



Waikato Economic Development Strategy

Growth Goals Assessment

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Summary

As part of preparing the Waikato Economic Development Strategy (EDS) a set of potential growth goals was assessed. Three main goals, with six variations each, were analysed reflecting the general direction and high level inputs from the Governance Group. The results were reviewed and a suggested option (growth goal) was selected based on the achievability of that goal. The results and suggested goals were presented to the Governance Group at a 20 September 2013 meeting and some additional refinements were made to the goals after the presentation culminating in the Growth Goal presented in the EDS Discussion Document.

The methodology used to assess the Waikato growth goals is similar to the one used for Auckland Council and the Ministry for Business, Innovation and Employment (MBIE; then MED) in assessing Auckland's Growth Goals. This process was undertaken in two distinct steps. In the first step the outlook for Waikato's economic production per person (Value Added per Capita) was estimated and compared with other regions throughout NZ. This information was then used to derive a 'required growth rate' that would result in lifting Waikato's relative position *vis-a-vis* the other regions throughout NZ. This step relied heavily on work undertaken by other economic consultancies (including NZIER, BERL and Infometrics). In the second step, changes in sectoral exports, investment and productivity that would translate into the Waikato economy achieving the required growth rate were estimated. This was done by setting the 'new Value Added per capita' as target and using Excel's 'Goal Seek' function to estimate the factor by which performance should lift to hit that target. Importantly, exports, productivity and gross fixed capital formation were used as drivers of change (i.e. the source of additional economic growth). Our analysis captured the *direct* (growth in output in the key sectors), *indirect* (through supply chains) and *induced* (through consumer spending) linkages. Finally we evaluated the results and suggested a set of growth requirements – a suggested growth goal.

It is important to realise that this growth goals work does not capture the potential growth limits that environmental and ecological resources may impose. It is not possible to model the economy-environment interface using (currently) available¹ models. It is important to note that the economy-environment interactions are dynamics with feedbacks between the systems. These feedbacks are characterised by non-linearities (and potential tipping points), lags and complex cause-effect relationships which may produce emergent behaviour not captured in the current model.

Suggest Goals, Productivity and Labour Constraints

The modelling suggests that labour constraints are a very real issue and that current labour pressures (e.g. difficulty finding suitably qualified staff) are likely to intensify as the economy grows. This implies that the suggested goal could capture a mixture of inputs (e.g. export

¹ We are aware of research being undertaken to develop models that could reflect economy-environment interactions and the associated trade-offs.

growth, productivity growth and gross fixed capital formation). Based on the analysis, we suggest the following growth goal:

- To lift VA per capita growth to 2.8% per year² so that the Waikato region will be in the top third³ of regions in NZ in terms of economic performance. To do this it will be necessary to:
 - Lift productivity by 1% per year.
 - Grow international exports by 1.5% per year, or put differently lift exports by 35% by 2031.
 - Lift VA in the key sectors by 80% (2012 – 2031). This will require annual growth (compounded) of around 3% in the key sectors.

A by-product of lifting economic output will be an increase in demand for labour. While not a goal in itself, it is estimated that increasing economic output (in-line with the above drivers) will require around 80,000 additional employees by 2031. This equates to around 4,200 new jobs per year. As mentioned earlier, labour constraints and associated issues are important considerations that will need specific attention and presumably this will be informed by the EDS.

The results from the analysis shows that attaining VA growth around the 2.5% mark is achievable but will require increases in exports, investment and productivity. Achieving this growth will be a stretch but it is achievable. Pending projects, such as the Ruakura Inland Port, will assist in moving the economy onto a higher growth path.

² This is a lift of 60% between 2012 and 2031.

³ This is the same as the 'Top 3 goal' but with Auckland and Wellington excluded. There are 16 regions and the top 5 equals to the top 31% - roughly a third.

1 Introduction

The Waikato region is in the process of developing the Waikato Economic Development Strategy (EDS). This process is being overseen by a Governance Group (GG). Martin Jenkins (MJ) has been appointed to assist them with developing the EDS. Market Economics (M.E) was commissioned to provide assistance with the growth goals part of the EDS process. This paper summarises M.E's process and methodology, the key findings and the suggested growth goals.

1.1 Process

As a first step, M.E prepared a basic outline showing the type of indicators and parameters that could be included as growth goals and presented these to the GG (23 August 2013). At this meeting the GG provided general direction about the type of goals and objectives that it wanted to explore and M.E prepared the growth goals based on this direction. Specifically, the GG provided the following general direction:

- Use economic activity per capita as core indicator,
- Use an array benchmark regions and include a like-for-like benchmark, a 'top-performers' benchmark and a New Zealand benchmark,
- Use different timeframes e.g. 'achieve goals in 10 years' and 'achieve goals by 2031'; and
- Accelerate growth to close the gap/difference (with similar regions).

In addition, the GG provided direction about how the required growth could be achieved. For example:

- The focus could be on the region's key sectors⁴,
- Add value locally before exporting goods, and
- Increase foreign direct investment.

Using the above direction, M.E defined 18 growth goals based on different exports, gross fixed capital formation and productivity growth rates. We modelled each growth goal and assessed the results for achievability. The results and a suggested goal(s) were presented to the Governance Group (20 September 2013). After this presentation some additional targeted inputs were requested. These were dealt with by way of further analysis and inputs. The additional work was mostly about refining and verifying the initial findings.

⁴ As identified by MJ.

1.2 Methodology

The methodology used to assess the Waikato growth goals is similar to the one used for Auckland Council and Ministry for Business, Innovation and Employment (MBIE; then MED) in assessing the Auckland Growth Goals. This process was undertaken in two distinct steps.

Step 1: Growth Goal – Required Growth

In the first step we estimated the *total* growth required for the Waikato to match the economic performance (expressed in VA per capita terms) of other NZ regions. However this required an indication of the likely future position of the comparator regions. Estimating the VA per capita of the comparator regions was done using economic data from a range of economic consultancies and the data was standardised allowing a direct comparison. We used information from government departments, universities, development agencies and other economic consultancies, including:

- New Zealand Institute of Economic Research (NZIER),
- Infometrics,
- BERL,
- The Treasury,
- The Ministry of Business, Innovation and Employment,
- New Zealand Transport Authority,
- Canterbury Development Corporation, and
- Lincoln University (Agriculture and Economic Research Unit – AERU).

We estimated 2031 VA (GDP) per capita for all regions using available data and the Waikato outlook was compared against the other regions and following three options (targets) were identified.

- The ‘Number 1 region in NZ’ (have the highest VA per capita),
- ‘Within the Top 5’ regions (Waikato moves up 5 places in the VA/capita rankings), and
- ‘Within the Top 3’ regions (excluding the main regions of Auckland and Wellington).

Next the change required (in Waikato’s VA per capita) to match the other target regions was calculated. We set this ‘new VA per capita’ as the target and, using Excel’s ‘Goal Seek’ function derived the sectoral growth rates required to achieve the target. Exports, productivity and gross fixed capital formation were used as growth drivers (i.e. the source of additional economic growth).

An important assumption is that that all structural relationships between sectors remain constant. This means that additional growth in key sectors will lead to changes in non-key

sectors. Further, structural interdependencies⁵ between the key sectors will also lead to additional growth between key sectors.

Step 2: Suggested Growth Goals.

In this step we reviewed the results and considered labour constraints (participation rates) to determine the achievability of each goal. Based on these results we suggest a growth goal.

1.3 Caveats and Limitations

There are a number of important caveats and limitations which must be understood and evaluated before policy makers can use this analysis⁶.

1.3.1 Suggested Goal

We note that Market Economics is merely providing data from which the attainability and reasonableness of each goal can be measured as part of the EDS development process. We do not support or endorse the goals as defined in this study.

1.3.2 Restraints on Growth

The modelling in this study was conducted at an aggregate Waikato region level (i.e. the region as a whole). Given the time constraints it has not been feasible to assess micro-level implications. There may be a number of constraints that inhibit Waikato's ability to exploit all development and growth opportunities. For example, there may be binding input constraints with respect to labour force (quality and quantity considerations), capital (foreign investment, domestic savings), land supply (zoning and metropolitan boundaries) or foreign inputs. Another possible constraint to growth may include institutional issues (e.g. government policies, management capability) and approaches towards environmental and social impacts. Other potential constraints include infrastructure issues, such as transportation bottlenecks (road, rail, sea and air). For example, the inland port at Ruakura may commence earlier (or later) than planned changing the economic structure of the region. Our assessment is not an economic impact assessment. In addition, there may also be demand constraints (domestic and international).

The modelling undertaken for this work acknowledges the connections between the environment and economy. These connections influence the level of economic production that can be undertaken before environmental limits and degradation start to reduce output levels. We believe that there are some key questions that need to be answered as part of further research and investigation:

⁵ The Economic Futures Model (EFM), the model we used for this assessment, captures these inter-industry feedbacks i.e. not only the direct (growth in output in the key sectors), but also indirect (through supply chains) and induced (through consumer spending) linkages.

⁶ Although every effort has been made to ensure accuracy and reliability of the information contained in this report, neither Market Economics Limited nor any of its employees shall be held liable for the information, opinions and forecasts expressed in this report.

- Are there enough resources (appropriately skilled labour, investment capital, available land, appropriate infrastructure/energy/water etc resources) available to allow production growth to reach the goal? Further is there sufficient water and land resource available to support addition primary sector growth?
- Would national and local institutions or government allow this level of growth in light of potential environmental and social externalities (potential environmental degradation and social inequality)?
- Tradeoffs with other objectives that may be desirable i.e. can the economic growth goals be achieve at the same time as, say, a 40% reduction in CO₂ emissions?
- What are the implications for the Waikato economy of shifts in the global economy e.g. Global Financial Crises and how exposed is the economy to external shocks e.g. Botulism scare?

1.3.3 Base Year and Information

This assessment used the Waikato Economic Futures Model (EFM) to assess the different growth goals. The version we used is scaled to 2011 but the underlying base of the model is 2006/7. We note that in estimating regional GDP per capita we used 2010 as base year expressed in 1995/6 terms. This reflects a large portion of the data used in estimating regional GDP/capita. This work has combined many data sets from various sources which may have slightly different characteristics. In the given time frame we have been unable to verify that all the data sets are entirely consistent but we are confident of broad consistency. Areas where differences may occur include timing (some data sets maybe calendar year while others maybe June or March year-end). We use 2031 as end-point because that is the final point in the Waikato EFM⁷.

Where appropriate we combined the trends implied by different sources to present an 'average outlook'.

1.3.4 Scenarios and Growth outlook

The outlooks used to derive the growth targets are based on historic growth rates. This method has limitations, especially where regions have shown strong or weak historic growth. This technique does not attempt to model the underlying activity of economic actors in each region and as such will be a 'best approximation'. Developing detailed outlooks for each region is beyond the scope of this study.

The weakness of historic trend forecasting is that some regions will be assumed to grow by a rate which is higher/lower than would be estimated using more detailed econometric forecasting or projections. We believe that the approach used here is however reasonable given the project's time constraints, the breadth of the projections required and the initial and changing scope of this work. It is our view that the relative ranking and projections for

⁷ Efforts are currently underway to upgrade the EFM to better reflect recently published information.

each region should not be relied on in isolation. The ‘overs and unders’ for different regions will tend to offset each other, meaning that the overall goal will be a useful guide.

2 Goals and Targets

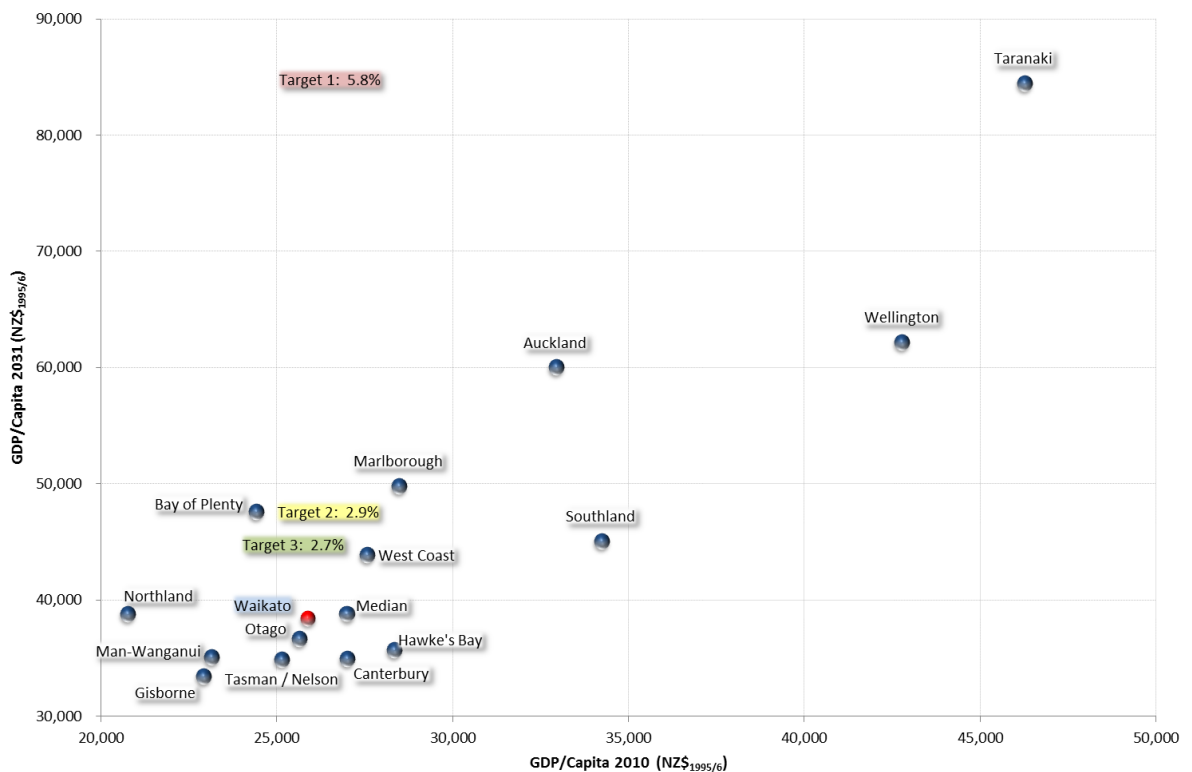
In this study we have tested 18 growth goals based around three high level goals and six variations around each. The following three goals were identified (VA/capita as an indicator):

- The ‘Number 1 region in NZ’ (have the highest VA per capita),
- ‘Within the Top 5’ regions (Waikato moves up 5 places in VA/capita rankings), and
- ‘Within the Top 3’ regions (excluding the main regions of Auckland and Wellington).

In order to achieve these goals, Waikato’s GDP per capita will need to grow by (see Figure 2.1):

- ‘Number 1 region in NZ’ 5.8%.
- ‘Within the Top 5’ regions 2.9%.
- ‘Within the Top 3’ regions 2.7%.

Figure 2.1: Regional GDP/Capita Outlook



2.1 Goals

Achieving the growth goals can be done by targeting different economic sectors. For the purpose of this assessment we used the following three variations:

- All sectors of the economy improve their performance by lifting Export, Investment (gross fixed capital formation or GFKF) and productivity growth,
- The key sectors' economic performance improve based on accelerated exports, GFKF and productivity growth, and
- Lifting the performance of non-agricultural key sectors via improving exports, GFKF and productivity.

In addition to the above variations, two productivity settings were tested. Under the first setting it is assumed that additional effort is put into lifting productivity above the trend and in the second it is assumed that productivity growth is even higher and that a 'premium' is achieved. The following table summarises the 18 growth goals.

Table 2.1: Growth Goals - Mix

Target Growth Rate (GDP per capita)	Productivity Growth			Premium Productivity Growth		
	All Sectors	Key Sectors	Non-Agri Key Sectors	All Sectors	Key Sectors	Non-Agri Key Sectors
Target Growth 5.8%	1.	2.	3.	4.	5.	6.
Target Growth 2.9%	7.	8.	9.	10.	11.	12.
Target Growth 2.7%	13.	14.	15.	16.	17.	18.

2.2 Main observations and Alignment with EDS Discussion Paper.

The findings are summarised in this section. We comment on the reasonableness and whether the outcomes are realistic. Importantly, the results presented here are for the overall economy with a selection of sectoral performances presented in appendices. Table

2.1 presents a summary of the results while Figure 2.2 shows each goal's associated growth profile. The reference scenario shown in the figure reflects a 'business as usual' growth outlook and is based on the assumption that historic trends and patterns will continue into the future. The table shows:

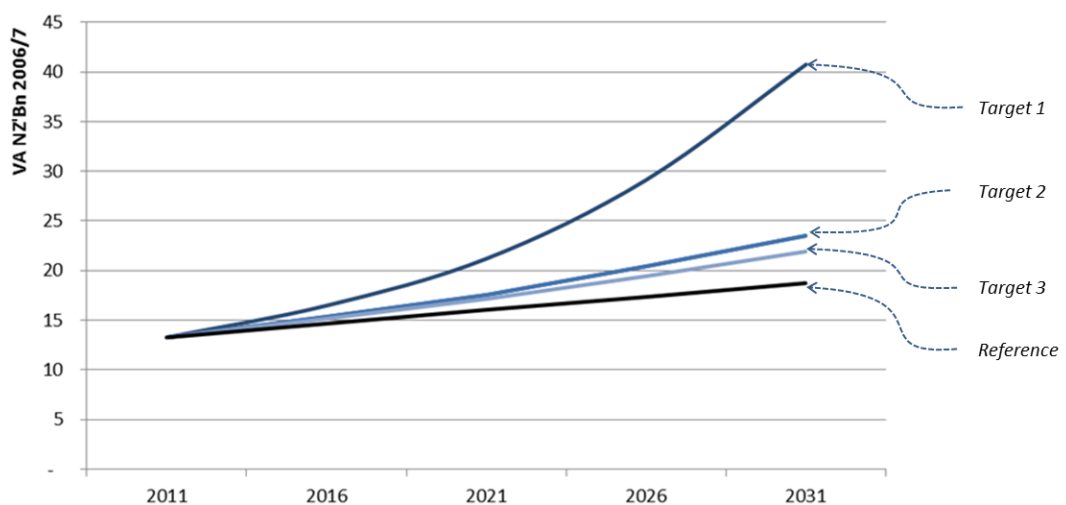
- Compound Annual Growth Rate (CAGR) in VA between 2011 and 2031.
- The CAGR in employment (using Modified Employee Counts - MECs) needed to achieve VA growth.

In addition, Appendix 1 shows the export growth rates associated with each goal.

Table 2.2: Summary of Results

Target	Sectoral Mix	Productivity	VA CAGR 2011-2031	MEC CAGR 2011-2031
Target 1	All Sectors	Growth	5.8%	4.3%
		Premium		3.8%
	Key Sectors	Growth		4.9%
		Premium		4.7%
Non-Agri Key Sectors	Growth	5.2%		
	Premium	4.9%		
Target 2	All Sectors	Growth	2.9%	2.0%
		Premium		1.8%
	Key Sectors	Growth		2.1%
		Premium		2.0%
Non-Agri Key Sectors	Growth	2.2%		
	Premium	2.1%		
Target 3	All Sectors	Growth	2.5%	1.7%
		Premium		1.6%
	Key Sectors	Growth		2.0%
		Premium		1.9%
Non-Agri Key Sectors	Growth	2.0%		
	Premium	1.9%		

Figure 2.2: Growth profile



The main observations regarding the growth goals are:

- All the growth goals associated with Target 1 are unlikely to be realised. The required growth rates are very high and are too optimistic. All these goals should be ignored based on:
 - The unrealistically high growth rates (VA).
 - Unrealistic requirements for labour. Under these goals, labour force participation is at least 130% rising to over 170%. The participation rate cannot be greater than 100% meaning that there won't be sufficient labour in Waikato to do the work associated with growing the economy in the required manner.
- Target 2 and 3 are relatively closer together requiring a VA lift of between 2.5% and 2.9%. This growth will require an associated increase in employment ranging between 1.6% and 2.2%. In all instances the resulting labour participation rate is projected to increase substantially crossing the 100% threshold in some cases. These cases are mostly related to Target 2. A key variable influencing the participation rate is productivity. Under the premium productivity settings, the participation rate is reduced – this shows the underlying importance productivity growth.
- A key implication of the modelling and results is that labour constraints are a very real issue and that current labour pressures (e.g. difficulty finding suitably qualified staff) are likely to intensify as the economy grows. One dimension of the population dynamics that could play a role in softening such impacts is migration. NZ is a multi-cultural country and if the region is successful in attracting migrants to Waikato then it could expand the labour force and in turn mitigate some labour constraints.

Table 2.3 shows the achievability of the different goals. This implies that the suggested goal could capture a mixture of inputs (e.g. export growth, productivity growth and gross fixed capital formation). Appendix 2 shows the results (VA per sector and MECs per sector) for three growth goals. The results are shown for goals 10, 17 and 18 (as identified in Table 2.1).

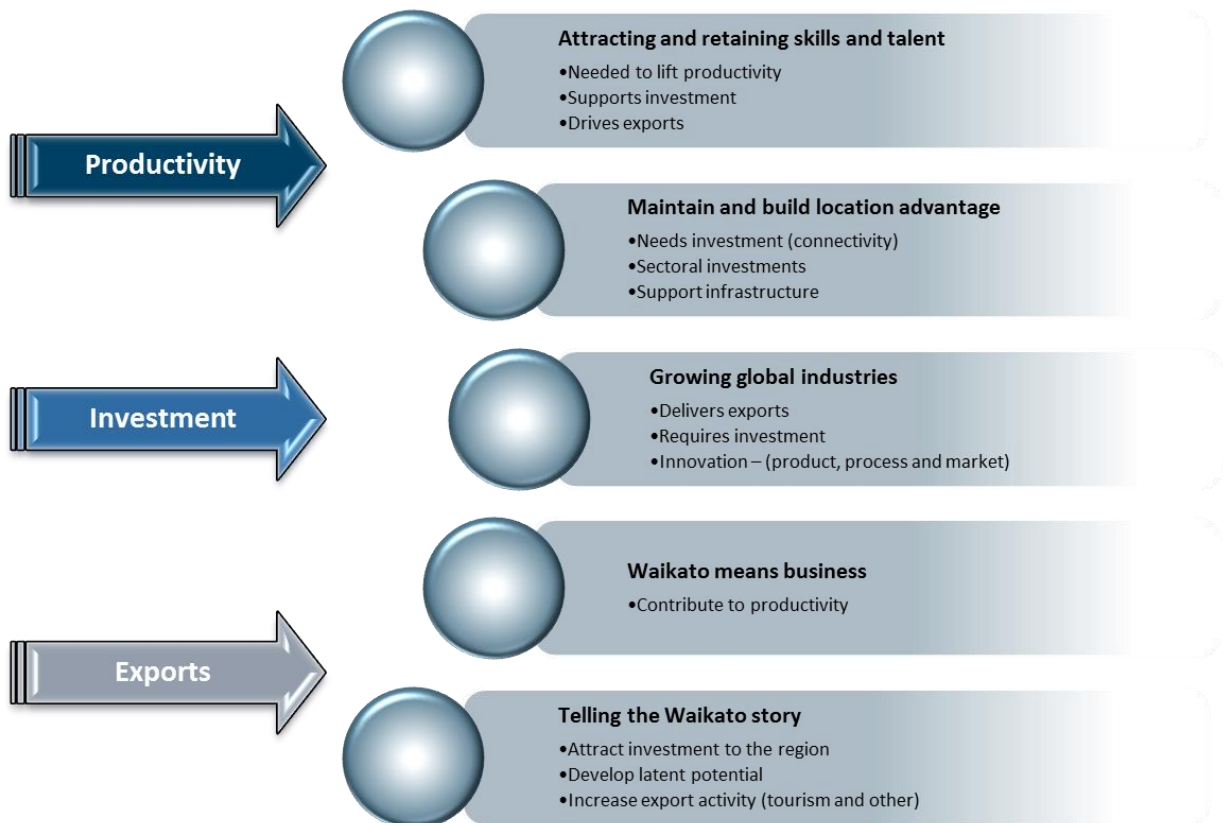
This also means that it is possible to set the growth goals in a way that reflects other priorities. A high level review of the draft outputs (EDS – discussion paper) shows good alignment between the growth goals and the potential strategic priorities and areas of focus (see Figure 2.3).

Table 2.3: Achievability

Target Growth Rate (GDP per capita)	Productivity Growth			Premium Productivity Growth		
	All Sectors	Key Sectors	Non-Agri Key Sectors	All Sectors	Key Sectors	Non-Agri Key Sectors
Target1: Growth of 5.8%	Red	Red	Red	Red	Red	Red
Target 2 : Growth of 2.9%	Yellow	Yellow	Yellow	Green	Green	Green
Target 3: Growth of 2.7%	Green	Green	Green	Green	Green	Green

Legend: **Red** – Unachievable; **Yellow** – Marginal; **Green** Achievable - Stretched

Figure 2.3: Alignment with EDS Strategic Priorities



3 Suggested Goals

Based on the analysis, the following growth goal is suggested:

- To lift VA per capita growth to 2.8% per year⁸ so that the Waikato region will be in the top third⁹ of regions in NZ in terms of economic performance. To do this it will be necessary to:
 - Lift productivity by 1% per year.
 - Grow international exports by 1.5% per year. Put differently, to lift exports by 35% by 2031.
 - Lift VA in the key sectors by 80% (2012 – 2031). This will require compound annual growth rate of around 3% in the key sectors.

A by-product of lifting economic output will be an increase in labour demand. While not a goal in itself, it is estimated that increasing economic output (in-line with the above drivers) will require around 80,000 additional employees by 2031. This equates to around 4,200 new jobs per year. As mentioned earlier, labour constraints and associated issues are important considerations that will need specific attention. Further, the growth in the labour force will also change the labour force composition. A basic assessment suggests that as the economy grows (with a focus on the key sectors) demand for higher quality labour will increase. Combining the National Industry Occupation Structure (6-Digit Level ANZSCO data, almost 1000 occupations – 2006 Census year) with the Waikato Qualification Structure¹⁰ provides an ability to estimate the skills requirement going forward and express the requirement as a percentage of the population. Based on these information source the proportion of the labour force with qualifications above degree level expressed as a percentage of the population¹¹ is projected to increase from 7.5% to 9.1% between 2011 and 2031. This highlights the need for improving the quality of Waikato’s labour force.

The GG requested an estimate of the share of the population with degree and higher qualification be estimated for 2031. This estimation can be done using a labour force approach (building on the preceding) or a demographic approach. The labour force approach uses the change in share of the labour force with a degree or higher (as estimated using the growth goals) to grow the Census 2006 proportion (12.3%). This yields a 2031 estimate of 16.8% of the population with degrees of higher. However this approach does not capture the full effects of an ageing population because retirees with degrees and higher are not included.

⁸ This is a lift of 60% between 2012 and 2031.

⁹ This is the same as the Top 3 regions excluding Auckland and Wellington.

¹⁰ This Census data shows the distribution of qualifications (14 qualification categories) across different occupations (1,000 occupations).

¹¹ It is important to note that this is not the percentage of residents (as presented in the background report) but. The percentage of the labour force with degree or higher qualifications expressed as a percentage of the total population. This means that the percentage does not capture students, retired people or people who are not part of the labour force. This approach also assumes that the labour force structure – qualification mix per occupation and occupation mix per sector - remains constant.

The second approach considers the demographic shifts between Census 2001 and Census 2006. This approach starts with the highest qualification by age group for the Waikato Region. Next it is assumed that the share of each age cohort with no degree continues to change at the rate observed between the 2001 and 2006 censuses. This is a conservative approach, as it assumes that the rate of growth for the population with degrees or higher will slow as it expands, representing a greater share of the total population (i.e. as this portion gets bigger it's growth slows). Expressed as a share of the total population, the share with degrees was 12.3%¹² in 2006. **Projecting the growth per age cohort¹³ forward to 2031 and expressing the results as a share of the total population yields 20.1%¹⁴** (i.e. the figure for the subsidiary goal).

Caveat: *The highest qualification classifications changed between the 2001 and 2006 censuses, resulting in possible inconsistencies when comparing the two Census datasets. We have followed the guidelines for comparing the data as set out in the Statistics New Zealand publication, 'QuickStats About Education and Training'. However, we recommend treating the outcomes with appropriate caution. We suggest updating the growth goals once the Census 2013 data is released.*

4 Concluding Remarks

As mentioned in the caveats and limitations section, the results presented here are not forecasts but reflect possible future situations under different growth assumptions. It will be necessary to undertake additional work to confirm and validate the findings focusing on detailed sector (6D ANSZIC classification of the key sectors) and local supply chain effects, relationships and connections. Further, by considering the dynamic issues such as the economy-environment interface, environmental resource capacity and the potential influence of changes in central government policies (e.g. National Environmental Standards – Freshwater¹⁵) a different growth goal might emerge. Crucially, the modelling used to assess the growth goals does not capture environmental constraints. It is not possible to model the economy-environment interface using (currently) available¹⁶ models. It is important to note that the economy-environment interactions are dynamics with feedbacks between the systems. These feedbacks are characterised by non-linearities (and potential tipping points), lags and complex cause-effect relationships which may produce emergent behaviour not captured in the current model.

The modelling suggests that labour availability will be a key issue irrespective of whether above-trend growth is achieved or not. Therefore delivering the EDS activities (strategic

¹² Share of the population over 15 years with degrees or higher.

¹³ Using SNZ medium projections.

¹⁴ The share of the population over 15 year with degrees or higher is 24.9%

¹⁵ This is particularly important for land intensive agriculture activities and the associated downstream activities e.g. dairy farming and dairy product manufacturing.

¹⁶ In the New Zealand context, the study of these dynamics is currently the arena of research projects. One particularly promising approach is the Multi-Scale Modelling of Ecosystem Services (MIMES) approach. This approach is currently being explored within the Manawatu-Wanganui Regional Council, by a collaborative research group based out of Massey University, but its findings and approach may be of interest.

priorities) to support and lift productivity will be a critical issue determining Waikato's future success and contribution to the NZ economy and the government's Business Growth Agenda (BGA). A central plank of the BGA is to lift exports and under the Waikato growth goal the region will contribute a larger share of the country's exports¹⁷.

The analysis suggests that attaining VA growth around the 2.5% mark is achievable but will require increases in exports, investment and productivity. This will be a stretch but it is achievable. The implementation of large projects, such as the Ruakura inland port, will also assist in moving the economy onto a higher growth path and will be a 'fundamental addition to the economic activities in the region'.¹⁸

¹⁷ Assuming that the export targets are achieved and that the other regions keep growing at historic rates, then Waikato's contribution to NZ exports is projected to increase from around 8% to over 13%. This projection is based on a high level and initial assessment and should be regarded as indicative only.

¹⁸ Review of Castalia Reports on Ruakura and Implications. April 2012. BERL. Ref#5198.

5 Appendices

Appendix 1: Export Growth Rates

Target	Sectoral Mix	Productivity	2011-2016	2016-2021	2021-2026	2026-2031	Average over the periods
Target 1	All Sectors	Growth	4.2%	3.2%	4.5%	2.9%	3.7%
		Premium	4.2%	3.2%	4.5%	2.9%	3.7%
	Key Sectors	Growth	2.7%	2.0%	2.9%	1.9%	2.4%
		Premium	2.7%	2.0%	2.9%	1.9%	2.4%
	Non-Agri Key Sectors	Growth	2.3%	1.6%	2.7%	1.7%	2.1%
		Premium	2.3%	1.6%	2.7%	1.7%	2.1%
Target 2	All Sectors	Growth	2.1%	1.6%	2.2%	1.5%	1.8%
		Premium	2.1%	1.6%	2.2%	1.5%	1.8%
	Key Sectors	Growth	2.2%	1.7%	2.4%	1.6%	2.0%
		Premium	1.6%	1.2%	1.7%	1.1%	1.4%
	Non-Agri Key Sectors	Growth	1.2%	0.9%	1.3%	0.9%	1.1%
		Premium	1.2%	0.9%	1.3%	0.9%	1.1%
Target 3	All Sectors	Growth	1.9%	1.4%	2.0%	1.3%	1.7%
		Premium	1.9%	1.4%	2.0%	1.3%	1.7%
	Key Sectors	Growth	1.5%	1.1%	1.6%	1.0%	1.3%
		Premium	1.5%	1.1%	1.6%	1.0%	1.3%
	Non-Agri Key Sectors	Growth	1.4%	1.0%	1.5%	1.0%	1.2%
		Premium	1.4%	1.0%	1.5%	1.0%	1.2%

This table shows the effective international export growth rate after adjusting the growth rates of each of the 48 economic sectors.

Appendix 2: Sectoral Performance - Examples

Core Settings:

- Lift performance of key sectors and let non-key sectors grow drivers change at underlying rates.
- Assume a lift in underlying productivity growth.
- Aim to growth in a manner that will reach Target 3.

	Value Added					Modified Employee Counts				
	2011	2016	2021	2026	2031	2011	2016	2021	2026	2031
Horticulture & fruit growing	80	90	100	100	110	2,540	2,630	2,610	2,590	2,570
Livestock & cropping farming	190	220	240	260	290	3,640	4,050	4,470	4,920	5,420
Dairy cattle farming	930	1,090	1,240	1,410	1,610	11,240	12,910	14,100	15,400	16,830
Other farming	60	70	70	80	90	1,920	2,080	2,210	2,370	2,540
Svcs to agriculture, hunting & forestry & logging	110	140	170	210	260	3,120	3,690	4,240	4,930	5,590
Fishing	160	170	190	200	220	1,500	1,570	1,590	1,590	1,560
Mining & quarrying	20	20	30	30	30	250	280	320	350	380
Oil & gas exploration & extra	120	130	150	170	190	1,340	1,510	1,690	1,920	2,160
Meat & meat prod manuf	-	-	-	-	-	-	-	-	-	-
Dairy prod manuf	350	360	360	350	340	3,350	3,420	3,370	3,220	3,050
Other food manuf	290	390	530	730	960	3,070	3,950	4,920	6,370	7,770
Beverage, malt & tobacco ma	90	90	100	110	110	1,150	1,230	1,310	1,390	1,470
Textile & apparel manuf	20	20	30	30	30	110	120	130	140	150
Wood prod manuf	20	20	20	20	20	430	410	410	420	420
Paper & paper prod manuf	190	190	170	140	90	2,250	2,170	1,860	1,450	930
Printing, publishing & record	90	90	90	80	70	560	560	520	470	400
Petroleum & industrial chem	90	110	120	130	150	1,330	1,480	1,640	1,830	2,030
Rubber, plastic & other chem	60	70	80	100	120	300	350	410	490	570
Non-metallic mineral prod m	110	130	160	190	230	1,230	1,470	1,740	2,110	2,500
Basic metal manuf	80	100	120	150	180	550	700	860	1,040	1,250
Sheet & fabricated metal pro	70	80	100	120	150	550	660	790	940	1,090
Trans equipment manuf	200	250	300	360	430	2,510	2,820	2,990	3,140	3,250
Machinery & equipment mar	80	90	100	110	130	1,130	1,210	1,230	1,270	1,310
Furniture & other manuf	200	240	280	330	390	3,060	3,420	3,580	3,730	3,850
Electricity generation & supp	40	40	50	50	60	620	650	660	670	670
Gas supply	460	520	580	660	740	1,280	1,430	1,570	1,740	1,910
Water supply	20	20	30	30	40	20	20	30	30	30
Construction	50	50	60	70	80	100	110	120	140	150
Wholesale trade	810	1,040	1,300	1,590	1,920	14,950	18,970	23,140	27,680	32,500
Retail trade	660	750	860	990	1,130	8,370	9,220	9,780	10,440	11,060
Accommodation, restaurants	910	1,020	1,130	1,270	1,410	22,480	24,300	25,140	26,080	26,850
Road trans	270	290	330	390	460	10,450	11,390	12,420	14,200	16,540
Water & rail trans	170	200	250	310	370	3,770	4,420	5,180	6,160	7,230
Air trans, svcs to trans & stora	20	30	30	30	40	190	210	220	240	260
Communication svcs	100	100	110	130	140	1,030	1,120	1,200	1,300	1,400
Finance	340	380	430	480	530	1,840	2,000	2,080	2,160	2,240
Insurance	390	450	510	590	670	1,670	1,830	1,940	2,080	2,200
Svcs to finance & investment	50	60	70	70	80	400	440	470	500	530
Real estate	80	100	110	120	130	730	790	820	850	890
Owner-occupied dwellings	660	740	820	900	980	3,290	3,650	3,980	4,330	4,680
Business svcs	930	1,010	1,090	1,150	1,210	-	-	-	-	-
Central government	1,140	1,350	1,600	1,910	2,270	18,810	22,010	25,380	29,590	34,300
Local government	340	370	400	430	450	5,830	6,150	6,140	6,090	5,980
Education	210	230	260	280	310	2,250	2,490	2,700	2,920	3,130
Health & community svcs	620	660	690	710	740	15,730	16,470	16,810	17,040	17,170
Cultural & recreational svcs	930	1,050	1,160	1,270	1,370	19,640	21,900	23,580	25,130	26,430
Personal & other community	280	310	330	360	380	5,090	5,530	5,890	6,240	6,570
TOTAL	220	250	280	320	360	4,990	5,440	5,680	5,970	6,210
TOTAL	13,290	15,170	17,180	19,520	22,050	190,630	213,230	231,950	253,640	276,030

Core Settings:

- Lift performance of all sectors across the economy by assuming broad improvements (in export performance, GFKF and productivity).
- Assume that a productivity growth premium is achieved.
- Aim to growth in a manner that will reach Target 2.

	Value Added					Modified Employee Counts				
	2011	2016	2021	2026	2031	2011	2016	2021	2026	2031
Horticulture & fruit growing	80	90	100	100	110	2,540	2,530	2,310	2,110	1,940
Livestock & cropping farming	190	220	240	260	290	3,640	4,050	4,470	4,920	5,420
Dairy cattle farming	930	1,090	1,240	1,410	1,610	11,240	12,900	14,080	15,360	16,760
Other farming	60	70	70	80	90	1,920	2,060	2,140	2,240	2,360
Svcs to agriculture, hunting & fishing	110	140	190	240	300	3,120	3,690	4,070	4,530	4,890
Forestry & logging	160	170	190	200	220	1,500	1,570	1,580	1,580	1,550
Fishing	20	30	40	50	70	250	340	440	560	690
Mining & quarrying	120	130	150	170	190	1,340	1,510	1,700	1,940	2,190
Oil & gas exploration & extraction	-	-	-	-	-	-	-	-	-	-
Meat & meat prod manuf	350	360	360	350	340	3,350	3,410	3,340	3,160	2,960
Dairy prod manuf	290	400	530	750	990	3,070	3,970	4,970	6,490	7,970
Other food manuf	90	90	100	110	120	1,150	1,250	1,320	1,410	1,500
Beverage, malt & tobacco manuf	20	30	30	40	40	110	120	140	160	190
Textile & apparel manuf	20	20	20	20	20	430	370	360	370	380
Wood prod manuf	190	190	170	140	90	2,250	2,160	1,850	1,400	840
Paper & paper prod manuf	90	90	90	80	70	560	560	520	470	390
Printing, publishing & recording	90	110	120	140	160	1,330	1,490	1,660	1,860	2,070
Petroleum & industrial chemicals	60	70	90	100	120	300	350	420	490	580
Rubber, plastic & other chemical products	110	130	160	200	250	1,230	1,500	1,790	2,170	2,580
Non-metallic mineral products	80	100	120	150	170	550	690	830	980	1,130
Basic metal manuf	70	80	100	130	150	550	670	810	960	1,130
Sheet & fabricated metal products	200	250	300	370	440	2,510	2,840	3,020	3,180	3,300
Trans equipment manuf	80	90	100	110	130	1,130	1,210	1,240	1,290	1,330
Machinery & equipment manuf	200	240	290	340	390	3,060	3,430	3,600	3,760	3,890
Furniture & other manuf	40	40	50	60	60	620	640	620	600	580
Electricity generation & supply	460	520	590	670	760	1,280	1,440	1,590	1,760	1,950
Gas supply	20	20	30	40	40	20	20	30	30	40
Water supply	50	50	60	70	80	100	110	120	140	150
Construction	810	1,050	1,320	1,630	1,970	14,950	19,110	23,460	28,220	33,320
Wholesale trade	660	770	900	1,060	1,250	8,370	9,060	9,100	9,200	9,230
Retail trade	910	1,030	1,170	1,330	1,500	22,480	23,680	22,970	22,360	21,610
Accommodation, restaurants & cafes	270	290	330	390	470	10,450	11,400	12,440	14,290	16,740
Road trans	170	210	250	320	390	3,770	4,460	5,290	6,360	7,550
Water & rail trans	20	30	30	30	40	190	200	210	220	230
Air trans, svcs to trans & storage	100	110	120	130	150	1,030	1,120	1,200	1,290	1,380
Communication svcs	340	380	440	500	560	1,840	1,940	1,880	1,830	1,770
Finance	390	450	520	610	700	1,670	1,780	1,760	1,750	1,730
Insurance	50	60	70	80	80	400	430	430	440	440
Svcs to finance & investment	80	100	110	120	140	730	760	740	720	700
Real estate	660	760	850	960	1,080	3,290	3,710	4,080	4,490	4,910
Owner-occupied dwellings	930	1,010	1,090	1,150	1,210	-	-	-	-	-
Business svcs	1,140	1,360	1,630	1,970	2,370	18,810	22,210	25,870	30,470	35,670
Central government	340	370	400	430	460	5,830	5,910	5,460	5,010	4,550
Local government	210	240	260	290	330	2,250	2,500	2,710	2,930	3,150
Education	620	660	690	720	740	15,730	16,470	16,810	17,050	17,180
Health & community svcs	930	1,050	1,160	1,270	1,370	19,640	21,900	23,570	25,100	26,390
Cultural & recreational svcs	280	310	340	360	390	5,090	5,520	5,840	6,140	6,420
Personal & other community svcs	220	250	290	330	380	4,990	5,280	5,160	5,060	4,930
	13,290	15,290	17,470	20,050	22,860	190,630	212,330	228,000	246,850	266,630

Core Settings:

- Lift performance of the non-agricultural key sectors by increasing these sectors' performance above the baseline using exports, GFKF and productivity as core drivers.
- Assume that a productivity growth premium is achieved.
- Aim to growth in a manner that will reach Target 2.

	Value Added					Modified Employee Counts				
	2011	2016	2021	2026	2031	2011	2016	2021	2026	2031
Horticulture & fruit growing	80	90	100	100	110	2,540	2,630	2,610	2,590	2,570
Livestock & cropping farming	190	220	240	260	290	3,640	4,050	4,470	4,920	5,420
Dairy cattle farming	930	1,090	1,240	1,410	1,610	11,240	13,050	14,550	16,230	18,110
Other farming	60	70	70	80	90	1,920	2,080	2,210	2,370	2,540
Svcs to agriculture, hunting & forestry & logging	110	130	150	160	180	3,120	3,420	3,590	3,760	3,890
Fishing	20	20	30	30	30	250	280	320	350	380
Mining & quarrying	120	130	150	170	190	1,340	1,500	1,690	1,900	2,150
Oil & gas exploration & extra	-	-	-	-	-	10	10	10	10	20
Meat & meat prod manuf	350	370	380	400	420	3,350	3,510	3,620	3,740	3,870
Dairy prod manuf	290	350	410	490	560	3,070	3,600	4,070	4,630	5,120
Other food manuf	90	90	100	100	110	1,150	1,230	1,300	1,370	1,440
Beverage, malt & tobacco ma	20	20	30	30	30	110	120	130	140	150
Textile & apparel manuf	20	20	20	20	20	430	420	420	440	460
Wood prod manuf	190	200	220	240	260	2,250	2,370	2,480	2,630	2,800
Paper & paper prod manuf	90	100	100	100	110	560	580	590	610	630
Printing, publishing & record	90	100	120	130	150	1,330	1,480	1,630	1,800	1,990
Petroleum & industrial chem	60	70	80	90	100	300	340	380	420	470
Rubber, plastic & other chem	110	130	150	170	190	1,230	1,430	1,630	1,870	2,120
Non-metallic mineral prod m	80	100	130	170	220	550	730	940	1,190	1,480
Basic metal manuf	70	90	110	140	170	550	680	840	1,020	1,230
Sheet & fabricated metal pro	200	250	320	390	480	2,510	2,860	3,020	3,170	3,270
Trans equipment manuf	80	90	100	110	130	1,130	1,200	1,210	1,230	1,260
Machinery & equipment mar	200	250	300	370	440	3,060	3,480	3,670	3,850	4,020
Furniture & other manuf	40	40	50	50	60	620	660	690	710	740
Electricity generation & supp	460	510	570	630	700	1,280	1,410	1,520	1,640	1,760
Gas supply	20	20	30	30	40	20	20	30	30	30
Water supply	50	50	60	60	70	100	110	110	120	130
Construction	810	1,100	1,450	1,870	2,360	14,950	19,970	25,560	31,990	39,210
Wholesale trade	660	750	850	960	1,080	8,370	9,160	9,630	10,130	10,610
Retail trade	910	1,010	1,110	1,220	1,320	22,480	24,090	24,600	25,010	25,270
Accommodation, restaurants	270	300	340	420	530	10,450	11,490	12,730	15,160	18,700
Road trans	170	200	220	250	290	3,770	4,220	4,600	5,000	5,390
Water & rail trans	20	20	30	30	30	190	200	210	220	230
Air trans, svcs to trans & stora	100	100	110	120	130	1,030	1,110	1,170	1,240	1,310
Communication svcs	340	380	420	460	510	1,840	1,980	2,040	2,090	2,140
Finance	390	440	490	540	600	1,670	1,800	1,850	1,910	1,950
Insurance	50	60	60	70	80	400	430	450	470	480
Svcs to finance & investment	80	90	100	110	120	730	780	790	810	820
Real estate	660	740	810	880	960	3,290	3,640	3,950	4,260	4,580
Owner-occupied dwellings	930	1,010	1,090	1,160	1,220	-	-	-	-	-
Business svcs	1,140	1,350	1,590	1,880	2,250	18,810	21,890	24,990	28,760	33,250
Central government	340	370	400	430	450	5,830	6,140	6,130	6,060	5,950
Local government	210	230	250	280	300	2,250	2,480	2,680	2,880	3,070
Education	620	660	690	710	740	15,730	16,410	16,650	16,800	16,850
Health & community svcs	930	1,050	1,160	1,260	1,360	19,640	21,810	23,320	24,650	25,740
Cultural & recreational svcs	280	310	330	360	380	5,090	5,530	5,890	6,230	6,550
Personal & other community	220	250	280	300	330	4,990	5,390	5,540	5,690	5,790
	13,290	15,170	17,170	19,460	22,000	190,640	213,360	232,230	253,850	277,710