to assess the total economic effects (i.e. the direct, indirect and induced effects) of the proposed new facility, across economic sectors and through time (which can then be discounted to current terms or net present values).
- It is important to ask the “who pays?” question when assessing effects from large investments. If the monies would have otherwise been spent in the district or region, then there may be little or no net additional benefit between the building of the new facility, and an alternative use of that money within the region. That is not the case here. The money required to build the new facility will come from central government, effectively paid for by all New Zealanders. If the new facility is not going to be built at Waikeria, it will be built elsewhere and no corresponding other project would be built in its place. This means it is possible to treat all of the expenditure that flows into Waikato region (in Otorohanga and Waipa Districts) as net additional to those economies. The jobs the new facility supports are therefore all new and the flow on effects to other businesses are also additional.

The results of the economic impact assessment process are measured in Gross Output (\$2007m), Value added (\$2007m) and Employment (MECs). Note that the impacts on gross output and value added presented in this section are in constant 2007 dollars (\$2007). This reflects the fact that the MRIO table used in this study is based on the 2007 year. For a detailed description of the methodology employed in this study, refer to the technical discussion contained in Appendix 1.

4 Waikeria Prison Economic Effects

In this section we assess the economic footprint and economic effects of the prison development to accommodate 2,000 additional prisoners. As discussed above, the economic effects arise from both the construction and the operation of the new facility over time. These effects have a very different profile, in terms of their timeframe and also the sectors in which the effects are most likely to be felt. At this point, construction is anticipated to take 2-3 years with spend highly concentrated in the non-residential construction sector (albeit, not exclusively). Once operational the economic footprint of the new facility changes, staff wages and salaries tend to dominate so the local effects arise from the induced spending in the community wages sustain. Other key areas of spend are on repairs and maintenance and ad hoc spending to meet daily needs. It is likely (discussed below) that the majority of the large amounts of spending will be captured in national level contracts to supply. While that often results in effects arising outside of the region much of what is needed to run the new facility is likely to be sourced from within Waikato Region.

4.1 Direct Costs

The largest cost for the New Zealand government is the approximately \$1.0bn needed to carry out the construction and outfitting of the new facility. These costs are effectively borne by the taxpayer, so are spread across the entire country. It is unlikely that there would be a significant difference between the costs of building at Waikeria and at any other alternative locations (Spring Hill Corrections Facility or in Auckland) given that the eventual builder will be purchasing materials and labour on a national scale due to the size of the project. Any differences in cost would have been taken into account at the Business Case stage, but it is important to note that costs are unlikely to differ significantly due to location.

Also it is important to note that the actual cost of the build may differ from that modelled here given the constructing entity has yet to bid on the work let alone be appointed. The extent to which the final direct costs differ from those modelled here will also apply to the economic impact results.

In addition to the monetary cost to the tax payer, there are opportunity costs associated with the new facility. These have not been captured or quantified in this report, but are recognised. Once the land is occupied by prison buildings, it cannot be sold and/or used for other employment generating purposes. Currently the land upon which the new facility is to be built is operating as part of a large dairy farm. The current Waikeria Prison operates on a small portion of the 1,278ha farm and the new prison facility will occupy up to 78.2ha.

4.2 Direct Effects

The first task is to establish the direct spend on construction and operation of the new facility within the Waikato economy. Figures provided by the Department of Corrections covering; estimated construction costs and timings, fit-out costs and professional fees were used in

combination with details from a similar earlier (2010) assessment of Auckland South Corrections Facility. This included information on staffing ratios and other costs. Operational cost ratios (sourced from the business case) have been used to establish the full scale of cost and the timing of capital and operational expenditures. Note that all costs quoted in this section are in current 2016 dollars (\$2016). In the I-O framework, they will be discounted back to 2007 dollar terms before being incorporated into the model.

4.2.1 Construction Effects

The construction of a facility accommodating 2,000 prisoners at Waikeria is expected to be completed in 2021. The total cost of the new facility is estimated at approximately \$1.0bn. It is estimated that around 11% of the total expenditure is heavy and civil engineering construction, including site preparation and earth works.

Without detailed knowledge of the location of providers of design services or fit out suppliers it has been assumed they are based in the Waikato region and therefore we have assumed a typical Waikato construction firms supply chain. Altering this assumption will lower the positive impacts in the Waikato and increase the positive impacts in the rest of New Zealand. In addition, if some of this money is spent offshore it reduces the impacts on the national economy.

During the construction phase (2018-21, inclusive) the new facility is anticipated to sustain employment equivalent to approximately 1,960 full time jobs for a year in the Waikato Region. On average, approximately 490 full time job equivalents each year. Note that the majority of construction occurs in 2019 and 2020 (73%) so the effects are not evenly spread through time. In 2016 there were 1,040 workers who worked in non-residential building construction within the Waikato Region. The construction of the new facility will require employment equivalent to 45% of the current regional labour supply. A build of this scale, potentially requiring a large proportion of the current resources is likely to lead to price rises. Construction workers will be able to raise their salary and wage demands and this will attract more workers into the region to take advantage of those increased wages. It will also generate interest in both currently unemployed workers and those in other industries who may choose to switch – as well as those currently in training or education to look to this sector for employment. At this stage it is too early to assess the potential skills requirements for the build, but there is scope within the construction phase of this project for training organisations, and construction firms to coordinate the provision of skilled workers in a timely manner. This approach has been carried out successfully at Auckland Airport as part of their redevelopment process and will be put in place for the Tamaki Redevelopment Project.

It is not known at this stage who will build the new facility or where the workers who will build the facility will live. It is often the case that large construction contracts are won by operators based outside the region. This means that inevitably a portion of the employment will be based outside the region. However, most construction employment is local therefore it is anticipated that the majority of this employment will occur within the Waikato region. As mentioned elsewhere this is likely to be a mix of local workers who currently reside within the Waikato and workers who move into the region for the duration of the build – or longer.

4.2.2 Operational Effects

Based on ratios provided by the Department, it is anticipated that the new facility (which will accommodate 2,000 prisoners) will employ approximately 595 custodial staff, 335 prison support staff for a total of 930 workers. For the purposes of this report it has been assumed that these are all full time workers and are employed in proportion to the 'ramp up' schedule for prisoner occupation.

It has been assumed that once the new facility is operational there will be a total of 2,650 prisoners including the existing 650 prisoners. If there are fewer prisoners on the site, employment needs are likely to be lower.

As with the construction phase, it is not possible to know where these staff will live, however a significant number will reside within Otorohanga/Waipā Districts. This means that wages that are paid are more likely to be spent locally sustaining local businesses, generating a second round of impacts in the economy.

Annually, based on staff numbers and annual income for prison staff in Waikato, it is expected that the wage bill associated with the new facility will be approximately \$60m, the vast majority of which will be available to local households to spend locally – driving further rounds of impact discussed below.

In addition to expenditure on wages and salaries the prison as an entity purchases goods and services from local and regional businesses. Even in circumstances where the Department has national contracts with suppliers, the goods and services are often secured locally – certainly within the region, given that the Waikato regional economy is large and sophisticated. It has therefore been assumed that all requirements for the prison extension will be met from within the region. This simplifies the analysis and while the final outcome may differ slightly from this position, it will not do so in a manner that would cause concern.

In this instance, the prisons costs can be segmented into four broad categories;

- **Prisoner demand cost:** includes direct operating costs such as food, clothing and bedding, laundry and kitchen services, healthcare, prisoner movements, education programmes, facility administration as well as regional and national overheads and administration.
- **Facility management;** property management and maintenance including cleaning, grounds maintenance, pest control, plumbing etc.
- **Rates and insurance,** and
- **Lifecycle costs;** relating to the replacement of capital assets over time.

Operating at full capacity, the new 2,000 prisoner facility at Waikeria is expected to have an annual average expenditure of \$150m.

4.3 Economy Wide Effects

The total net economic impacts (i.e. direct, indirect and induced effects) of the proposed facility are presented in this section. That is, the effects of the money paid in wages and salaries and to suppliers to the new facility as it flows through the regional economy. Note that the impacts on gross output and value added presented in this section are in constant 2007 dollars (\$2007). This reflects the fact that the MRIO table used in this study is for the 2007 year.

Construction Effects

The construction of the new facility will facilitate flow on (indirect and induced) effects throughout the economy. The cumulative gross output effect, that is the direct injection plus the flow on effects, felt within Waikato region across the 4 construction years is estimated at \$1.6bn, sustaining the employment equivalent of 7,700 jobs years. The value added component of the total effects sum to approximately \$500m. When extended across New Zealand, these numbers increase to \$2.5b (gross output), 12,600 equivalent job years and \$890m (value added). Although this is simply a measure of the effect of spending this amount of money within New Zealand across these construction sectors. At the national level, if the government decided to not build the new facility, it is likely the money would have been spent on another project with similar impacts. Therefore the national figures – while of interest, do not necessarily reflect any additional activity.

The full set of construction effects, split by effect type, region and year are found in Table 4-1. The dollar values for the shock, gross output and value added in this table are measured in \$2007m. The 'shock' in the table below relates to the \$1.0bn of capital costs required to build the new facility, by translating the build cost into \$2007 terms. This shock then drives the economic impacts through the I-O process. The total employment effect peaks in 2020 with nearly 4,800 equivalent job years being sustained nationwide by the construction of the proposed prison extension. This year also has the highest gross output effect (\$960m) and value added effect (\$339m).

Table 4-1: Total Construction Effects – Waikeria (\$2007m)

	2018	2019	2020	2021
Waikato Region				
Shock	\$ 124	\$ 265	\$ 286	\$ 78
Gross Output	\$ 269	\$ 577	\$ 622	\$ 170
Value Added	\$ 83	\$ 177	\$ 191	\$ 52
Employment	1,268	2,720	2,931	803
Rest of N.Z.				
Shock	\$ -	\$ -	\$ -	\$ -
Gross Output	\$ 146	\$ 314	\$ 338	\$ 93
Value Added	\$ 64	\$ 138	\$ 148	\$ 41
Employment	801	1,717	1,850	507
Total New Zealand				
Shock	\$ 124	\$ 265	\$ 286	\$ 78
Gross Output	\$ 416	\$ 891	\$ 960	\$ 263
Value Added	\$ 147	\$ 315	\$ 339	\$ 93
Employment	2,069	4,437	4,781	1,309

Operational Effects

Total economic effects arising from the operation of new facility are displayed in Table 4-2, below. The ongoing operation of the Waikeria extension results in an average \$330m of gross output, \$180m of value added and 2,640 equivalent job years each year between 2022 and 2031 at the national level. The Waikato region experiences around half of the total effects, with \$210m of gross output, \$125m of value added and 1,950 local equivalent job years generated by the operation of the proposed extension to the prison.

4.3.1 NET PRESENT VALUE

A Discounted Cash Flow (DCF) analysis was used to express the overall economic effect of the construction and operation of the new facility at Waikeria prison over a 14 year period (2017-2031). Note that the discount period is constrained to the extent we are comfortable projecting the economic models – in this case to 2031.

The DCF expresses the value of cash flows in ‘current’ or today’s terms (net present value or NPV). NPV takes into account the fact that money now is more valuable than money in the future, and therefore each annual value added effect is ‘discounted’ (at 7.15%⁵ per annum) to reflect its equivalent value today. These discounted annual value added figures are then added together to gain a single value.

The NPV of value added or GDP contributed to the Waikato economy between 2017 and 2031 is \$1.2b. The total contributed to the New Zealand economy over the same time period is \$1.8bn. Obviously, as discussed above, at the national level, the additional economic activity is offset by costs associated with funding both development of the new facility and its operation.

⁵ The specific rate used by the department in its Business Case

Table 4-2: Total Operation Effects – Waikeria (\$2007m)

		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Waikato Region													
	Shock	\$22	\$95	\$118	\$118	\$118	\$119	\$118	\$125	\$132	\$134	\$142	\$137
	Gross Output	\$41	\$176	\$217	\$217	\$217	\$220	\$218	\$230	\$244	\$248	\$263	\$253
	Value Added	\$24	\$104	\$128	\$128	\$128	\$130	\$129	\$136	\$144	\$146	\$156	\$150
	Employment	379	1,618	1,992	1,993	1,992	2,015	2,000	2,111	2,241	2,271	2,415	2,319
Rest of N.Z.													
	Shock	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
	Gross Output	\$23	\$98	\$121	\$121	\$121	\$122	\$122	\$128	\$136	\$138	\$147	\$141
	Value Added	\$10	\$45	\$55	\$55	\$55	\$56	\$55	\$58	\$62	\$63	\$67	\$64
	Employment	134	573	706	706	706	714	709	748	794	804	856	821
Total NZ													
	Shock	\$22	\$95	\$118	\$118	\$118	\$119	\$118	\$125	\$132	\$134	\$142	\$137
	Gross Output	\$64	\$275	\$338	\$338	\$338	\$342	\$340	\$359	\$381	\$386	\$410	\$394
	Value Added	\$35	\$149	\$183	\$184	\$183	\$186	\$184	\$194	\$206	\$209	\$222	\$214
	Employment	513	2,191	2,698	2,698	2,698	2,729	2,709	2,859	3,035	3,075	3,271	3,140

Note: The dollar values in the above table are in \$2007m and employment measured in MECs

4.4 Proposed Change in the Designation to 3,000

Finally, it is necessary to provide some indication as to the effect of the proposed change in the designation in total. This is problematic in that the manner in which the department may handle additional prisoners is not fixed in any way and there are a wide range of options available to them. This means that any assessment of the costs associated with additional prisoners is purely speculative. However, what is clear is that the costing and impacts presented below are likely to represent a maximum level of effect.

Currently Waikeria Prison has a muster of around 650 prisoners with a designation of 1,250. The proposed change in designation is to raise the total allowed from 1,250 to 3,000 prisoners. This will provide the department with a degree of flexibility in terms of managing their overall asset and accommodation spaces.

There is no formal costing for a build of this scale (if a build is required), therefore the impacts have been assessed in a summary manner by extrapolating the proposed build as outlined above (i.e. a 2,000 prisoner place facility) to 2,350 prisoner spaces. In doing so some aspects have been left the same (costs such as design and consenting etc. would not be likely to cost more).

A build to accommodate 2,350 under these assumptions is likely to cost around \$1.1bn, generate construction related GDP contributions of \$570m in Waikato Region, while sustaining Regional employment equivalent to 2,200 full time jobs each year during construction. Operational effects of the larger prison are likely to generate a contribution to GDP in Waikato of \$1.7bn in total, sustaining employment equivalent to 2,230 full time workers each year.

Table 4-3: 2000 and 2350 build comparison

		2000 Build	2350 Build
Total regional construction effects	GDP effect (\$2007m)	\$ 500	\$ 570
	Employment effect (MECs)	1,540	2,200
Annual regional operational effects	GDP effect (\$2007m)	\$ 125	\$ 144
	Employment effect (MECs)	1,945	2,230

Please note that these effects are speculative and highly uncertain due to the uncertain nature of the costings used. They have been generated to provide an upper limit to the economic effects likely to occur should the current build be expanded to accommodate additional prisoners. Market Economics note that no such plan currently exists to do so and that the department has a range of alternative accommodation options available to it that are likely to cost less. These costs must be treated with caution.

5 Conclusions

In total, the construction of the new facility will generate over \$500m in value added to the Waikato region – most of this concentrated in Otorohanga and Waipa. In addition, almost \$390m is generated across the rest of New Zealand. The build phase will sustain the employment equivalent of 1,960 workers working for a full year. In total, once the operational expenditure is added, the prison is expected to generate contributions to GDP equivalent to \$160 million annually.

The Department is proposing to increase capacity of Waikeria Prison to allow the construction and operation of a new facility. The Department anticipates that the prison will cost approximately \$1.0bn to build and fit out with construction beginning in the second quarter of 2018 directly generating an estimated 1,960 full-time job years between 2018 and 2021 during the construction phase. The new facility is expected to be built using a Public Private Partnership. This means that the exact distribution of economic impacts and effects along with costs and staffing levels are not known. However, it is likely that a large portion of the resources required to build the new facility (labour, supplies and expertise) will be sourced from the regional economy.

The construction of the proposed extension to the facility will stimulate a significant amount of additional activity in the Waikato and rest of New Zealand economies. In total, 7,720 full time equivalent job years are expected to be sustained in the Waikato regional economy and an additional 4,870 across the rest of New Zealand. The direct expenditure is likely to be new or net additional spend in the Waikato Region. Therefore, through the construction phase the build generates \$174m in direct contribution to value added or GDP in Waikato Region. Once the flow on effects of the construction phase are included, a total of \$500m in contribution to GDP across the region and \$390m across the rest of New Zealand is generated.

At full occupancy, the Department anticipates that the new facility will cost (on average) \$150m (\$2016m) a year to operate. Although it is not possible to predict the exact location of the operational spend, the majority is expected to accrue to businesses and households in the Waikato region – specifically in the Otorohanga District and southern parts of the Waipa District.

The flow-on effects resulting from the anticipated spending on construction and operation of the proposed new facility have been estimated using an MRIO table for the 2007 year. These have been added to the direct spending impact to estimate the net economic impact of the proposed prison. The estimated net impact on the Waikato region economy is strongly positive. It consists of an additional \$1.5 billion in total value added between 2018 and 2031 (at an average of \$125m a year) sustaining the equivalent of an additional 23,350 worker years of employment in total (at an average of 1,950 a year).

The effect of the proposed change in the designation up to a total of 3,000 prisoner beds is less certain and based solely on extrapolating the impacts of a 2,000 prison bed build to 2,350

(3,000 minus the 650 currently resident on the Waikeria site). Under these assumptions the Waikato Region could expect GDP contributions during construction to be \$570m in total plus the operational impact of \$1.7bn over the 2020 – 2031 time frame (\$144m on average, annually).

6 Appendices

Appendix 1: IO Modelling

For this project M.E used a 2007 based I-O model, which essentially captures a quantified picture of interactions across the New Zealand Economy at a point in time. To reflect the needs of this project, the 2007 I-O has been aggregated into 2 regions (Waikato and Rest of New Zealand), and 106 economic sectors. The data for the model has been sourced from Statistics NZ.

Input-Output models replicate the transactions and purchase patterns within an economy expressing these in tabular format. These tables form the core of any I-O modelling and they reflect the flows of money or goods among various sectors or industrial groups within an economy (or between economies).

These flows are recorded in a matrix or 'I-O table' using arrays summarising the purchases made by each industry (its inputs) and the sales of each industry (its outputs) from and to all other industries and sectors of final demand. Using the information contained within such a matrix, I-O practitioners are able to calculate mathematical relationships for the economy in question. These relationships describe the interactions between industries, specifically, the way in which each industry's production requirements depend on the supply of goods and services from other industries. With this information it is then possible to calculate, given a proposed change (such as a new development) to a selected industry, all of the necessary changes in production that are likely to occur throughout supporting industries within the wider economy.

As with all modelling approaches, I-O analysis relies on certain assumptions for its operation. A central assumption in I-O modelling is that the input structures of industries (i.e. technical relationships) are fixed. In the real world, however, these technical relationships do change due to new technologies, price shifts and input substitutions, and the introduction of new industries. Therefore, I-O analysis is generally regarded as suitable for short-run analysis, where economic systems are unlikely to change greatly from the initial snapshot of data used to generate the base I-O tables.

M.E's standard I-O structure has 106 sectors – this can be expanded both geographically and based on commodity flows to over 120 sectors (the assessment used in this report is based on the standard 106 sectors) and all New Zealand's regions.

The resulting 106 sector table reflects the economic structure and economic interrelationships between the 16 regional councils in New Zealand. The I-O table used in this project has been regionalised, utilising the Generating Regional Input-Output Tables (GRIT) procedure, to reflect the geographical structures required for this project. The regionalised table reflects 5 regions (Auckland, Bay of Plenty & Waikato, Wellington, Christchurch and Rest of New Zealand) and how the sectors within each region are

interconnected with each other and with sectors in the rest of the economy. In other words, these tables explain the supply chain interdependencies between sectors across the country.

Input-output analysis has strengths and weaknesses. Compared to some other economic models, I-O is relatively straightforward and easy to use. It is especially useful for identifying and understanding the nature of relationships within an economy but it provides a snap-shot rather than a dynamic picture of the relationships among industries. These relationships are assumed to remain stable/static over time. This assumption implies that the sectors' input structures remain static through time and that the type of technology used during production remains stable. In the real world, however, technical relationships will of course change over time as a result of new technologies, relative price shifts and product substitutions, and the introduction of new industries. Therefore I-O modelling is not suited to long run analysis of change.

I-O modelling also assumes that there are sufficient resources of labour, land and capital to sustain projected growth or change, and that growth in one industry does not constrain growth in others (for example, through competition for labour or capital, affecting the supply and/or price of these).