



Smart Growth

Employment Projections

Methodology and Key Findings

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1 Introduction

Tauranga City and the Western Bay of Plenty are experiencing strong growth and after the setbacks of the PSA and the Global Financial Crisis, the sub-region is facing growth pressures. To manage this growth, the Councils are updating the models they are using to inform investment spending decisions. Modelling traffic movements in, and around, the sub-region is an example of the evidence base used. An important input into traffic modelling is household and employment projections. The traffic model is currently being updated with a view to use it for projects such as the Tauranga Programme Business Case and related work.

The Market Economics (M.E) team was commissioned to prepare employment projections showing the employment outlook by location (traffic zone¹) and sector (five sectors as defined in Appendix 1). Two scenarios were modelled – a greenfield scenario and an intensification scenario.

- a. Greenfield scenario: This scenario is based on current trends with growth occurring in greenfield areas, i.e. growth is primarily in existing growth areas and then further growth areas in the eastern and western corridors.
- b. Intensification scenario: The intensification scenario reflects a higher level of intensification, i.e. a more aspirational compact city scenario. In this scenario the location of greenfield development is consistent with the first scenario but there would be less need for growth to occur in the western corridor.

The purpose of this report is twofold:

- Firstly, to summarise the methodology used to estimate the employment projections (including the spatial allocation process), and
- Secondly, to highlight the key findings.


This report does not provide a detailed account of the actual results and only a high level summary of the results is presented. Spreadsheets with the results have been provided to Council staff separately. Nevertheless,

1.1 Important considerations

A number of key points were identified during the process and it is important to be aware of them and their implications. They include:

- **Uncertainty**: This assessment covers a long timeframe with considerable uncertainty. We used assumptions around the rates of growth, the spatial patterns of employment (i.e. urban structures and form) and population growth rates. While historic patterns, ratios and trends were used and informed our projections, they do not necessarily explain future development pathways. As with all modelling, there is a real probability that the modelled results will diverge from the actual, on the ground outcomes.
- **Centres-based approach**: In allocating employment to existing business locations, we assumed that the Councils would enable additional development to accommodate the growth. An important underlying assumption is that the growth would be focused in the existing centres and

¹ The main purpose was to prepare the employment projections at a traffic zone level but a set of meshblock level estimates were also prepared.



business locations. This will need to take place in a way that supports the effective and efficient functioning of the market. As the population surrounding centres and business locations grow, there is likely to be productivity improvements at a centre level. These productivity gains are likely to manifest in ratios such as sales per floor area (e.g. \$/m²). Given the complexity and difficulty in estimating such productivity gains, our analysis does not include such adjustments.

- **Recent growth:** During the initial stages of our project, we encountered a number of data issues. The most important being accessing the latest Business Demography Survey (BD) data. This information was received and the draft model was updated to reflect the latest information. The BD shows employment, by sector and by meshblock for the year ending February². This suggests that the starting point in our model is already out of date by one year. In light of the strong growth in employment over the past 2 years or so³, the difference in employment could be material (especially in some of the sub-region's growth areas such Tauriko and the smaller urban areas in WBoP). Using a lower starting point is likely to understate the actual (current) employment, in turn, this also means that the business locations could be at capacity, sooner than expected⁴. We used the NIDEA projections to inform our growth outlook for 2016 to 2017 and increased employment accordingly.
- **Population figures:** The projections rely heavily on NIDEA's population projections as it informs the economic model and it is also used as a cross check. Population is a source of labour (i.e. workers) and people also consume goods and services (demand). The number of people that can participate (work) in the economy is a natural limit on total employment. Statistics New Zealand recently released a new set of population projections. Over the short term, these projections are higher than NIDEA's. This implies that the population growth (and therefore the employment activities that are associated with population) could be higher⁵ than anticipated (and used in the employment projections). Higher growth will have two important effects:
 - Firstly, a larger population will require more goods and services (i.e. stimulating demand),
 - Secondly, provide access to a larger labour force⁶.

The last two bullet points serve to highlight the uncertainties associated with this type of projection. These two uncertainties suggest that over the short term, strong growth is expected (stronger than currently modelled) and this will bring the development pressures forward. Therefore, the projections are likely to be low in the short term.

1.2 Limitations and information

As with all models, there are a number of limitations and caveats that should be kept in mind when using the results and these are outlined below:

- The employment projections cover a long timeframe and there are a number of factors that will change them going forward. They are not 'predictions' but show one potential outcome. It will be necessary to continually refine and update the information (i.e. the base figures and the growth rates as new information becomes available),


² Released around October/November of the same year.

³ Both years, employment grew in excess of 5% (per year).

⁴ Indicatively, this could be by around between 1 and 5 years sooner (depending on the location).

⁵ The difference could be material.


⁶ Subject to the age profile associated with the population growth.

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- The project was set up with the traffic modelling work as key objective. While the outputs could be used for other purposes, it would be important to adjust and change the employment projections to ensure that they are ‘fit for purpose’ (for the other use). This will be very important when reviewing a small area (e.g. a small business location).
 - The modelling builds on, uses and relies on existing research and we did not audit or peer review the existing material.
 - The points mentioned in section 1.2 introduce their own limitations (as mentioned) affecting the estimates. For example, the centres-based approach sets the scene for allocating growth to existing locations and we do not identify ‘new’ business locations or make assumptions around the potential future of the locations.
 - The employment projections (and allocation) are based on information about the timing and scale (ha area) of greenfield locations. Changing the time or scale will affect the spatial patterns of employment. For example, towards the end of the assessment period, the Te Maunga is expected to become available. If this area is not developed then the growth that it would have captured will need to be accommodated elsewhere. This will change the spatial patterns of the city⁷.
 - The employment projections are not land area projections (although it would be possible to use them as inputs into such projections by making appropriate assumptions).

We consulted numerous sources during the project. Some for background information and other to inform specific parts. Where relevant, the sources are highlighted in footnotes. The information and sources used were:

- WBoP and TCC planning zones (GIS files),
- Wairakei/Te Tumu Framework Plan (final draft),
- Westpac Bank (Industry Insights),
- Ministry of Business, Innovation and Employment,
- Statistics New Zealand (various databases),
- NIDEA population projections,
- Wairakei, Papamoa Employment Land Review – Property Economics (2014),
- Upper North Island Freight Story – Upper North Island Strategic Alliance (2013),
- Industrial Land Research – McDermott Consultants (2012),
- SmartGrowth Commercial Update – Property Economics (2012),
- SmartGrowth Strategy Update Discussion Document: Business Land (2012),
- Western Bay of Plenty Sub Regional – Retail and Commercial Strategy: Implementation Paper (2008),
- Tauranga City & Western Bay of Plenty Retail and Commercial Strategy: Peer Review – Phil McDermott Consultants (2008),
- Tauranga City & Western Bay of Plenty Retail and Commercial Strategy – Property Economics (2008),
- Business Land Requirements Review Western Bay of Plenty (Report to SmartGrowth) - Phil McDermott Consultants (2006),
- SmartGrowth – Development Trends. Technical Report 2016,
- Industrial Land Study. BECA. (2008),

⁷ We undertook a simple sensitivity analysis and excluding Te Maunga will have a noticeable effect on the business locations around Te Tumu and Tauriko.

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- SmartGrowth Employment Predictions (2006-2031). Boffa Miskel. (2007),
 - Western Bay of Plenty SmartGrowth Study. Part 2: Economic Drivers and Determinants. (2002).

A number of stakeholder interviews were conducted to get a sense from industry about their growth outlooks, prospects and the issues affecting their industries. We had interviews with:

- Toi Ohomai Institute of Technology (Bay of Plenty Polytechnic),
- Port of Tauranga Limited,
- The Bay of Plenty District Health Board,
- New Zealand Kiwifruit Growers Incorporated (NZKGI),
- Priority One,
- Export NZ,
- Chamber of Commerce, and
- Element IMF.

Attempts to include other stakeholders⁸ (within the project timeframes) were unsuccessful. Including a wider range of stakeholders generally adds to the richness of the analysis but we feel that interviews (we conducted) listed above provided sufficient details into the growth outlook. Note: in section 3.3.2, we comment on the Maori economy and highlight that as part of the economy.

1.3 Structure

The report is structured as follows:

- Section 2 describes the methodology and the key assumptions
- Section 3 presents the key findings, focusing on the spatial distribution of employment and the intensification scenario. The section concludes by highlighting some of the key sensitivities.
- Section 4 provides some concluding remarks.

⁸ We will be working to include some key stakeholders in the engagement process before finalising the process.



2 Methodology and Assumptions

The employment projections and the spatial allocation process were delivered using a number of steps. At the high level, we used the following steps:

- Reviewed the existing employment projections and existing commercial studies,
- Reviewed the existing information about the land supply capacity in the area (Western Bay of Plenty - WBoP and Tauranga),
- Developed the employment projections for the overall area. The employment projections were informed by sector interviews during which industry stakeholders were questioned about the growth outlook. Where appropriate, the growth outlook was adjusted. In most instances, the adjustments were upward over the short term.
- Allocated the employment projections spatially, and
- Performed cross checks to verify that all employment is allocated and that the allocations align (broadly) with known development trends.

The above steps relate to the overall study. Below, the logic used in developing the actual model is summarised.

The modelling was undertaken by using a combination of 'R' and Excel. Conceptually, the main steps are described below. Note that the steps were not undertaken in a linear, sequential manner. Figure 2.1 shows the relationships and flows between the steps and each step's key points are discussed below.

2.1 Macro level employment projections

The first step entailed estimating the high level employment projections. This was done using M.E's Economic Futures Model (EFM). The model uses three drivers to project growth: population, gross fixed capital formation and exports. These rates are first set, using the historic trends (20 years or so) for each sector in the model. The model covers 48 sectors. The model is then matched to the most recent Business Demography Survey (BDS) information from Statistics NZ. The most recent BDS information is for 2016 with the 2017 information expected at the end of October (2017).

With reference to population, we relied on the 2014 projections produced by the National Institute of Demographic and Economic Analysis for SmartGrowth (the NIDEA projections). This was a requirement mentioned in the RfP. It should be noted that the NIDEA projections are marginally lower in the short and medium terms than the recently released Statistics New Zealand (SNZ) population projections (in the long term, the NIDEA figures overtake the SNZ figures). Importantly, the employment information is for 2016 (going back to 2000) so the recent employment growth is taken into account. This suggests that the recent population growth is reflected in the employment numbers.

The interplay between employment and population is important because the size of the population (specifically the working age population) reflects the economic resource that is available. The 'Participation Rate' is a ratio that expresses the labour force as a portion of the working age population. Based on the NIDEA projections and the employment projections, the participation rate is expected to increase from around 70% (2016) to 78% (by 2063)⁹. The current level is already high (by historic comparison) and the

⁹ This rate is based on employee counts (excluding Working Proprietors) and is relative to the working aged population (15-65 years).

increase suggests that the labour force will need to undergo a number of structural shifts to provide the labour (employment) needed to deliver the potential level of economic activity¹⁰.

Figure 2.1: Key steps



¹⁰ This includes productivity gains, making use of the ageing population and attracting workers from outside the area.



Two key shifts are expected:

- Firstly, together with the aging population we expect an increase in the number of people working past pension age to increase – an increase in the number of employees aged 65-69 years (and 70-74 years) to increase. The effect of this is to lift the effective size of the labour force. For example, if a quarter (1 in 4) of the 65-69 year cohort remains active in the labour force (by 2063), then this add 4,190 workers to the labour pool – 3% of the labour force.
- Secondly, the number of workers commuting into the area for work is expected to increase. For example, the recent Census (2013) suggests that around 1.7% of the area's labour force travels into it from areas such as Waihi, Paeroa, Rotorua, Hamilton and Whakatane.

Combined, these two shifts suggest that while the participation rate is expected to increase to high levels, it should be used with caution. The high ratio simply suggests that a larger share of the potentially active labour force would need to work. Nevertheless, business should be able to get workers to undertake work. From an economic development perspective (not the focus of this work), the key challenge of finding *suitable* (quality and quantity) labour is likely to intensify, and competition for talent is expected to remain a core business issue.

2.2 Business locations – historic trends and features

The study area was reviewed and a number of business locations were identified using the current business zones (including commercial and industrial land uses). Based on the zones, fifty two business locations were defined (based on zoning and general location and type of employment) – these locations were not meant to reflect 'centres' of 'growth management areas'. Instead, they were simply used to make the dataset more manageable.

The historic employment trends for the each business location (and by Meshblock) were reviewed and we identified the following key features:

- The historic maximum employment in each location,
- The historic growth rates (compound and percentage shift), and
- The share of the City's (or District's) employment that is based at each business location (by sector and total).

Spatial information (specifically area, m²) about each business location was extracted using GIS, and related to employment. This provided a basic understanding of employment densities across the different business locations, and compared them with available information around densities¹¹ (This information was used during later steps to triangulate our results). Next, the distribution of employment across business zones was reviewed, distinguishing between 'within' and 'out of zone' locations. The review suggests that around a third of total employment is located in 'out of zone' locations – this includes employment in sectors such as:

- A (Agriculture),
- B (Mining),
- E (Construction),
- P (Education and training),

¹¹ Specifically the 2006 study by Phil McDermott Consultants titled: Business Land Requirements Review

- M (Professional, scientific and technical services),
- N (Administration and support services), and
- Q (Health care and social assistance).

We used the shares of employment that is located ‘out of zone’ to estimate the share of total employment to allocate to ‘within’ zones, as part of the initial allocation process (this condition is relaxed during later stages).

2.3 Schools and retirement villages

Council staff provided a list of expected developments and their locations (and timing) for inclusion. Using the available SNZ data (business demography), the average size and trend (employment) of Tauranga’s schools and retirement villages were estimated. Employment was then allocated to the relevant meshblocks at the relevant points in time (i.e. when they are expected to open).

In terms of the future outlook of employment in schools, the size of the population in the immediate surrounds of the schools was used as the main driver to inform the employment estimates. The meshblock level population projections (estimated by Council based on the NIDEA projections) were used to inform the growth rate¹².

With reference to the retirement villages, the base assumption for these businesses is that they will seek to minimise costs while maintaining service levels. This suggests that their employment levels will remain relatively stable i.e. they have sufficient employees to meet demand. Similarly, they have a set level capacity (i.e. rooms, units or beds). Therefore, no ‘extra growth’ is allocated to the retirement villages based on the features of the neighbourhood. However, a portion of overall growth in Health Care and Social Assistance (Sector Q) is allocated to retirement villages. This is to account for growth opportunities arising from the aging population. Headline growth is allocated based in the relative share of sector Q (%-share of employment relative to total employment in sector Q).


2.4 Business locations - growth

For the first round of the business area employment estimates, the historic growth rates were projected forward on a ‘per sector’ and ‘per location’ basis. Of course, this is unconstrained and is used as a ‘starting’ point with a number of adjustments. For the industrial locations, the following key points applied:

- Restrict the growth of some sectors (i.e. apply a capacity limit, and exclude/limit the growth of some activities in specific locations¹³)
- Adjust some sectors to reflect sector level growth in different locations (for example, ensuring that industrial employment growth is allocated to industrial areas),
- Distribute the growth across different locations to reflect different uptake rates, when business locations come on-line and the relative attractiveness of locations. With reference to

¹² We did not have a breakdown of age structure within each meshblock and therefore an implied assumption is that neighbourhoods will retain the current mix (age structure) as they grow.

¹³ Such as retail in industrial areas.



attractiveness, we used a simple approach that assumed there is an ‘establishment premium’ in existing (partially developed) locations over new (and vacant) locations. This premium diminishes as space is taken up.

With reference to the more retail-focused (commercial) business locations, the projected growth in the surrounding population is used to inform the shifts. The expected growth is then netted off the business location growth to identify any residual employment. In other words, macro level growth in retail and commercial (terms used loosely) employment is used to estimate the balance between the business location level growth and the sum of total growth (by sector, across the city and district). The total growth that is allocated to the different business locations is limited to a maximum percentage change for three of the Smart Growth sectors¹⁴. Agriculture and Education are excluded from this step because agriculture is not present in business locations and if agriculture businesses or activities were in the locations, then they tended to be small. The education services are grown using macro level growth projections and this is allocated to different business locations based on a *pro rata* basis.

After applying the high level growth, the quantum of potential change (at a business location and sector level) was reviewed. In some instances, the total growth greatly exceeded the potential capacity. Therefore, the growth was capped at a maximum percentage change (e.g. retail can grow by 30% and services by 50%). These limits provide a basis to restrict growth in the business areas. For example Council’s information suggests that in the Mount Manganui industrial area, vacant land is around 3.7% of the available space). The model is structured in a way that allows for both vacant land and redevelopment capacity, to be included.


With the capacity limits in place, growth is allowed to occur until it reaches the limit. Once capacity is reached, no further growth is allocated to that business location (and the relevant sector). Importantly, in applying the capacity constraints, the industrial locations are easier to deal with because more information about the vacant (available) land is available. However, this is not the case with the retail/commercial business locations (or centres). To overcome this limitation, we made an important assumption: *that the retail/commercial business locations would be able to accommodate the employment growth that would be needed to service the population shifts and growth*. This implies, indirectly, that we assume that Council(s) would permit development in existing commercial areas to accommodate the growth¹⁵.

2.5 ‘Out of zone’ activities and Reconciliation

In this step, the ‘within zone’ employment and the macro level employment projections are compared to identify the balance, i.e. if any employment has not been allocated. During the initial project stages, we compared the location of employment with zoned business areas (by overlaying Council’s (Tauranga and WBoP) land-use zones with Meshblock level employment - as prepared by SNZ). Around a third of employment is located in ‘out of zone’ locations. This excludes working proprietors but includes service-type business and some trades (e.g. construction). It also includes schools, retirement villages and the like

¹⁴ The Smart Growth sectors include: agriculture, industry, retail, services and education.

¹⁵ This does not suggest that retail or office type developments should be specifically enabled in industrial locations *per se* but relates more to changing development rules to enable more intensive use of the existing resource.



because these activities are not necessarily in their own, dedicated zone. The Tauranga Hospital is another example where a large number of people are employed in an 'out of zone' location.

The difference between the macro level employment projections and the projected employment in all the zoned business locations, is allocated to 'out of zone' locations based on the relative share of each sector that falls in each MB. Care was taken to avoid allocating growth to sectors to which growth has already been allocated (e.g. retirement villages and schools) as this would overstate employment growth.

After allocating the 'out of zone' employment, the total employment (by sector and business location) was summed up and compared with the macro level estimates. In some cases, the total employment was under-allocated, there was a surplus (i.e. some employment was not allocated). This was mostly due to capacity limits being encountered in the business (specifically industrial) locations. The net surplus was identified and the employment was then allocated to the remaining business (industrial) locations that have capacity. A share of the surplus growth is allocated to the different greenfield business areas (e.g. Te Maunga, Papamoa East Employment area and Omokoroa) as they come on-line. However, given the overall size, availability and level of development of the Tauriko industrial area (in the context of Tauranga city's development), most of the extra growth is allocated to this location.

With reference to Retail (sector G), the surplus employment was allocated to the largest retail centres, specifically, the CBD area, Bayfair and Tauranga Crossing.

The above adjustments and reconciliations ensures that the spatially allocated employment sums to the macro level projections while taking into account:

- The growth drivers at a local level (e.g. population),
- The local capacity (especially for industrial type activities), and
- Overall expected growth.

At this point, the results of the analysis and modelling provides an indication of the 'greenfield outlook' or scenario. This is referred to as the greenfield scenario because the growth is allocated to greenfield areas.

2.6 Intensification scenario

As part of our analysis and projections, we used an alternative set of population projections prepared by Council. This alternative set varies the spatial distribution of the population and intensifies the growth within existing areas in the form of infill development and redevelopment that increases densities. For our assessment, we used the difference between the greenfield and intensification scenarios to identify the potential shift in population, and reallocated the employment accordingly. The spatial shift in population patterns applies to the Tauranga City area only so the intensification scenario does not apply to the WBoP. Most of the intensification is expected (assumed) to occur around the CBD, Mount Manganui area as well as the established infill areas including along the coastal strip. Of course, the intensification is not limited to these areas and is also expected through the rest of the City (e.g. Greerton, Matua, Tauranga South etc.)

The intensification would affect different sectors' employment in different ways. Some sectors have a direct link to local population numbers while for other sectors, the link is not as strong. We reviewed the different economic sectors and identified three, high level, linkages:

- **No direct** or immediate influence (e.g. manufacturing activities),
- Influenced by the changes occurring within the **catchment** of the business (e.g. a retailer or a school),

- Indirectly influenced by the shift in the **meshblock** level changes. These changes are more likely to affect the location of the employment than it is to affect the overall demand for the services delivered by the businesses (e.g. where a tradesperson lives).

The following table shows the identified linkages.


Table 2.1: Intensification's spatial links to sectors

<i>Sector</i>	<i>Linkages</i>
A	Agriculture, Forestry and Fishing
B	Mining
C	Manufacturing
D	Electricity, Gas, Water and Waste Services
E	Construction
F	Wholesale Trade
G	Retail Trade
H	Accommodation and Food Services
I	Transport, Postal and Warehousing
J	Information Media and Telecommunications
K	Financial and Insurance Services
L	Rental, Hiring and Real Estate Services
M	Professional, Scientific and Technical Services
N	Administrative and Support Services
O	Public Administration and Safety
P	Education and Training
Q	Health Care and Social Assistance
R	Arts and Recreation Services
S	Other Services

The change in the spatial patterns is expected to affect the employment patterns in several ways, such as altering the demand for retail activity (and employment) at a neighbourhood and sub-regional level. Similarly, the demand for personal services will also change with different population projections. In addition to the direct demand for retail amenity and personal services, the shift in where people (and households) live, will also impact on the distribution of other sectors and employment. As mentioned earlier, some employment is located in 'out of zone' locations, for example, construction workers (Sector E) often have a residential location as the registered business address (of course they work at construction sites).

For some businesses, the change in population within their catchments will change business activity (and employment). We identified the population shifts at a meshblock level (across all meshblocks) relative to the greenfield scenario. Next we identified the meshblocks associated with each business location (and other 'out of zone' businesses/activities) and estimated the change in population in the immediate vicinity (using 3km and 5km thresholds). We used the change in population (relative to the greenfield scenario) and adjusted the employment estimates (for the relevant sectors) accordingly.

In addition to the above, where intensification takes place can also impact the demand for industrial land. In Tauranga's case, the industrial land is well earmarked and being developed. In addition, most of the



existing industrial locations are near (or at) capacity with limited vacancy. Therefore the effects on these locations are likely to be marginal.


The final step related to re-balancing the employment totals to match the macro level estimates. Given that the population totals for the greenfield and intensification scenarios are similar, the effect is that employment is reallocated between locations but it does not imply large, structural shifts in the spatial employment patterns.

2.7 Other points

A number of interesting observations were noted during our modelling and allocation processes. These can have a real impact on employment estimates at a Meshblock and Traffic Zone level. Examples include:

- The possible development of age-care facilities (in some Meshblocks, the employment for these sort of activities is in excess of 50 employees¹⁶). Our assessment does not identify any specific locations for such facilities. It would be useful to allow for such facilities in the modelling activities using detailed (separate) analysis of this sector and its growth path. One possible way to estimate the potential employment arising from these land uses would be to express the aged care workers in terms of the population (over 65) or a similar ratio. Aged-care employment has grown from 1,280 (2000) to 1,760 (2014) in 33 business units in 2000 to 40 in 2014. At the same time, the average employment per business has increased from 38.8 MEC/business to 44.1 in 2014. Health care and social assistance, the sector within which aged-care falls, is projected to grow by 65.2% suggesting that around 2,900 people could work in aged-care activities at the end of the assessment period.
- The land use zones (planning zones) do not specifically identify schools and other education facilities. In most cases schools (including day-care, etc.) are located in residential areas. For our assessment, the population trends in the surrounding areas are used to inform employment trends for schools and day-care. The economic model is used to inform the employment demand for tertiary education facilities. We are aware of the proposal to relocate some of the training facilities into the CBD but the timing, scale and effect on the existing facilities are unknown. Therefore, if (when) more detailed information becomes available, the employment figures should be updated.
- With reference to health services (e.g. doctors), a portion of the 'centrally located' services will be transferred to the larger centres to reflect a move towards 'community-based' treatment options. Therefore, there will be a slight increase in the health care that is delivered from centres that are close to communities.
- The Port's land holdings are extensive and this asset has the potential to accommodate substantial growth. However, this land is generally excluded from the assessment. A portion of the transport related growth is allocated to the port area but other industrial type employment could be accommodated in the location (e.g. Sulphur Point and Mt. Manganui North CAUs). If the Port decides to develop some of its land holding for other uses (e.g. warehousing) then it would change the overall distribution of employment. However, the likelihood of large scale shifts in the current activity is seen as low.
- The airport environs is a location that has strategic value and the airport operations need to be protected. We have considered the noise contour map (in the District Plan) and there doesn't appear to be an issue. Air transport growth was not particularly strong and the current location should be

¹⁶ We use Modified Employee Counts (MEC) as measure of employment. It includes working proprietors and employees (counts).



able to accommodate growth for the foreseeable future (i.e. we do not expect the airport to relocate). However, the airport environs include a large portion of land that could be developed for other industrial type activities. Currently, these activities and areas are not included in the allocation process. In other words, we are not allocating growth to the airport's land area.

- Vacant land's development potential is based on the 'available vacant' area as listed in 'SmartGrowth - Development Trends. Technical Report 2016' surveyed in January 2015. Our analysis and modelling excludes the uptake of business land since the 2015 report¹⁷. We note that the vacant land includes the 'total site' suggesting that this is not the total area that could be used for business because a portion of the area will be used for infrastructure (roads, telecommunication and stormwater management, etc.). The mentioned report states that around a quarter (25%) of greenfield area is taken up by services. Similarly, some areas have unique development challenges. For example, we believe that the Te Maunga area is subject to flooding limiting its relative attractiveness as an investment location¹⁸. We assume that these limitations are reflected in the development timelines and the estimates of the available space. With reference to the development timelines, we have assumed that if a development site is more 'complicated' to develop, then growth would go to other locations first. Over time, as the economic (financial) attributes of the sites change, it is anticipated that these locations would become relatively more attractive. This will then trigger the development of these locations.
- The assessment covers a long timeframe and new technologies will come along, changing how businesses use labour, interact with each other and changing traffic demand and patterns. The exact nature of this change is however unknown and difficult to predict. For this assessment, we have assumed that the relationship between employment, business activity and land use patterns remain relatively stable. Some studies have found that often the introduction of new technologies may decrease employment in one occupation within an industry, but will stimulate employment in other occupations in that industry as well as other parts of the wider economy (so that the net change is marginal). Further, an increase in production efficiency reduces the price of products, increasing real income and increasing demand for other goods. In light of the relatively narrow sectoral classification used for the Traffic Zones (only five sectors), the potential employment effects of technology (spatial patterns and size) are expected to be somewhat muted. Of course, at a finer sectoral level a more complex picture is likely to emerge. With reference to telecommuting, we have allowed for service-type activities to be delivered from residential areas (i.e. home). However, the growth is tied to the growth of the overall sector. This implies that the proportion of employment that telecommutes is expected to remain relatively stable.
- The assessment uses the business location classification to allocate the retail (and associated) employment. Essentially, a share of growth is allocated to the higher order centres in a way that maintains their (relative) share of total employment.
- In some instances, there appears to be employment in locations that are counter-intuitive. Construction is classified as 'industry' so a trades person with his/her business registered to a residential location will show up as an 'industrial employee' in a residential area. A similar issue is evident for some service activities. The SG service sector includes sector 'N' – Administrative and Support Services (2006 ANZSIC) and one would equate this with a service/commercial type activity.

¹⁷ Tauranga City Industrial Land Survey Report, April 2015.

¹⁸ Because of the cost implications.



However, sector N includes activities such as packaging services (N732000¹⁹) that could be associated with more 'industrial locations'. For this reason, there are some 'service employment' located in 'industrial areas'.

The next section provides a high level overview of the findings.

¹⁹ This is Level 4 or 6Digit classification of the ANZSIC.

3 Findings

This section provides a high level summary of the key findings. To assist with presenting the information, Census area units (CAUs) are used as spatial scale. The section points out some of the key considerations and areas where the findings will vary in the short term. The ongoing population growth and its potential implications are explored. The section concludes with a brief overview of key sensitivities and aspects not included in the assessment.

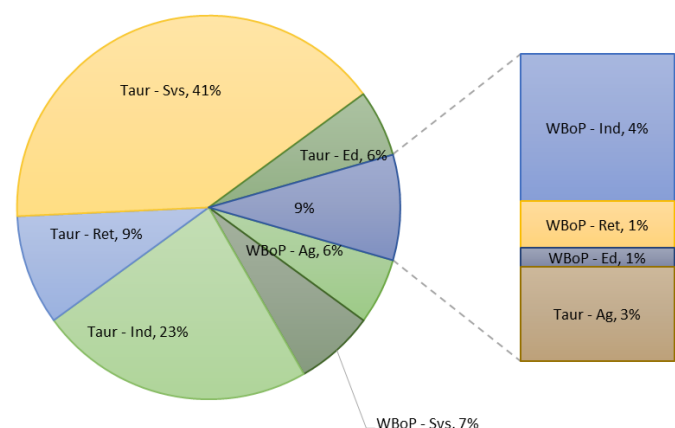
3.1 Key trends

The key trends as presented by focusing on the headline totals. Based on the approach and the assumptions, the modelling suggests the total employment is expected to grow by 39,375 by 2063 and most of this growth is expected to occur by 2048/2050. In Tauranga, employment is expected to increase by 30,900 by 2050 (a 46.7% increase) and WBoP's employment is projected to grow by some 6,880 (+36.4%) by the same period. The growth peaks around 2048/2050 and slows down after this point with Tauranga adding another 1.2% to employment and WBoP adding 1.5% between 2050 and 2063. This slowdown is a function of (and directly related to) the population growth projections²⁰ that we used in our modelling.

The following figures show the trends for each of the five SmartGrowth sectors for Tauranga and WBoP respectively. The different sectors are all expected to grow. A portion of this growth is related to shifts in the sub-region's population while the growing economy, in itself, is also responsible for generating demand growth. The SmartGrowth sectors are expected to grow as follows over the long term:

- WBoP
 - Agriculture 34.7% (2,200)
 - Industry 35.9% (1,680)
 - Retail 30.7% (530)
 - Services 50.3% (2,640)
 - Education 23.9% (215)
- Tauranga
 - Agriculture 37.1% (1,070)
 - Industry 45.6% (9,160)
 - Retail 32.2% (3,655)
 - Services 59.1% (16,010)
 - Education 46.3% (2,215).

Figure 3.1: Share of Growth



²⁰ As prepared by NIDEA.



Figure 3.2: Employment by SG sector - WBoP

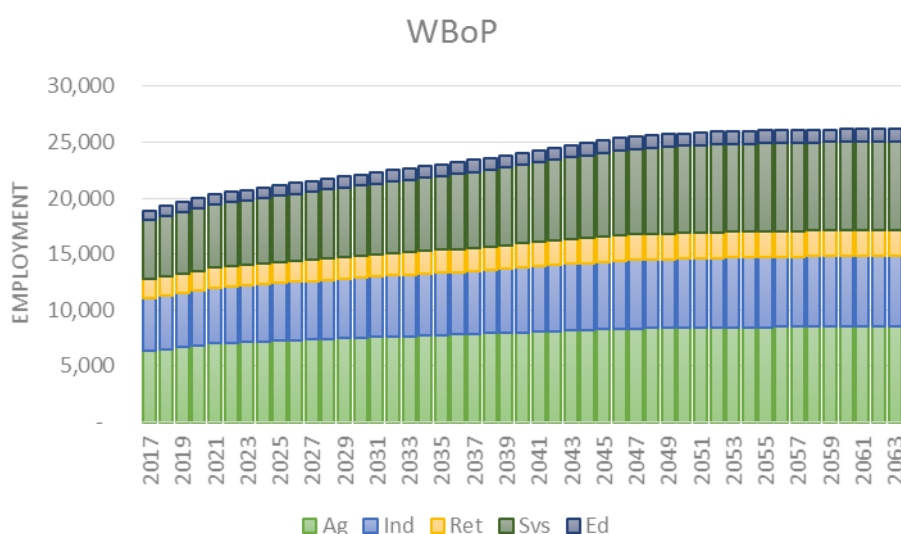
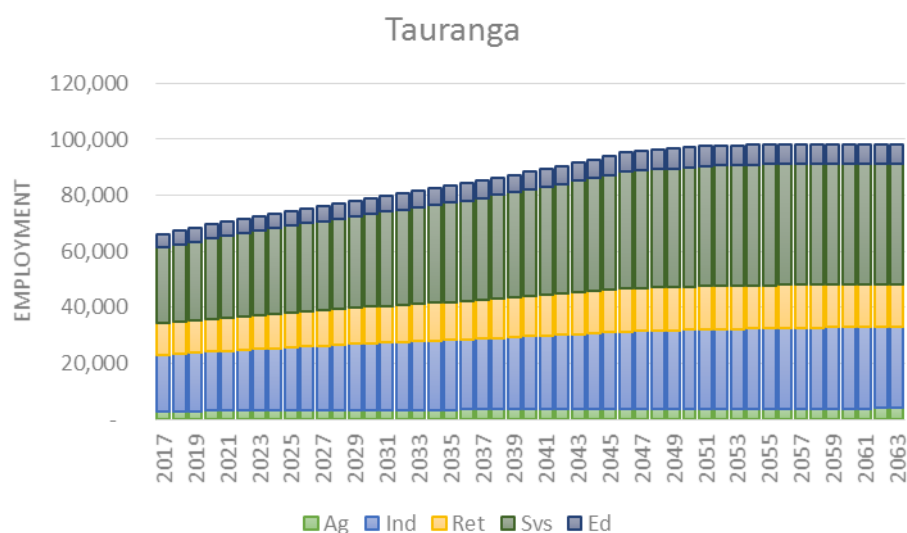


Figure 3.3: Employment by SG sector - Tauranga



More than three quarters (82%) of the employment growth is expected to be located in Tauranga and this is dominated by shifts in service related employment. Figure 3.1 illustrates the distribution of the growth (out to 2063) by SmartGrowth sector for WBoP or Tauranga. The city's service employment is expected to capture some 41% of the sub-region's growth. This is followed by city's industry contributing a quarter (23%) of employment growth.

The general shift towards services is illustrated by the above figure with almost half (47%) of the sub-region's employment growth expected from services.

3.1.1 Spatial distribution of employment outlook

At a more micro level (i.e. within district/city), the employment growth was allocated to different business areas or locations. The process used to allocate the employment growth to the different business areas is discussed in Section 2.4. Using the business areas, as used by M.E, shows:

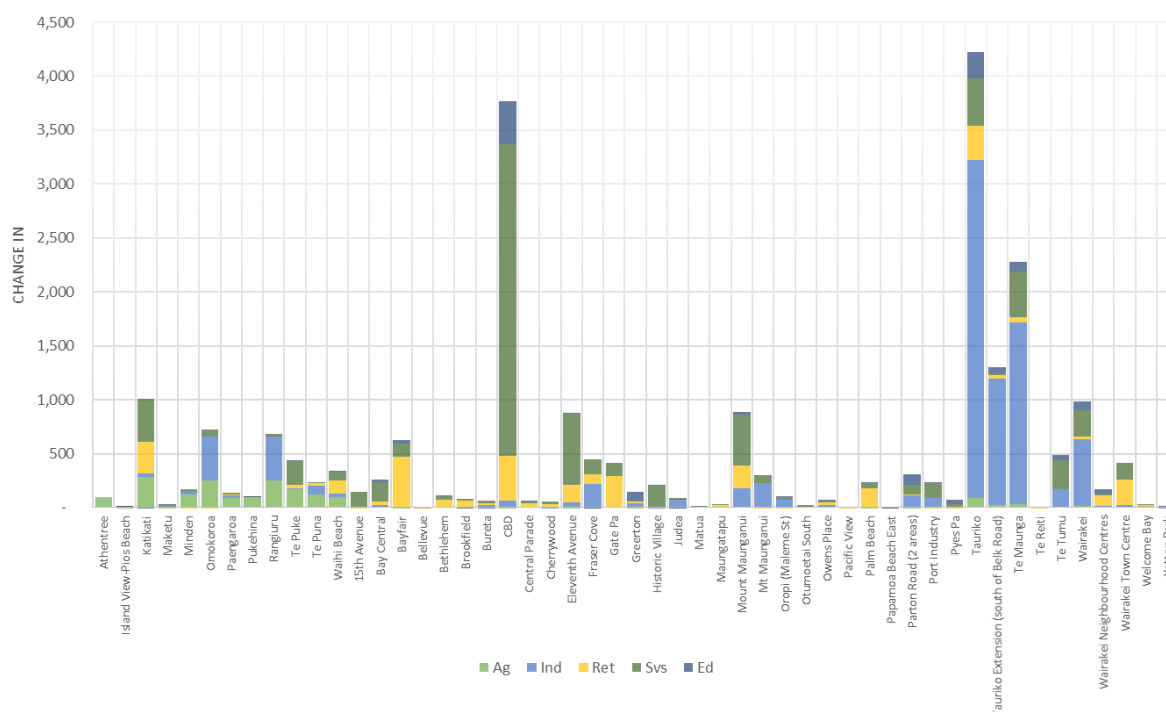
- The distribution of growth across the sub-region,
- The relative distribution of growth across sectors, and
- The potential change in the level of activity (employment) expected in the different business locations.

Importantly, the business locations that we used in this assessment should not be seen as ‘centres’. The reason for defining different business areas and locations was to reduce the number of locations to deal with, to make the analysis more manageable. The sub-region is made up of 1,470 meshblocks²¹ and dealing with this number of individual areas is difficult. Therefore, we defined around fifty ‘business areas’ based on current business zoning as well as a visual inspection of where the businesses are located.


Appendix 2 lists the meshblocks associated with each business area. The meshblocks that are not in the appendix are then treated as ‘out of zone’. This label does not have any ‘planning’ connection and should not be interpreted as implying that the activities are illegal or in inappropriate locations (identifying such activities is beyond the scope of our report). The spatial distribution of the employment growth is presented below.

Figure 3.4 shows the spatial distribution of the growth.

Figure 3.4: Spatial distribution of Employment Growth (2017-2063)



²¹ This number varies depending on whether the marine and island meshblocks are included or not.



Note: the 'Mt Maunganui' area relates to the industrial area whereas the 'Mount Maunganui' area includes the commercial and retail areas. This naming convention also applies to other figures and tables in the rest of the report.

From the above, the following key observations are noted:

- The industrial growth is concentrated around the growth area of Tauriko (including the Belk Road extension) as well as Te Maunga (Note: Te Maunga is not expected to capture any material share of the growth until the 2050s when it captures a large portion of the growth). It is understood that the availability of this area for development will be subject to engineering costs due to the underlying soil conditions and flooding issues. In addition, considerations such as access and ownership will need to be addressed before this area can be developed. This suggests that the location of these jobs are uncertain. It could be that the growth associated with this area will be captured in the wider region (e.g. Rangiuru).
- A large share of the growth is expected in the 'out of zone' locations. While not shown in the above figure, the 'out of zone' category is substantial, accommodating a projected 15,645 jobs. Services are expected to account for 70% of this 'out of zone' growth.
- The retail areas are expected to see a level of consolidation with marked growth in retail employment in the existing retail locations. The growth is expected to concentrate around the large(r) retail centres associated with the CBD, Palm Beach, Bayfair and the retail offer along Cameron Road (in the Gate Pa area unit).
- With reference to the smaller business locations (e.g. neighbourhood centres), these areas are expected to respond to population growth by adding employees to service the larger population base. The overall scale of the employment growth is expected to be modest.
- In WBoP, the employment growth is expected to remain relatively concentrated around the district's towns, including Katikati, Te Puke and growth areas such as Rangiuru and Omokoroa. However, it is expected that most of the wider region's growth will be captured in Tauranga because it is the main economic area. Therefore, the WBoP will capture the growth that is related to the land resource (i.e. agriculture/horticulture), population shifts and some industrial growth.

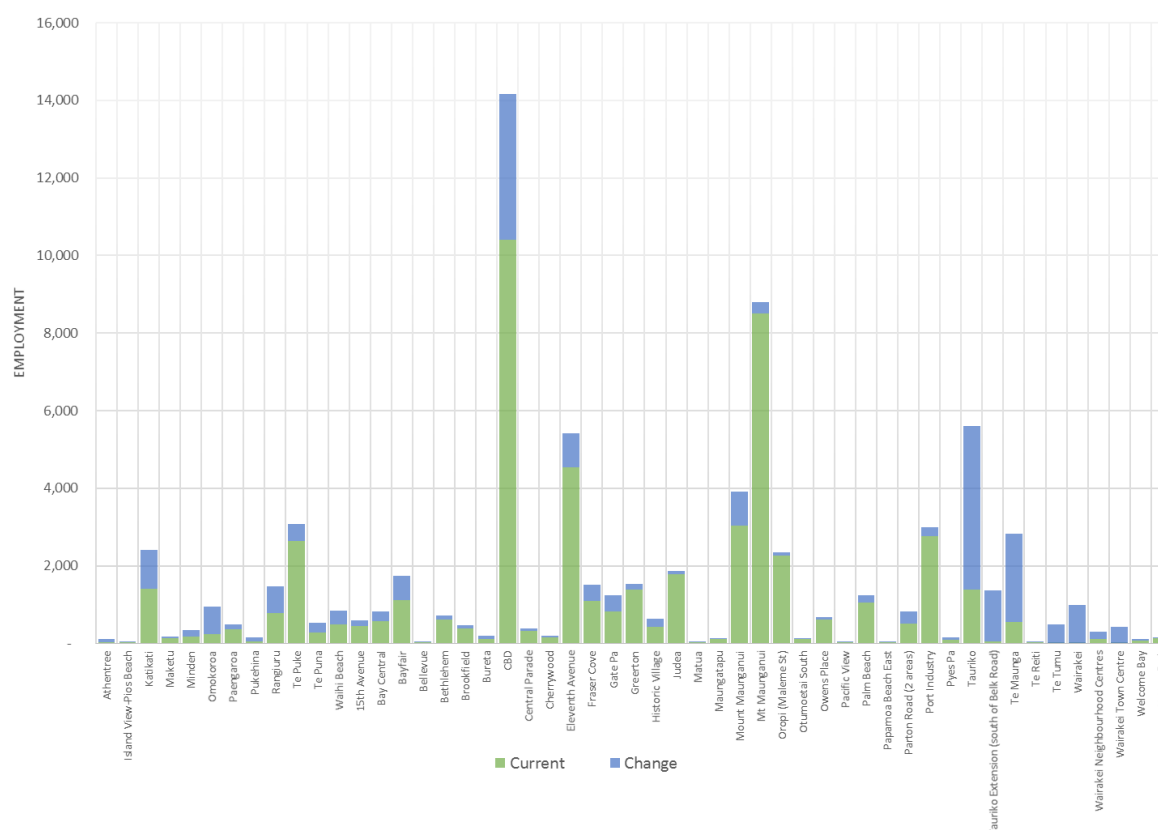
Another way to look at the projected employment change is to express it relative to the current situation. This can be done using the absolute value change (+/- employment) and/or the percentage change. In the context of this study, the percentage change approach provides misleading and confusing results. This is because expressing a growth of a low (or zero) base will result in a high result. This is likely to be the case for greenfield and recently developed areas. Conversely, areas that are already close to capacity (e.g. the industrial area at Mt Maunganui) could have a large change in absolute terms but a small percentage change. Therefore, we show the employment growth relative to the current employment using absolute terms. Appendix 3 shows the relative change at a Census Area Unit level (over time and for each of the SmartGrowth sectors). Figure 3.5 shows the relative change for the different business locations and the main observations are:

- The Tauranga CBD is expected to remain a key business location. Going forward, the CBD is expected to retain its status as the primary business hub. Employment in the CBD is expected to increase strongly – rising by a more than a third (36%). Most of the increase is expected in the service industries with a smaller (relative) lift in education and retail jobs.
- The industrial locations of Tauriko (and the Belk Road extension) as well as Te Maunga are expected to capture most of Tauranga's industrial growth. The existing industrial locations, such as Mt Maunganui, Oropi (Maleme Street) and Judea will see some growth but these areas have

limited vacant areas so most of the growth is likely to be in the form of redevelopment, i.e. an increase in density as sites are redeveloped. However the overall scale of such redevelopment is likely to be limited.

- Virtually all business locations around the sub-region are expected to see some degree of employment growth. In general, the business locations around Tauranga will see higher growth than those in WBoP. This is related to the population growth as well as the overall size of Tauranga's economy.

Figure 3.5: Relative change (Employment)



The growth in employment in the smaller business locations is, of course, subject to the availability of suitable space (land and buildings) as well as the ability to deliver additional business space to accommodate the growth. In our assessment, we have assumed²² that the required space will be delivered. For example, in the Mount Maunganui area (i.e. the commercial and business areas), it is estimated that the total employment will grow by 29% out to 2063 – that is an increase of 885 jobs.

It is worth noting that the overall scale of change is substantial but the timeframe being considered is long. In other words, while the total scale of change is expected to be large, the change is expected to occur over the medium to long term. Crucially, this is based on the NIDEA population projections and the growth assumptions. In light of Statistics New Zealand's recently released population projections, ongoing and strong migration as well as the continued strength in NZ and the sub-region's economy, it is plausible that in the short to medium term, the growth will be higher (this is discussed in more detail in section 3.3).

²² This is an important assumption and if this is not the case, then the employment distribution is liable to vary from that presented in our work.



It is important to note that the distribution of growth in WBoP is less certain and that the eventual spatial patterns could be different from those estimated in our report. Developing Rangiuru, specifically the timing of when this area becomes available, will affect the employment growth in the nearby areas (e.g. Te Puke). It is suggested that, going forward, this development be monitored and the employment distribution be adjusted (manually²³).

Similarly, once the planning around the growth areas around Te Tumu and Wairakei have been completed, the employment projections (and spatial distributions) should be reviewed and adjusted accordingly. Our assessment includes these two areas and allocates a portion of the growth to them. In the Te Tumu case, we are aware of the Wairakei/Te Tumu Framework Plan (final draft). This document makes suggestions around Mixed Industry Business Areas (MIBAs) and provides almost 90ha of land for these activities. We have allocated a small portion of growth to this area but because the potential scale of the area that would be available for development is currently unclear (the report states that an area of between 77ha and 103ha will be provided in the employment precinct), we have not 'fully²⁴ allocated' growth to this area. If we were to allocate growth to the MIBA area, then it will reduce the employment in other business locations (specifically, Tauriko, the Gravatt/Palm Beach area units and the City's other retail, business and commercial locations).

3.2 Intensification

As part of the assessment, a separate scenario was run. This scenario covers Tauranga City and focuses on the potential implications of intensifying residential development around the CBD, Mount Maunganui and the coastal strip. This refocusing is based on redirecting development away from greenfield developments. As discussed in Section 2.6, intensifying development will have different effects on economic activity, including the spatial distribution of employment. Table 3.1 shows the percentage change as well as employment change (relative to the greenfield scenario) for the business locations throughout Tauranga.

The main shifts are expected around the CBD and Eleventh Avenue areas, as well as the Mount Maunganui area (excluding the industrial area). As expected, the Te Tumu area will not see the same level of growth as is anticipated under the greenfield scenario and, consequently, the employment levels in this location will be markedly lower. However, the surrounding areas (i.e. Papamoa Beach East CAU, Doncaster CAU and Palm Springs CAU²⁵) will still see growth in households and population and this will affect the outlook for the local employment levels.

Most of the business areas located in the residential areas (such as neighbourhood centres) are expected to see a general lift in employment compared to the greenfield scenario. This is because the number of people (and households) located in the immediate vicinity are expected to increase over the greenfield scenario. In absolute number and percentage terms, the expected changes are modest, falling in the 5-15 employee range.

²³ This can be done by simply 'shifting' and 'reallocating' the employment between traffic zones.


²⁴ That is, we did not allocate growth to this area up to the maximum that could be accommodated. This is because such an allocation would capture a share from the (limited) employment in the City.

²⁵ Excluding Te Tumu

Table 3.1: Percentage change in employment (relative to Greenfield; 2063)

Business Area	Percentage change	Additional Employment
15th Avenue	-3%	0
Bay Central	-4%	-10
Bayfair	15%	90
Bellevue	6%	0
Bethlehem	18%	20
Brookfield	10%	10
Bureta	7%	0
CBD	12%	470
Central Parade	43%	30
Cherrywood	-9%	0
Eleventh Avenue	54%	470
Fraser Cove	14%	60
Gate Pa	11%	40
Greerton	54%	80
Historic Village	0%	0
Judea	0%	0
Matua	2%	0
Maungatapu	10%	0
Mount Maunganui (the retail and commercial areas)	11%	100
Mt Maunganui (the industrial areas)	0%	0
Oropi (Maleme St)	-41%	-40
Otumoetai South	6%	0
Owens Place	32%	20
Pacific View	53%	0
Palm Beach	-8%	-10
Papamoa Beach East	Not applicable	0
Parton Road (2 areas)	2%	10
Port Industry	0%	0
Pyes Pa	-8%	-10
Tauriko	0%	0
Te Maunga	-2%	-40
Te Reiti	Not applicable	0
Te Tumu	-54%	-440
Wairakei	-2%	-20
Wairakei Neighbourhood Centres	-1%	0
Wairakei Town Centre	0%	0
Welcome Bay	7%	0
Yatton Park	48%	10

Clearly, the intensification scenario will result in a markedly different spatial pattern for employment with an increase in the number of jobs in key locations such as the CBD. It is important to note that the effects of intensification flow through to activities that are closely related to population and households (i.e. household demand and working from home type activities). Similarly, education and health/medical



activities are also affected by the location of households. Conversely, the spatial distribution of industrial type activities are not as sensitive to residential intensification. However, intensification could give rise to reverse sensitivity issues that will need to be managed. In our process, we did not set out to identify locations that could be affected by reverse sensitivity issues (this is a separate process that will need to be undertaken).

3.3 Sensitivities

There are a number of factors and forces that could alter the overall scale, and distribution, of the employment projections. Notwithstanding the uncertainties mentioned earlier, employment projections are sensitive to the overall performance of the economy and population projections. Global and national recessions are likely to lead to a slowdown in employment growth rates. The main implication of slowdowns and cyclical movements, is that the year on year employment projections are likely to be lower, and consequently there would be a delay in when the projected employment levels are realised. It is important to understand the relative sensitivity of the employment projections to shifts in key input parameters and a high level sensitivity analysis illustrates this level of sensitivity.

For the sensitivity analysis, we changed two variables in Tauranga and WBoP to show the results of using alternative growth rates for population and exports. These variables flow through affecting the size of the economy and therefore the employment requirements.

The results suggest that under a high(er)²⁶ export growth situation, the employment outlook for Tauranga is relatively stable with the total change in employment being less than 1.5%. In employment terms, this is around 1,470 additional jobs. Under the low²⁷ export setting (exports grow 20% slower) the total employment in Tauranga will be around 860 less (by 2063) than the medium growth settings. This is a difference of -1% (by 2063).

A high population growth in WBoP will have a flow on effect on employment in Tauranga (with employment up 1.5% relative to the medium scenario). However, this effect's direction is not reversed if Tauranga experiences a different population growth profile with the flow-on effect materially smaller (on WBoP's employment).

The WBoP is more sensitive to higher growth scenarios. This is probably due to the smaller size of the economy and its internal linkages. For example, combining high population growth and high exports will lift total employment in WBoP by around 3.1% (at 2063); this equals around 790 employees in WBoP. However, the flow on effects on Tauranga²⁸ is not as pronounced with the change in total employment coming in at 275 jobs or less than 0.5%.


During the SmartGrowth Leadership Group meeting (15/03/2017) a number of points relating to the scale of change were raised, including:

- The level of growth in the kiwifruit industry,
- The potential contribution of the Maori economy to overall growth, and
- The potential implications of faster population growth in the short to near term.

²⁶ This assumes that all exporting sectors' exports grow 20% faster than the BAU.

²⁷ This assumes that all exporting sectors' exports grow 20% slower than the BAU.

²⁸ This example assumes that the



The points are explored below.

3.3.1 Kiwifruit industry growth

The kiwifruit industry is a key part of the WBoP economy. During interviews with local stakeholders (specifically New Zealand Kiwifruit Growers Inc; NZKGI) who provided information about the historic growth of the local industry going back to 2000/1. In addition, NZKGI shared their forecast information for the volume of kiwifruit harvest over the next 5 years (out to 2020/21). Using historic volumes suggests that the industry has grown by around 2.6% per annum over the past 15 years. Instead of using the forecasted growth (10.4% compound growth per year), we used the historic growth rates as basis for estimating the employment totals and adjusted these up to the feedback from the leadership group and WBoP staff. The growth was increased to align with the estimated increase in the industry's employment requirements over the next five years or so.

By using a higher growth rate, the employment totals for not only the horticulture industry but also the rest of the WBoP and Tauranga economies, were affected and consequently higher. We adjusted the horticulture sector's growth up (to match the high growth outlook over the next 5 years) and increased the employment to align with WBoP estimates. We lifted exports by an additional 5% per year (every year) for the next five years. This increase translates into an extra 420 jobs in the kiwifruit industry (over the next five years, full time workers). This higher growth then flows through into the Tauranga economy lifting the employment need by around 320 (by 2063 for the total economy)²⁹. For the WBoP economy, the higher base is projected to translate into an additional 765 jobs by 2063 (over the wider economy).

3.3.2 Economic role and contribution of the Māori economy

The Māori economy is an important part of the New Zealand economy – this importance is due to the relative size of the Māori labour force as well as the economic role that Māori businesses play.


According to Westpac,³⁰ Māori account for 15% of the population and this share is expected to increase. This relatively younger population base will form an increasingly important part of the NZ labour market. This is also the case for the Tauranga and WBoP areas. In our modelling, we relied directly on the NIDEA projections and we did not review those projections. However, a high level overview of the NIDEA report³¹ suggests that the Māori segment of the population was considered and that the distinct features of this segment were included in the modelling. Specifically, the younger age structure, the resulting impacts on natural growth, as well as the flow on implications on the labour force appear to be captured in the modelling. However, the propensity of young Māori to migrate out of the area is also highlighted in the report with an indication of the implication of natural population increase being noted.

There is limited new research around the economic value, size and contribution of the Māori economy, specifically for the WBoP and Tauranga areas. The 2013 Māori Economic Development Strategy for the Bay of Plenty puts the value of the Māori economy at \$1.2bn (11% of GDP). While this covers the entire

²⁹ Relative to the unadjusted or baseline kiwifruit industry as presented in our first draft report.

³⁰ Westpac Bank. Industry Insights: Māori in the NZ economy. 6 September 2016. Report downloaded from: <https://www.westpac.co.nz/assets/Business/Economic-Updates/2016/Bulletins-2016/Industry-Insights-Māori-in-the-NZ-Economy-September-2016.pdf>

³¹ 2014 Review of Demographics and Labour Force Projections for the Bay of Plenty for the Period 2013-2063.



Bay of Plenty, it is nevertheless an important (and sizable) part. The asset base underpinning this was estimated at some \$8.6bn. It is not possible to readily³² identify the sectoral contributions at a Tauranga and WBoP level.

The contribution is recorded as part of official statistics so the Māori economy is captured, but just not as a separate or distinctive part of the (official) sectors. Our analysis includes the entire economy at a sectoral level. This means that the Māori economy is included, but it is not separately identifiable³³. To put the opportunity into context we use a hypothetical example: if the Māori economy is 11% of the WBoP and Tauranga economies, and it achieves a 1% growth premium (e.g. 2% growth *plus* 1% growth premium = 3% growth rate) then by 2063, the total economy would be 6.4% larger. This highlights the potential role and contribution of the Māori economy.

3.3.3 Alternative population growth profile

The employment projections are based on the NIDEA estimates. These estimates vary from Statistics New Zealand's recently released population projections. The main difference between the NIDEA and SNZ projections are:

- The SNZ projections are higher in the short-medium term (next 15 years or so),
- The NIDEA projections are higher over the medium to longer term.

With reference to the SNZ population projections, SNZ provides (at a national level) the results of their modelling at different percentiles (i.e. different outcomes). Comparing the 25th and 75th percentile shows a fair degree of variance – for example the size labour force (people aged between 15 and 65 years) range between 89.9% and 109.8% of the median projections (for 2063). With reference to the short term (2033), this variance is between 96.3% and 104.2% of the median projections. If we apply these national level variances to the study, then even the low population projections are higher than those presented by NIDEA.

Bringing the population growth forward and concentrating it over the short term is likely to have a number of impacts, including:

- A larger population base will place additional pressure on the sub-region's infrastructure (including but not limited to roads, wastewater, parks and environmental assets, natural amenity and the general environment),
- The extra growth will require an investment response that will require financial resources. Having more growth over a shorter time means that the timeframe over which the investment is required is shorter. Therefore prioritising investment in an open, transparent and robust way will be paramount.
- Concentrating the growth in the short term adds uncertainty about the scale of growth that could be expected (and sustained) over the longer term.

While we did not review the latest projections in detail, it is worth considering the relationship between the population totals and age structure because it will impact on the labour force (availability and the participation rate). If the population growth occurs in a way that maintains the ratio of 'working age people

³² Without undertaking a separate piece of analysis (outside the scope of our brief).

³³ It is possible to identify the role and contribution its role but this is outside the scope of this project.



to total population' then the faster growth is likely to alleviate some pressure on business to find employees. But this situation could reverse in future years when the population growth is slower.

Given that the population estimates used to prepare the employment projections will probably be lower than the eventual (actual) population figures, the employment projections are likely to be understated in the short term.



4 Concluding remarks

The employment projections form an important input into the transport modelling. The employment projections are also useful in assessing the likely demand for business and industrial land. Given the dynamic nature of the economy, population and how investment decisions are made, the updated projections show one possible spatial distribution pattern that is based on trends. These projections are not ‘predictions’ and should not be treated as such.

In light of the population constraints and the strong growth over the past three years or so, we suggest that the employment projections be reviewed annually. The review should update the starting values (for each location and sector) using the latest SNZ information – specifically the Business Demography Survey information and the population projections. The BD information is normally released towards the end of October of each year. When other information pieces are updated (such as the industrial land vacancy register) the new(er) information should also be included in the model.

The employment projections will be useful for other work streams and requirements such as the National Policy Statement (NPS) on Urban Development Capacity. However, the timeframes covered by the UDS are shorter than those used in the employment projections. To better reflect the volatility and short term movements, the employment projections will need to be refined and adjusted to better show the shorter timeframes, recent growth trends, local development pressures and other emerging issues. This includes the ‘local level’ employment trends in the high pressure areas (e.g. the commercial area in Mt Maunganui) and how it performs relative to population growth. Similarly, for the NPS, we suggest using a more aggressive set of growth projections.³⁴ This will also ensure that sufficient land is available for development (over the short-medium term) so that the benefits of having the land available for the market can be realised. The ability to have the land available to the market (i.e. readiness to bring the land to the market in a relatively short space of time) was identified as an important issue in the strong uptake and development of Tauriko in the post-GFC environment.

³⁴ While also reducing the restrictions of population growth on the overall economic outlook.

Appendix 1: Sector Definition

SmartGrowth Sector	2006 ANZSIC Classifications	
Agriculture	A	Agriculture, Forestry and Fishing
	B	Mining
Industry	C	Manufacturing
	D	Electricity, Gas, Water and Waste Services
	E	Construction
	F	Wholesale Trade
	I	Transport, Postal and Warehousing
Retail	G	Retail Trade
	H	Accommodation and Food Services
Services	J	Information Media and Telecommunications
	K	Financial and Insurance Services
	L	Rental, Hiring and Real Estate Services
	M	Professional, Scientific and Technical Services
	N	Administrative and Support Services
	O	Public Administration and Safety
	Q	Health Care and Social Assistance
	R	Arts and Recreation Services
	S	Other Services
Education	P	Education and Training

Appendix 2: Business Areas - Definitions


1081004	Waihi Beach	1162600	Judea	1179301	Maungatapu
1081200	Waihi Beach	1162702	Judea	1179605	Welcome Bay
1081500	Waihi Beach	1162800	Port Industry	1180201	Welcome Bay
1081600	Waihi Beach	1162901	Bay Central	1188802	Port Industry
1081700	Waihi Beach	1163001	Bay Central	1188808	Port Industry
1081900	Waihi Beach	1163002	Bay Central	1190200	Bethlehem
1082201	Waihi Beach	1163100	CBD	1190602	Bethlehem
1083204	Waihi Beach	1163200	CBD	1191202	Tauriko
1180700	Athenree	1163300	CBD	1191203	Tauriko
1181100	Waihi Beach	1163400	CBD	1191204	Tauriko
1181301	Island View-Pios Beach	1163500	CBD	1191205	Tauriko
1181402	Island View-Pios Beach	1163600	CBD	1191206	Tauriko
1182702	Katikati	1163700	CBD	1191803	Tauriko
1182703	Katikati	1163800	CBD	1192114	Pyes Pa
1182704	Katikati	1163900	CBD	1192234	Pyes Pa
1182800	Katikati	1164000	CBD	1192800	Oropi (Maleme St)
1182900	Katikati	1164100	CBD	1194400	Mount Maunganui
1183403	Katikati	1164200	CBD	1194501	Mount Maunganui
1183501	Katikati	1164300	CBD	1194900	Mount Maunganui
1183502	Katikati	1164600	CBD	1195100	Mount Maunganui
1183803	Katikati	1164700	CBD	1195200	Mount Maunganui
1183807	Katikati	1164800	CBD	1195500	Mount Maunganui
1186000	Minden	1164900	CBD	1195600	Mount Maunganui
1186901	Omokoroa	1165000	CBD	1196100	Mount Maunganui
1187001	Omokoroa	1165100	CBD	1196200	Mount Maunganui
1187100	Omokoroa	1165200	Eleventh Avenue	1196400	Mount Maunganui
1187209	Omokoroa	1165300	CBD	1196600	Mount Maunganui
1187500	Omokoroa	1165400	Eleventh Avenue	1196700	Mount Maunganui
1188102	Te Puna	1165500	Eleventh Avenue	1197400	Central Parade
1188103	Te Puna	1165600	Eleventh Avenue	1197800	Central Parade
1188900	Minden	1165800	CBD	1200200	Mt Maunganui
1189602	Minden	1166000	Eleventh Avenue	1200900	Bayfair
1189702	Minden	1166100	Eleventh Avenue	1201300	Bayfair
1191804	Tauriko Extension (south of Belk Road)	1166200	Eleventh Avenue	1201900	Te Maunga
1207002	Te Puke	1166300	Eleventh Avenue	1202500	Bayfair
1207102	Te Puke	1166400	Eleventh Avenue	1202600	Port Industry
1208600	Maketu	1166500	Eleventh Avenue	1202700	Mount Maunganui
1208700	Maketu	1166600	Eleventh Avenue	1202800	Port Industry
1208800	Maketu	1166903	Eleventh Avenue	1202901	Mount Maunganui
1209400	Rangioru	1167000	Eleventh Avenue	1203000	Mount Maunganui
1210300	Rangioru	1167101	Eleventh Avenue	1203100	Port Industry
1211100	Paengaroa	1167102	Eleventh Avenue	1203206	Mount Maunganui
1211500	Paengaroa	1167104	Eleventh Avenue	1203300	Mt Maunganui
1211603	Paengaroa	1167601	Judea	1203400	Port Industry
1211604	Paengaroa	1167602	Eleventh Avenue	1203500	Mt Maunganui
1211900	Paengaroa	1167801	Judea	1203600	Mt Maunganui
1212201	Pukehina	1168300	Eleventh Avenue	1203700	Mt Maunganui
1212605	Pukehina	1168501	15th Avenue	1203800	Port Industry
1212615	Pukehina	1168700	15th Avenue	1203900	Mt Maunganui
1213900	Te Puke	1168800	15th Avenue	1204000	Mt Maunganui
1214201	Te Puke	1169101	15th Avenue	1204100	Mt Maunganui
1214601	Te Puke	1169202	Historic Village	1204200	Mt Maunganui
1214700	Te Puke	1170002	Fraser Cove	1204300	Mt Maunganui
1214800	Te Puke	1170100	Fraser Cove	1204401	Mt Maunganui
1214900	Te Puke	1170500	Historic Village	1204403	Owens Place
1215100	Te Puke	1170700	Historic Village	1204502	Port Industry
1215400	Te Puke	1171500	Gate Pa	1204705	Papamoa Beach East
1215500	Te Puke	1171600	Gate Pa	1204708	Palm Beach
1215600	Te Puke	1171700	Gate Pa	1204714	Parton Road (2 areas)
1215700	Te Puke	1172800	Gate Pa	1204813	Wairakei Neighbourhood Centres
1215900	Te Puke	1172900	Fraser Cove	1204816	Wairakei Neighbourhood Centres
1153505	Matua	1173000	Yatton Park	1204817	Wairakei Neighbourhood Centres
1154102	Matua	1173103	Yatton Park	1204820	Wairakei Neighbourhood Centres
1154601	Cherrywood	1174702	Greerton	1204927	Pacific View
1154804	Cherrywood	1175000	Greerton	1205005	Palm Beach
1155000	Cherrywood	1175100	Greerton	1205019	Palm Beach




1155800	Bureta	1175201	Greerton	1205072	Palm Beach
1155900	Bureta	1175300	Greerton	1205409	Owens Place
1156400	Bureta	1175400	Greerton	1205502	Te Maunga
1156900	Otumoetai South	1175500	Greerton	1206701	Te Maunga
1157000	Otumoetai South	1175600	Greerton	1206704	Te Maunga
1158200	Otumoetai South	1175800	Greerton	1206806	Parton Road (2 areas)
1159000	Bellevue	1176500	Greerton	1206830	Parton Road (2 areas)
1160700	Brookfield	1176900	Oropi (Maleme St)	1206904	Wairakei
1161002	Brookfield	1177000	Oropi (Maleme St)	1206911	Wairakei Neighbourhood Centres
1161511	Judea	1177100	Oropi (Maleme St)	1206914	Wairakei
1161516	Te Reiti	1177202	Oropi (Maleme St)	1206923	Wairakei Town Centre
1161600	Te Reiti	1177300	Oropi (Maleme St)	1206924	Wairakei Town Centre
1162200	Judea	1177500	Oropi (Maleme St)	1209200	Te Tumu
1162300	Judea	1178500	Maungatapu	1177400	Greerton

Appendix 3: Change per Census Area Unit and Smart Growth Sectors


Area Unit	Smart Growth Sector	2020	2030	2040	2050	2060
Waihi Beach	Ag	120	160	180	200	200
Waihi Beach	Ind	140	140	160	180	180
Waihi Beach	Ret	290	320	350	390	410
Waihi Beach	Svs	180	210	230	270	280
Waihi Beach	Ed	40	40	40	40	40
Kaimai	Ag	480	500	530	540	540
Kaimai	Ind	360	520	1,560	1,570	1,590
Kaimai	Ret	80	90	120	120	120
Kaimai	Svs	280	330	370	410	420
Kaimai	Ed	80	90	140	150	140
Athenree	Ag	30	60	80	100	100
Athenree	Ind	20	20	20	30	30
Athenree	Ret	10	20	20	20	20
Athenree	Svs	60	70	70	80	80
Athenree	Ed	-	-	-	-	-
Inlet-Tauranga Harbour North	Ag	-	-	-	-	-
Inlet-Tauranga Harbour North	Ind	-	-	-	-	-
Inlet-Tauranga Harbour North	Ret	-	-	-	-	-
Inlet-Tauranga Harbour North	Svs	-	-	-	-	-
Inlet-Tauranga Harbour North	Ed	-	-	-	-	-
Tahawai	Ag	310	320	330	330	330
Tahawai	Ind	100	100	110	120	120
Tahawai	Ret	10	10	10	10	10
Tahawai	Svs	60	70	80	90	90
Tahawai	Ed	-	-	-	-	-
Island View-Pios Beach	Ag	-	-	-	-	-
Island View-Pios Beach	Ind	30	30	30	30	30
Island View-Pios Beach	Ret	30	30	30	30	30
Island View-Pios Beach	Svs	30	30	30	40	40
Island View-Pios Beach	Ed	10	10	10	10	10
Aongatete	Ag	680	710	740	760	760
Aongatete	Ind	370	390	400	410	420
Aongatete	Ret	40	50	50	60	60
Aongatete	Svs	610	680	760	850	870
Aongatete	Ed	20	20	20	30	30
Katikati Community	Ag	380	470	520	570	600
Katikati Community	Ind	410	430	440	440	450
Katikati Community	Ret	390	450	510	590	640
Katikati Community	Svs	600	720	840	990	1,040
Katikati Community	Ed	180	190	200	210	210
Matakana Island	Ag	50	50	50	50	50
Matakana Island	Ind	10	10	10	10	10
Matakana Island	Ret	-	-	-	-	-
Matakana Island	Svs	20	20	30	30	30
Matakana Island	Ed	20	10	10	20	20




Area Unit	Smart Growth Sector	2020	2030	2040	2050	2060
Minden	Ag	390	440	480	500	520
Minden	Ind	300	330	360	380	380
Minden	Ret	60	70	70	70	60
Minden	Svs	300	330	380	420	420
Minden	Ed	40	40	50	50	50
Omokoroa	Ag	60	160	220	270	280
Omokoroa	Ind	270	440	540	600	620
Omokoroa	Ret	80	90	90	90	80
Omokoroa	Svs	170	220	240	260	260
Omokoroa	Ed	20	30	50	50	50
Inlet-Tauranga Harbour Omokoroa	Ag	-	-	-	-	-
Inlet-Tauranga Harbour Omokoroa	Ind	-	-	-	-	-
Inlet-Tauranga Harbour Omokoroa	Ret	-	-	-	-	-
Inlet-Tauranga Harbour Omokoroa	Svs	-	-	-	-	-
Inlet-Tauranga Harbour Omokoroa	Ed	-	-	-	-	-
Te Puna	Ag	290	340	380	410	420
Te Puna	Ind	400	430	450	480	510
Te Puna	Ret	90	110	120	130	110
Te Puna	Svs	360	400	450	510	510
Te Puna	Ed	110	140	180	190	200
Ohauti-Ngapeke	Ag	10	10	20	20	20
Ohauti-Ngapeke	Ind	50	50	50	60	60
Ohauti-Ngapeke	Ret	-	-	-	-	-
Ohauti-Ngapeke	Svs	20	20	20	20	20
Ohauti-Ngapeke	Ed	-	-	-	-	-
Upper Papamoa	Ag	510	530	540	550	550
Upper Papamoa	Ind	390	430	430	450	470
Upper Papamoa	Ret	10	10	10	10	10
Upper Papamoa	Svs	580	660	750	840	850
Upper Papamoa	Ed	-	-	-	-	-
Te Puke West	Ag	710	730	750	760	770
Te Puke West	Ind	390	400	400	410	410
Te Puke West	Ret	30	30	30	30	20
Te Puke West	Svs	560	570	590	610	610
Te Puke West	Ed	50	50	50	50	50
Te Puke East	Ag	960	1,010	1,040	1,070	1,070
Te Puke East	Ind	350	360	370	380	380
Te Puke East	Ret	550	570	600	630	590
Te Puke East	Svs	830	960	1,060	1,120	1,120
Te Puke East	Ed	240	240	240	250	250
Maketu Community	Ag	20	20	20	20	20
Maketu Community	Ind	60	60	60	60	60
Maketu Community	Ret	30	40	40	40	40
Maketu Community	Svs	50	50	50	60	60
Maketu Community	Ed	20	20	30	30	30
Rangiuru	Ag	920	1,010	1,110	1,190	1,200
Rangiuru	Ind	910	1,020	1,140	1,320	1,370
Rangiuru	Ret	30	30	30	30	30
Rangiuru	Svs	650	760	870	970	980




Area Unit	Smart Growth Sector	2020	2030	2040	2050	2060
Rangioru	Ed	30	40	40	40	40
Pongakawa	Ag	750	800	840	870	870
Pongakawa	Ind	110	110	130	130	140
Pongakawa	Ret	30	30	40	40	40
Pongakawa	Svs	120	140	150	170	170
Pongakawa	Ed	40	40	40	40	40
Paengaroa	Ag	170	210	230	250	250
Paengaroa	Ind	280	300	310	310	310
Paengaroa	Ret	40	40	50	50	50
Paengaroa	Svs	40	50	60	60	60
Paengaroa	Ed	20	20	20	20	20
Matua	Ag	-	-	-	-	-
Matua	Ind	180	180	180	190	210
Matua	Ret	40	40	40	50	50
Matua	Svs	450	540	650	770	780
Matua	Ed	60	70	70	80	80
Otumoetai North	Ag	-	-	-	-	-
Otumoetai North	Ind	200	220	230	240	250
Otumoetai North	Ret	130	140	150	170	180
Otumoetai North	Svs	370	440	530	600	620
Otumoetai North	Ed	100	100	110	120	120
Otumoetai South	Ag	10	10	10	10	10
Otumoetai South	Ind	180	190	180	190	210
Otumoetai South	Ret	50	50	50	50	50
Otumoetai South	Svs	190	230	280	320	330
Otumoetai South	Ed	80	80	90	100	100
Bellevue	Ag	80	80	90	100	100
Bellevue	Ind	90	90	90	90	100
Bellevue	Ret	10	10	10	10	10
Bellevue	Svs	270	330	410	490	510
Bellevue	Ed	380	410	430	460	460
Brookfield	Ag	10	20	20	20	20
Brookfield	Ind	170	170	160	170	190
Brookfield	Ret	360	390	410	430	430
Brookfield	Svs	230	270	330	390	400
Brookfield	Ed	100	100	110	110	110
Te Reti	Ag	20	20	20	20	20
Te Reti	Ind	50	50	50	50	60
Te Reti	Ret	10	10	10	10	10
Te Reti	Svs	180	220	260	310	310
Te Reti	Ed	-	-	-	-	-
Judea	Ag	40	50	50	50	50
Judea	Ind	960	990	1,000	1,010	1,030
Judea	Ret	170	170	170	170	170
Judea	Svs	410	460	530	590	590
Judea	Ed	30	30	30	30	40
Sulphur Point	Ag	-	-	-	-	-
Sulphur Point	Ind	920	930	970	980	980
Sulphur Point	Ret	200	200	210	210	220



Area Unit	Smart Growth Sector	2020	2030	2040	2050	2060
Sulphur Point	Svs	550	600	650	690	710
Sulphur Point	Ed	40	40	50	50	50
Tauranga Central	Ag	140	140	150	150	150
Tauranga Central	Ind	1,400	1,430	1,500	1,500	1,490
Tauranga Central	Ret	2,810	3,010	3,250	3,460	3,340
Tauranga Central	Svs	9,560	10,560	11,660	12,740	12,830
Tauranga Central	Ed	410	510	680	860	860
Tauranga Hospital	Ag	-	-	-	-	-
Tauranga Hospital	Ind	490	510	520	520	520
Tauranga Hospital	Ret	290	300	310	320	320
Tauranga Hospital	Svs	3,360	4,010	4,850	5,610	5,590
Tauranga Hospital	Ed	100	110	110	110	110
Tauranga South	Ag	110	110	120	120	130
Tauranga South	Ind	640	690	760	770	790
Tauranga South	Ret	760	830	840	860	860
Tauranga South	Svs	1,510	1,770	2,090	2,390	2,440
Tauranga South	Ed	840	870	920	980	970
Gate Pa	Ag	120	130	140	140	150
Gate Pa	Ind	140	150	150	150	160
Gate Pa	Ret	540	600	670	750	810
Gate Pa	Svs	280	320	370	420	450
Gate Pa	Ed	-	10	10	10	10
Yatton Park	Ag	30	30	40	40	40
Yatton Park	Ind	170	210	270	270	280
Yatton Park	Ret	20	20	20	20	20
Yatton Park	Svs	60	70	90	110	110
Yatton Park	Ed	40	40	50	60	60
Inlet-Tauranga Harbour	Ag	20	20	20	20	20
Inlet-Tauranga Harbour	Ind	10	10	10	10	10
Inlet-Tauranga Harbour	Ret	30	30	30	40	40
Inlet-Tauranga Harbour	Svs	-	-	-	-	-
Inlet-Tauranga Harbour	Ed	-	-	-	-	-
Greerton	Ag	210	220	230	240	250
Greerton	Ind	2,200	2,300	2,290	2,300	2,320
Greerton	Ret	550	560	570	570	570
Greerton	Svs	1,150	1,220	1,300	1,380	1,390
Greerton	Ed	300	320	350	370	380
Hairini	Ag	40	40	50	50	50
Hairini	Ind	180	190	180	190	210
Hairini	Ret	50	50	60	60	60
Hairini	Svs	290	340	410	480	490
Hairini	Ed	30	30	40	40	40
Poike	Ag	10	10	10	10	10
Poike	Ind	180	170	150	160	190
Poike	Ret	-	-	-	-	-
Poike	Svs	60	70	90	110	110
Poike	Ed	50	70	100	140	140
Maungatapu	Ag	90	100	100	100	110
Maungatapu	Ind	180	190	170	180	200



Area Unit	Smart Growth Sector	2020	2030	2040	2050	2060
Maungatapu	Ret	40	50	50	60	60
Maungatapu	Svs	110	130	160	180	190
Maungatapu	Ed	90	100	110	120	120
Kaitemako	Ag	20	20	20	20	20
Kaitemako	Ind	40	40	40	40	50
Kaitemako	Ret	10	10	10	10	10
Kaitemako	Svs	90	110	130	160	160
Kaitemako	Ed	20	20	30	30	30
Welcome Bay West	Ag	250	270	290	310	310
Welcome Bay West	Ind	100	110	110	120	130
Welcome Bay West	Ret	10	10	10	10	10
Welcome Bay West	Svs	60	70	90	110	110
Welcome Bay West	Ed	70	80	90	90	90
Welcome Bay East	Ag	160	180	200	210	220
Welcome Bay East	Ind	140	140	140	150	170
Welcome Bay East	Ret	40	40	50	50	50
Welcome Bay East	Svs	260	300	370	440	450
Welcome Bay East	Ed	100	100	110	110	110
Omanu	Ag	20	20	30	30	30
Omanu	Ind	6,710	6,760	6,950	6,970	7,010
Omanu	Ret	1,180	1,190	1,210	1,240	1,240
Omanu	Svs	2,990	3,150	3,290	3,380	3,390
Omanu	Ed	460	480	510	530	530
Tauranga City-Marinas	Ag	-	-	-	-	-
Tauranga City-Marinas	Ind	-	-	-	-	-
Tauranga City-Marinas	Ret	10	10	10	10	10
Tauranga City-Marinas	Svs	10	10	10	10	10
Tauranga City-Marinas	Ed	-	-	-	-	-
Bethlehem	Ag	140	200	230	250	260
Bethlehem	Ind	2,050	3,420	4,180	4,590	4,620
Bethlehem	Ret	650	850	1,010	1,150	1,030
Bethlehem	Svs	990	1,440	1,600	1,760	1,770
Bethlehem	Ed	660	800	900	960	950
Bethlehem East	Ag	200	210	220	230	230
Bethlehem East	Ind	130	130	130	140	150
Bethlehem East	Ret	30	30	30	30	30
Bethlehem East	Svs	190	230	270	320	330
Bethlehem East	Ed	10	10	10	10	10
Pyes Pa	Ag	460	510	550	590	600
Pyes Pa	Ind	410	410	400	420	460
Pyes Pa	Ret	120	130	140	160	160
Pyes Pa	Svs	760	910	1,120	1,330	1,350
Pyes Pa	Ed	210	250	320	340	340
Mt Maunganui North	Ag	30	30	30	40	40
Mt Maunganui North	Ind	1,100	1,170	1,260	1,270	1,290
Mt Maunganui North	Ret	1,240	1,350	1,450	1,470	1,480
Mt Maunganui North	Svs	1,390	1,680	1,890	1,940	1,950
Mt Maunganui North	Ed	40	40	50	50	50
Arataki	Ag	40	50	50	50	50



Area Unit	Smart Growth Sector	2020	2030	2040	2050	2060
Arataki	Ind	440	470	460	480	490
Arataki	Ret	1,250	1,450	1,690	1,910	1,740
Arataki	Svs	1,100	1,330	1,610	1,830	1,860
Arataki	Ed	110	130	140	160	160
Te Maunga	Ag	70	70	80	110	120
Te Maunga	Ind	510	540	590	1,940	2,150
Te Maunga	Ret	100	100	110	160	160
Te Maunga	Svs	310	370	450	840	910
Te Maunga	Ed	70	70	80	160	180
Palm Beach	Ag	10	10	10	20	20
Palm Beach	Ind	160	170	170	180	200
Palm Beach	Ret	430	480	520	550	580
Palm Beach	Svs	190	220	270	320	340
Palm Beach	Ed	120	120	130	140	140
Papamoa Beach East	Ag	10	10	10	10	10
Papamoa Beach East	Ind	110	120	120	120	130
Papamoa Beach East	Ret	40	50	50	50	60
Papamoa Beach East	Svs	210	240	280	330	340
Papamoa Beach East	Ed	40	40	40	40	40
Palm Springs	Ag	10	20	30	30	30
Palm Springs	Ind	410	1,030	1,050	1,130	1,320
Palm Springs	Ret	130	340	590	790	810
Palm Springs	Svs	240	520	840	1,000	1,040
Palm Springs	Ed	90	200	260	310	330
Pacific View	Ag	10	10	20	20	20
Pacific View	Ind	110	110	110	120	130
Pacific View	Ret	50	50	60	70	70
Pacific View	Svs	150	180	220	260	270
Pacific View	Ed	-	-	-	-	-
Gravatt	Ag	440	460	490	510	530
Gravatt	Ind	120	120	120	120	130
Gravatt	Ret	400	410	420	430	430
Gravatt	Svs	350	400	470	550	570
Gravatt	Ed	-	-	10	10	10
Matapihi	Ag	30	40	40	40	50
Matapihi	Ind	60	60	60	70	70
Matapihi	Ret	-	-	-	-	-
Matapihi	Svs	30	40	50	60	60
Matapihi	Ed	20	20	20	20	20
Kairua	Ag	20	30	30	30	30
Kairua	Ind	40	40	40	50	60
Kairua	Ret	-	-	-	-	-
Kairua	Svs	120	140	180	230	240
Kairua	Ed	50	50	60	60	60
Doncaster	Ag	190	210	220	230	240
Doncaster	Ind	60	70	60	70	80
Doncaster	Ret	60	60	60	70	60
Doncaster	Svs	140	160	200	240	240
Doncaster	Ed	260	260	270	280	280



Key:

Ag Agriculture

Ind Industry

Ret Retail

Svs Services

Ed Education