2014 Review of Demographic, Households and Labour Force Projections for the Future Proof Sub-Region for the Period 2013 - 2063

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Executive Summary

Preamble

1. This Report updates the previous projections for the Future Proof sub-region of the Waikato Region (Cameron, Cochrane and Poot, 2008) and includes detailed projections for three Territorial Local Authority (TA) areas: the Waikato District, Hamilton City, and the Waipa District, for the period 2013-2063.
2. The Report and its findings respond to a proposal brief and previous communications with Gary Knighton and Ken Tremaine on behalf of the Future Proof sub-region, with researchers at the National Institute of Demographic and Economic Analysis at the University of Waikato (NIDEA), subsequently followed by further consultation with Future Proof sub region partners by Dr Michael Cameron.
3. The Report covers Usually Resident Population projections by five-year age group and sex, Household and Dwelling projections by Household/Family type, Labour Force projections by broad age group and sex, and Private Motor Vehicle projections.
4. The population projections are based on the cohort component method of projection and provide high, medium and low variants. The Household/Dwelling projections are based on the medium variant only. The Labour Force and Private Motor Vehicle projections are based on the three projection scenarios.
5. The Report concludes with a commentary on key trends and determinants that are likely to influence the projections over the projection period. The commentary necessarily draws on SNZ's 2006-base subnational projections to contextualise the Future Proof sub region's trends.

Baseline Projections and comparison with SNZ projections and 2006-base projections

6. The medium variant baseline projections for the Waikato District indicate a population of around 82,733 in 2033 (+27.5 per cent over 2013-2033), and 94,862 in 2063 (+46.1 per cent over 2013-2063). For Hamilton City projected numbers are 190,744 in 2033 (+29.5 per cent), and 221,390 in 2063 (+50.1 per cent). For Waipa District, numbers grow to around 55,384 in 2033 (+19.4 per cent), and then decline to 51,758 by 2063 (+11.5 per cent over the entire 2013-2063 period; -6.5 per cent over 2033-2063).
7. The baseline projections for the Waikato District and Hamilton City are entirely consistent with those developed by SNZ to 2031. In each case they are lower than the high variant and slightly higher than the medium variant. The baseline projections for the Waipa District are almost identical to SNZ's medium variant until 2021, following which numbers deviate towards the higher variant until 2041 then gradually decline.

8. For the Waikato District there is a considerable difference between the 2006-base projections and new baseline projections, driven primarily by boundary changes which meant that the 2006-base projections came off a much lower base, and in part by greater growth between 2006 and 2013 than had occurred between 1991 and 2006; however there is minimal change to the projected growth trajectory. For Hamilton City, growth between 2006 and 2013 was slower than had occurred between 1991 and 2006; however the city's relatively youthful population also somewhat offset this, and it is not until 2031 that the two projections begin to deviate significantly. The 2013-base projections for the Waipa District deviates significantly from the 2006-base projections from its outset, primarily because of substantially slower than projected growth across the period 2006-2013 coupled with the impact of an increasingly older age structure—the latter slowing growth more than anticipated.

Waikato District

9. The population of the Waikato District is projected to grow from 64,910 in 2013 to around 82,733 in 2033 (+27.5 per cent) and to 94,862 in 2063 (+46.1 per cent); the greater portion of the growth occurring prior to 2040. The high variant projections produce a 2033 population of 94,634 (+45.8 per cent), and the low projections, 72,446 (+11.6 per cent). By 2063 the high projections would result in a population of 136,933 and the low projections, 66,168.
10. The following information summarises the medium variant projections only. Net migration is projected to remain positive across the entire projection period, averaging 351 per annum between 2013 and 2033, and 219 per annum between 2034 and 2063. There is a diminishing of natural growth from 2025, although this component will remain positive out to 2063.
11. Sitting behind the slowing of growth is the structural ageing of the population. By 2033 over 22 per cent of the Waikato District's population is projected to be aged 65+ years, up from 12 per cent in 2013; the proportion reaching 29.5 per cent by 2063. The ratio of those aged 65+ years to those aged 0-14 years is projected to increase from 52 elderly per 100 children in 2013 to 187 elderly per 100 children by 2063. The cross-over to more elderly than children will occur around 2033.
12. These trends will see growth at 65+ years account for 58.5 per cent of all growth in the Waikato District between 2013 and 2033. Those aged 0-14 years will contribute 0.8 per cent growth, those aged 15-39 years, 8 per cent, and those aged 40-64 years, 32.7 per cent. Between 2033 and 2063, numbers at both 0-14 years and 15-39 years will decline, while growth at 40-64 years and 65+ years will fully offset that decline. Particularly notable is the contribution to growth at 85+ years, numbers increasing by 577 between 2013 and 2033, and 1,874 between 2034 and 2063, accounting for 15.5 per cent of growth in the latter period.

Hamilton City

13. The population of Hamilton City is projected to grow from 147,290 in 2013 to 190,744 in 2033 (+29.5 per cent), and to 221,390 in 2063 (+50.3 per cent). As is the case for the Waikato District, the majority of growth occurs prior to 2033. The high variant projections produce a 2033 population of 213,144 (+44.7 per cent), and the low projections, 170,895 (+16.0 per cent). By 2063 the high projections would result in a population of 294,270, and the low projections, 166,778. The following information summarises the medium variant projections only.
14. Again the slowing of growth reflects the structural ageing of the population, with natural decline (more deaths than births) beginning around 2059. Net migration is projected to remain positive at all observations, but declines across the period, averaging 758 per annum between 2013 and 2033, and 574 per annum between 2034 and 2063.
15. By 2033, 21.4 per cent of Hamilton City's population is projected to be aged 65+ years, up from 11.3 per cent in 2013. By 2063 that proportion is projected to reach 33 per cent. The ratio of those aged 65+ years to those aged 0-14 years is projected to increase from 53 elderly per 100 children in 2013 to 258 elderly per 100 children by 2063 - Hamilton City ageing faster than the Waikato District.
16. Between 2013 and 2033, numbers aged 0-14 years are projected to decline by 1,029, and numbers aged 65+ years to increase by 24,106. However, it is the period 2033 to 2063 where the contribution to growth at 65+ years is most significant, offsetting decline at both 0-14 and 15-39 years. The contribution to growth at 40-64 years is positive across both periods but declines from 46.1 per cent (2013 to 2033) to just 11 per cent (2034-2063), whilst at 65+ years the contribution doubles.

Waipa District

17. The population of the Waipa District is projected to grow from 46,400 in 2013 to around 55,384 in 2033 (+19.4 per cent), and to then decline to 51,758 by 2063 (+11.5 per cent over 2013-2063; -6.5 per cent over 2033-2063). The high variant projections produce a 2033 population of 63,346 (+36.5 per cent), and the low projections, 48,513 (+4.7 per cent). By 2063 the high projections would result in a population of 71,346, and the low projections, 37,535. The following information summarises the medium variant projections only.
18. Again the slowing of growth, and, in Waipa's case, the onset of depopulation, reflects the shift from natural increase to natural decline around 2039. Net migration is projected to average 297 per annum between 2013 and 2033 and 93 per annum between 2034 and 2063. However the trend is far from linear, with a peak in 2024 at around 353 persons, followed by steady decline and even negative migration briefly around 2050; then a resurgence.
19. By 2033 one-third of the Waipa District's population is projected to be aged 65+ years, up from 16.9 per cent in 2013. By 2063 that proportion is projected to reach around 42.7 per cent. The

ratio of those aged 65+ years to those aged 0-14 years is projected to increase from 81 elderly per 100 children in 2013 to 366 elderly per 100 children by 2063 - Waipa District ageing much more rapidly than either the Waikato District or Hamilton City.

20. Between 2013 and 2033, growth at 65+ years offsets decline at 0-14 and 15-39 years, but is insufficient to do so across the period 2033-2063, resulting in the overall negative growth. Differing from both the Waikato District and Hamilton City, the majority of the growth at 65+ years occurs in the earlier part of projection period. Also contrasting with the Waikato District and Hamilton City, the contribution to growth at 85+ years is considerably greater for Waipa - albeit actual numbers are somewhat lower.

Population Share – Future Proof Sub-Region

21. Over the total projection period (2013-2063) there will be a small shift in each TA's share of the Future Proof sub-region's population, with Hamilton City projected to increase its share from 57 per cent in 2013 to 60.2 per cent in 2063 (+3.2 per cent). Also gaining very slightly in population share will be the Waikato District, increasing from 25.1 to 25.8 per cent (+0.7 per cent). By contrast, the Waipa District is likely to see a small reduction in share, from 17.9 per cent in 2013 to 14.1 per cent in 2063 (16.8 per cent share in 2033).

Household Projections

22. Household projections are provided for the medium variant projection only. Taking the Future Proof sub-region as a whole, all categories of households and families are projected to experience positive growth during the overall projection period to 2063 (76 per cent growth in household numbers). Strong growth is projected in couple-without-children families (+110 per cent) and one-person households (around 150 per cent). Considerably weaker growth is projected for two-parent families (+7 per cent), which peak in number in 2038 at around 30,022 families. Modest growth (+15 per cent) is projected for other multi-person households, which reach peak numbers around 2043 at 5,558 households.
23. For the Waikato District total household numbers increase throughout the projection period, growing by close to 80 percent. Couple-without-children (+110 per cent) and one-person households (+140 per cent) are projected to grow strongly throughout the period to 2063. Projected growth is modest in two-parent families (+15 percent) and other multi-person households (around 40 percent) with projected peak numbers of two-parent families reached in 2043 (8,676 families). Other multi-person households peak late in the period (2058) at 840 households.
24. For Hamilton City, total household numbers are projected to grow by around 90 percent. Strong growth is projected in couple-without-children families (close to 130 percent) and one-person households (170 percent). Modest growth is seen in the numbers of two-parent families (+15

per cent), which peak in 2053 at 16,888 families, and in other multi-person households (+13 per cent), peaking at 4,223 households in 2043.

25. While overall growth in household numbers to 2063 is positive for the Waipa District (+38 per cent over 2013-2063), numbers peak in 2043 at 26,398 households and then decline. Couple-without-children families are projected to grow by 66 percent 2013-2063 with projected peak reached around 2043 (11,086 families), while two-parent families decline in number across the projection period by approximately 25 percent. One-person households increase markedly in number 2013-2063 (+90 percent), however, peak numbers are projected to be reached in 2048 at 8,419 households, with decline thereafter.

Labour Force Projections

26. Labour force projections for the period 2013-2063 are conducted under four scenarios. Only those projected under the medium variant are reported here. Scenario One is a business as usual projection (2013 labour force participation rates forever), Scenario Two attempts to capture the impact of an increase in female labour force participation, Scenario Three aims to examine the effects of rising labour force participation rates amongst older residents while Scenario Four combines Scenarios Two and Three.
27. Taking the Future Proof sub-region as a whole the projected labour force grows under all four scenarios by between 29.5 percent (Scenario One) and 51.9 percent (Scenario Two).
28. Projected labour force growth peaks in 2053 under Scenarios One (182,056) and Two (195,717), and in 2058 under Scenarios Three (203,166) and Four (211,432), before declining in the latter period. These declines do not, however, offset the earlier increases.
29. For the Waikato District all four scenarios project positive growth in the labour force between 2013 and 2063 (between 40 and 65 percent) with this growth being continuous but slowing under Scenarios Two, Three and Four, while under Scenario One the labour force is projected to peak in 2058 (at 48,809).
30. Between 2013 and 2063 Hamilton City's labour force is projected to grow by between 35.1 percent (Scenario One) and 58.1 percent (Scenario Four). Under Scenario One Hamilton City's labour force is projected to peak in 2053 (107,094). Under Scenario Two the peak is also projected to occur in 2053 (115,905), while under Scenarios Three (119,954) and Four (124,589) this peak occurs in 2058.
31. Under Scenario One the Waipa District is projected to experience a decline in its labour force of 3 or more percent over the period 2013-2063, with the peak labour force being reached around 2028 (28,120). The overall projected gain in the Waipa District's labour force 2013-2063 (2,841) more than offsets the decline in the later projection period (2033-2063).

Motor Vehicle Projections

32. For the Waikato District, private motor vehicle numbers under both the medium and high variant projections are expected to increase out to 2063. Under the medium series, the number of motor vehicles is projected to increase from 39,556 in 2013 to 58,078 by 2033 (+46.8 per cent) and to 66,593 by the end of the projection period, while the low variant projections indicate a decline in vehicle numbers from 45,339 in 2037 to 41,261 by 2063.
33. A similar trend is reflected for Hamilton City with both the medium and high series projections indicating an increase in motor vehicle numbers over the whole projection period. The medium series projections indicate growth of around 49.2 per cent (an additional 44,144 motor vehicles) over the 2013-2033 period. In the latter projection period, growth begins to slow for both the high and medium series projections, while the low series projections indicate negative growth from the late 2040s (-2.3 per cent).
34. For the Waipa District, the medium and low series projections indicate an initial increase in vehicle numbers across the projection period 2013-2033, but move into decline during the later projection period, 2034-2063. The medium series projections indicate an increase of 37.5 percent in the number of motor vehicles across the projection period 2013-2033. Growth slows and declines across the second part of the period (-6.5 per cent) although not enough to offset the earlier growth, indicating an increase of +28.5 per cent for whole projection period, 2013-2063. Under the low series projections, the number of vehicles is expected to decline quite considerably over the projection period 2013-2063, from 27,840 to 23,407 (-15.9 per cent) with negative growth likely to begin around 2033.

1. Introduction

The Future Proof Growth Management Strategy was adopted in 2009 following its development by a coalition of four partner councils: the Waikato Regional Council, Hamilton City Council, Waipa District Council and Waikato District Council. Tāngata Whenua representatives, the New Zealand Transport Agency, and Matamata-Piako District Council have also been closely involved in the development of the Strategy.

Future Proof set the following broad objectives for this project:

- The projections will focus on the Future Proof sub-region and will be used for both strategic and district / city level planning for land use, facilities and infrastructure.
- The demographic and labour force projections will draw from the same base assumptions. Economic influences on net migration will be recognised and detailed.
- The projections will factor in the influence of Auckland on the Future Proof sub-region and will include the new territorial area of the Waikato District and the Waikato Region as a result of the Auckland boundary changes in 2010.
- The projections will incorporate an inter-regional picture of the Bay of Plenty and Waikato regions by using consistent methodology and assumptions.
- The projections for the territorial authorities will be able to be applied by the councils spatially, so that growth at area unit, sub-unit (area defined by meshblocks based on growth type) and mesh-block level can be allocated. The Future Proof partner Councils will do their own area unit allocations.
- The labour force projections will be suitable for assessment of general business land forecasts for both retail and non-retail activity that will assist land use and transportation planning.
- The projections will provide a better understanding of household formation rates in the sub-region, particularly given an ageing population. The work should identify future household formation rates and possible household composition in so far as it may affect the demand for future housing.
- The resulting report will include commentary on likely future structural economic shifts that may occur over the projection period, to enable the implications of changing economic conditions on population and employment patterns in the sub-region to be broadly understood.

This report outlines the results from these projections for the Future Proof sub-region comprising of the Waikato District Council, the Waipa District Council and the Hamilton City Council areas, and the related projection methodology and assumptions.

Background

Future Proof invited the National Institute of Demographic and Economic Analysis (NIDEA) at the University of Waikato to develop a revised set of demographic projections based on the 2013 Census for the Future Proof sub-region (comprising the Waikato District Council, the Waipa District Council and the Hamilton City Council areas).

NIDEA is a leader in demographically-based population projection methodologies. NIDEA undertook to deliver a final written report suitable for a public audience with other Future Proof material that covers the following items (detailed projections in annual increments for the period 2013 to 2033, and in five-year increments for the period 2033 to 2063):

- Detailed methodology on how the demographic, household, dwelling, motor vehicle and labour force projections have been produced, including details of the associated Stakeholder consultation;
- Usually Resident Population projections by age and sex, household composition, dwelling numbers, and private motor vehicles by three variants;
- Labour force projections in total by broad age group and sex, by three variants;
- A written commentary of key trends and determinants that are likely to influence the projections, including migration, over the projection period. Beyond 2063 a written commentary of key trends and determinants that will influence population change, including migration;
- A final, full projection set at TA level for demographic and labour force projections supplied in written report and tables format (web friendly) suitable for publication
- A presentation of the final projection set and their technical basis to the Future Proof Technical Implementation Group, Future Proof Chief Executives / Strategic Implementation Group and the Future Proof Implementation Committee
- Two workshops on growth drivers – one with the Future Proof partners and a second workshop involving both the Future Proof and SmartGrowth partners in order to identify common drivers.

- A presentation of the final projection set and their technical basis to the Future Proof Technical Implementation Group, Future Proof Chief Executives / Strategic Implementation Group and the Future Proof Implementation Committee.

NIDEA will meet most of Future Proof's objectives and required deliverables. However NIDEA cannot offer to undertake either employment or income projections as part of this project, because they require a significantly different economic modelling methodology. Instead NIDEA undertakes projections which can be modelled on the demographic projections, such as labour force participation, household composition, dwelling and motor vehicle numbers. NIDEA will provide general commentary on factors which may influence population change during the projection period, but for this project will not comment on population change beyond 2063.

One unique situation arising over the consultation period and having a significant impact on the project methodology requires special mention. In February 2011, just days before the 2011 Census was to be held, severe earthquakes shattered Christchurch City—the headquarters for the running of Statistics New Zealand's Census. The Census was subsequently postponed, and not run until March 2013. This delay has had a major impact on the development of the baseline population on which to develop the new projections, and would ordinarily have been provided directly by Statistics New Zealand (SNZ) in the form of the June 2013 Estimated Resident Population (ERP), based on the 2013 Census. Because these data will not be available until later in 2013, considerable deliberation was given to this issue, and the resulting rational for the choice—and development—of the baseline population is detailed in the methodology section.

Scope and Structure

The Waikato sub-region is comprised of three Territorial Local Authority (TA) areas: Waikato District, Hamilton City and Waipa District. Boundary changes to the Waikato District in 2010 after the creation of the Auckland Super City, and subsequent boundary changes with Hamilton City, are reflected in the projections. That is, all projections are based on 2013 boundaries.

The Report covers Usually Resident Population projections by five-year age groups and sex, Household and Dwelling projections, Labour Force projections by broad age group and sex, and projections of Private Motor Vehicle numbers.

The population projections begin with baseline projections which project a 'medium case' scenario drawing on past fertility, mortality and migration trends (1991-2013) that have been calibrated to take account of both fluctuations in these trends, expert judgement and stakeholder feedback. High and low projection variants are also developed and described further below.

The Household and Dwelling projections are based on the medium variant population projections, while the Labour Force and Motor Vehicle projections are based on all three (high, medium and low) variants. All projections are presented for the period 2013 to 2063; in annual increments for the period 2013 to 2033, and in five-year increments for the period 2033 to 2063. Where appropriate the data are presented by single year for the entire period.

The Report is structured as follows. This Introduction is preceded by an Executive Summary and followed by a detailed Methodology (Chapter 2). The projections are presented in three substantive chapters: Population Projections (Chapter 3), Household and Dwelling Projections (Chapter 4), Labour Force Projections (Chapter 5), and Motor Vehicles (Chapter 6). The projections are presented on a TA-by-TA basis. Each section includes brief commentary on why the trends are unfolding as indicated. Chapter 7 provides a brief commentary of key trends and determinants that may influence population change in New Zealand and the Waikato region beyond 2063.

To reduce what would be an extremely extensive appendix if all data (eg., by age and sex for all projected years) were included in this hard copy, all tables and graphs will be provided to Future Proof in Microsoft Excel format.

Project Team

The NIDEA project team is comprised of:

Professor Natalie Jackson
BSocSci MSocSci (Hons) Waikato, PhD Australian National University

Professor Natalie Jackson is a demographer with a high level of expertise in local government demography across New Zealand and Australia. Natalie contributed to the development of the projection assumptions, the analysis, its interpretation and the preparation and delivery of reports.

Dr. Michael P. Cameron
BMS (Hons) Waikato PhD Waikato

Dr Michael Cameron is an expert in population projection methodology and has been involved in many previous projects for territorial local authorities in New Zealand. Michael undertook the population projections.

Dr. Bill Cochrane
MSocSci Waikato PhD Waikato

Dr Bill Cochrane is highly experienced in consultancy projects providing population projection and labour market analysis services to government and non-government organisations. He contributed to the development of household and labour force projections, and the development of appropriate economic and social scenarios in the second stage of the project.

Dr. Veronique Gibbons
MSci London PhD Auckland

Veronique Gibbons is the Research Development Manager for NIDEA. Her expertise is in health research and project management. She managed the project and project team.

Two NIDEA Research Officers also contributed to the project:

Ms. Shefali Pawar and Dr. Alison Day

2. Methodology

Data Source

The underlying data used in the formulation of these projections was sourced from Statistics New Zealand (SNZ). This includes national and subnational data from the five-yearly Census of Population and Dwellings (1991, 1996, 2001, 2006, and 2013), national and subnational period life tables, national and subnational vital statistics data, the SNZ subnational population projections series, and the reported assumptions underlying those projections.

The Cohort Component Model

The most common methodology for population projections is the cohort component model. This is the methodology used by SNZ, who is the major supplier of data on current and projected population size, growth and structure for New Zealand regions and districts. This report follows the methodology of previous projection projects, including that for Future Proof in 2008 (e.g., Cameron et al. 2007; 2008a; 2008b) and Smart Growth in 2014 (Jackson et al., 2014).

Figure 1 describes the general approach that was used in developing these population projections. The current population (base population) is first defined, and then assumptions are made about demographic changes to this population, using the cohort component model. This is a stock-flow model that is based on the following fundamental "accounting identity" of population growth:

usually resident population in area *i* at the *end* of year *t*

= usually resident population in area *i* at the *beginning* of year *t*

+ births to mothers residing in area *i during* year *t*

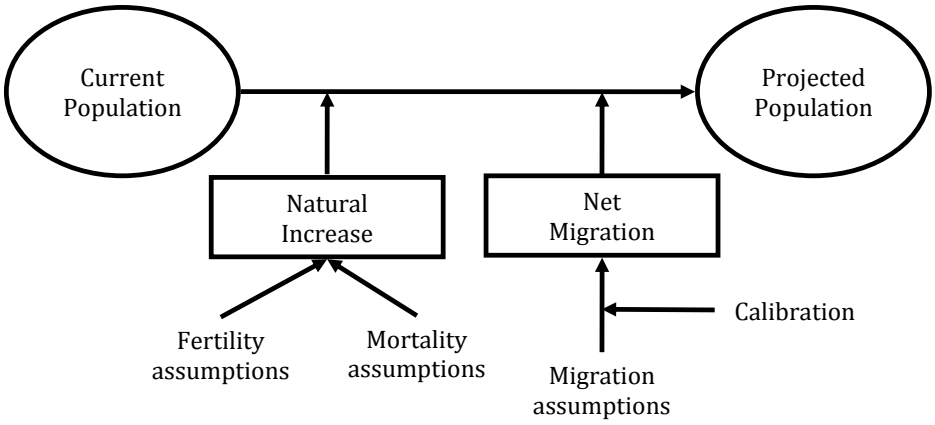
– deaths of residents of area *i* during year *t*

+ inward migration from other regions and from overseas into region *i* during year *t*

– outward migration of residents from area *i* to other regions or to overseas during year *t*

All components are projected by single year of age and sex.

Figure 2.1: The stakeholder-informed Cohort Component Model



Starting with a given base year population, the population twelve months later is then calculated using the above equation. This generates the base population for the following year. The procedure is repeated for each year through to the end of the projection period (the projection horizon), and separately for each sex. Separate assumptions are used for each of the demographic "drivers". Births are derived by multiplying age specific fertility rates by the numbers of women of childbearing age (13-49). Deaths are derived by multiplying age- and sex-specific mortality rates by the numbers of people of each age and sex.[1] Age- and sex-specific net migration is initially derived by multiplying age- and sex-specific net migration rates by the numbers of people of each age and sex. The procedure for deriving estimates of net migration is a key departure from the method employed by SNZ and involves calibration based on end-user information and additional local data, where available. The method for deriving these estimates is described in detail below.

Demographic change assumptions, when applied to the current population, allow the calculation of possible future populations. Such calculations are referred to as population *projections* rather than population *forecasts*, because they depend on sets of assumptions and no explicit assessment is made of the relative likelihood of the assumptions being correct in the future. Varying the assumptions across projections simply permits a sensitivity analysis that provides a relatively broad range of possible outcomes.

All assumptions applied in these projections are the same as the assumptions applied in the projections for the Bay of Plenty Smart Growth 2014 Revisions (Jackson et al., 2014).

[1] However, instead of mortality rates the current methodology employs sex- and age-specific survivorship rates, which are simply the complement of mortality rates.

Base Population

The base population used for the projections was the Estimated Resident Population (ERP) at 30 June 2013, obtained from SNZ. This estimated population is only reported by SNZ in 5-year age groups, so the single-year age groups necessary for the population projection model were derived by interpolating the Estimated Resident Population at 30 June for each territorial authority using the Census Usually Resident Population counts by single-year-of-age from the 2013 Census of Population and Dwellings. Separate interpolations were undertaken for each sex.

One important caveat with regard to the June 2013 ERP must be noted. Although the June 2013 ERP was released by SNZ shortly after the 2013 Census data began to be released in December, the June 2013 ERP remained 2006-based. To understand the rationale for this approach, it is important to understand that Usually Resident Population data are missing adjustments for census night undercount, and for people temporarily overseas on census night. Thus the ERP is the best available data for use as a base population. The following points, prepared by SNZ, describe the differences between each 'level' of data:

- **Census Night Population** counts, which count people where they were on census night and includes visitors from both overseas and elsewhere in New Zealand
- **Usually Resident Population** (URP) counts, which reassign visitors to their usual residence but do not yet include an adjustment for census night undercount or people temporarily overseas on census night, and
- **Estimated Resident Population** (ERP) counts, which include the adjustments for census night undercount and those temporarily overseas. The ERP also includes births, deaths and migration occurring between census night and the date of the subsequent ERP.

Following stakeholder consultation on draft projections, Hamilton City Council noted that the 2013 ERP base population (150,200) seemed unusually high relative to the Census Usually Resident Population (CURP). The final projections were re-based to use a lower base population, based on scaling up the 2013 CURP by the same proportion as the proportional difference between the 2006 ERP and CURP to generate a population of 147,290. No similar adjustment for Waikato or Waipa District base populations was deemed necessary, as the ratio of the 2013 ERP/CURP for those districts were proportionally similar to that of 2006.

Fertility and Mortality Assumptions

The fertility and mortality assumptions used in the projections were based on the subnational 'medium' fertility and mortality assumptions used by SNZ in their 2006-base population projections. Having considered alternative time series for fertility and mortality, we believe that the assumptions used by SNZ with respect to fertility and mortality in their subnational population projections are adequate for our purposes (see Cameron et al. 2008b). As SNZ uses past fertility and mortality (survivorship) rates based on the official deaths and births statistics to develop their projections, the SNZ assumptions represent an appropriate starting point.

Age-specific fertility rates by single-year-of-age (of the mother) were derived by first interpolating the five-year subnational age-specific fertility rate using the national-level age-specific fertility rate profile by single-year-of-age. The resulting profiles were then scaled to match the projected total fertility rate for each territorial authority. The total fertility rate for each territorial authority was assumed to follow the SNZ projections to 2031 then remain invariant after 2031. Sex at birth was assumed to follow a constant pattern similar to past trends, with 105.5 males for every 100 females at birth.

Age-specific survivorship rates by single-year-of-age and sex were derived by first interpolating the survivorship rates from the subnational abridged life tables for each territorial authority using the national life tables by single-year-of-age. The resulting profiles were then scaled to match the projected life expectancy at birth for each territorial authority. Life expectancy at birth for each territorial authority was assumed to follow the SNZ projections to 2031 then remain invariant after 2031.

Migration Assumptions

For subnational projections, the projection methodology employed by SNZ involves the estimation of net migration for each territorial authority in each year. SNZ prepare three projections, based on 'low', 'medium', and 'high' levels of net migration. The total net migration assumed by SNZ in their 2006-base population projections for each territorial authority in the Waikato region under each of these scenarios is presented in Table 2.1.

Table 2.1: Statistics NZ net migration estimates for selected Waikato Region TAs

		Net Migration (Five-year period ending 30 June)		
		'Low' series	'Medium' series	'High' series
Hamilton City	2006-2011	+1,900	+3,100	+4,400
	2011-2016	+00	+2,500	+5,000
	2016-2021	+00	+2,500	+5,000
	2021-2026	+00	+2,500	+5,000
	2026-2031	+00	+2,500	+5,000
Waikato District	2006-2011	+1,300	+1,800	+2,300
	2011-2016	+00	+1,000	+2,000
	2016-2021	+00	+1,000	+2,000
	2021-2026	+00	+1,000	+2,000
	2026-2031	+00	+1,000	+2,000
Waipa District	2006-2011	+700	+1,000	+1,400
	2011-2016	+00	+700	+1,400
	2016-2021	+00	+700	+1,400
	2021-2026	+00	+700	+1,400
	2026-2031	+00	+700	+1,400

Source: Statistics NZ, NZ.Stat: Subnational Projected Population Characteristics, 2006(base)-2031 (October 2012 update)

Importantly, SNZ base their projections of net migration on series of 'known' net migration. 'Known' net migration requires that the data specifies both the origin (within New Zealand or overseas) and destination (within New Zealand or overseas) of the migrant. Since not all migration is 'known', known net migration is systematically lower than estimated net migration.[2] Crucially, the impact of this is that areas with net in-migration will be systematically under-projected, while areas with net out-migration will be systematically over-projected, as demonstrated in Cameron and Poot (2011).

The SNZ methodology also requires the specification of an overall net migration profile by age and sex. This profile specifies the proportion of net migration that is assumed to occur among people of each age and sex, although the profile is allowed to change and therefore is also projected forward. In developing their net migration profile, SNZ uses census-based estimates of net migration as well as information provided by local authorities on proposed developments in their districts/cities that are likely to have an impact on population movement and change, and data from arrival and

[2] Estimated net migration is the difference between the net change in population (such as between Censuses), and natural increase (which is itself the difference between births and deaths). The composition of population change for the Waikato Region, including natural increase and the 'known' and 'unknown' proportions of estimated net migration, are outlined in Jackson et al. (2013).

departure cards on people leaving or entering the country for twelve months or more. The net migration profile is then used along with the projected total net migration of each territorial authority in deriving the projections.

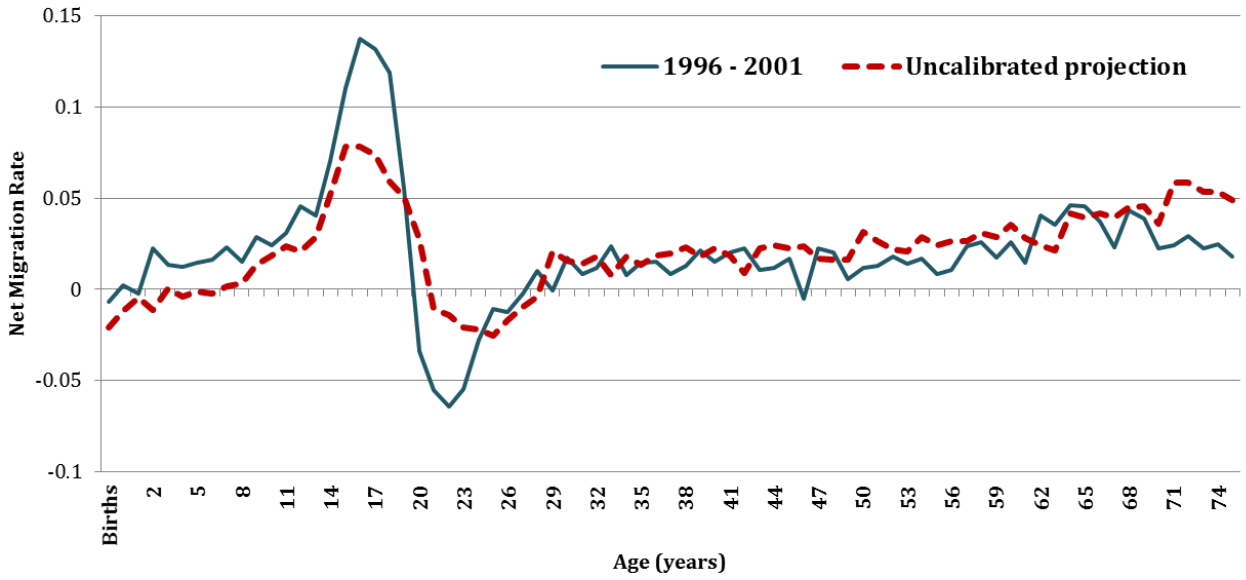
We adopt a substantially different methodology to that employed by SNZ. The key difference is that rather than estimating a single net migration figure and applying that figure to a net migration profile, we estimate sex- and age-specific net migration *rates* which are then applied to the actual profile of population in each territorial authority. These rates can then be applied in a similar way to fertility and survivorship rates in projecting the future population (see Cameron and Poot 2010; 2011).

The basic estimation of the net migration rates is as follows. First, we used SNZ data for the period 1991-2013 on Census night Usually Resident Population counts, reported sex-specific births, to estimate residual net inter-censal population change (excluding deaths). These ex-mortality residuals represent the inter-censal population change that is accounted for by mortality (deaths) and net migration, both of which can be estimated as population-level rates.

The ex-mortality residuals were converted to estimates of annual rates using log-log regression. This method explicitly recognises that each age-sex-specific population group will experience five (or seven) different age-sex-specific migration rates *exactly once* during each inter-censal period. To ensure that enough degrees of freedom were available for the estimation, and that the base populations were large enough for estimation, the population of each sex aged 75 and over was combined and only one rate was estimated for that group. Otherwise age-sex-specific rates were estimated for every sex at single-years-of-age.

The estimated rates represent the proportion of the population at the end of each year that had either died or migrated during the year. To convert these rates to net migration rates, age-specific mortality rates obtained from the national-level life tables were applied to them, to remove the effect of mortality. As an illustration, Figure 2.2 presents the net migration rate profile for Hamilton City females for the 1996-2001 inter-censal period, and the corresponding uncalibrated projection of the net migration profile. Indicative net migration profiles for each TA are provided at Appendix A. Appendices A1-A6 show single year of age profiles by sex for the period 1996-2001; Appendix A7 provides a comparative overview for the three census periods 1996-2001, 2001-2006 and 2008-2013, male and female data combined, by 5-year age group. The consistency of the age profiles over time should be noted.

Figure 2.2: Net and projected migration profiles for Hamilton City females, 1996-2001



This procedure resulted in a series of four inter-censal (but annualised) net migration rates for each sex- and age-specific population group, which were projected forward to 2061, using simple exponential smoothing.[3] Net migration is then projected by multiplying the age-sex-specific net migration rate by the age-sex-specific population at the beginning of each year.

Under this method, projected net migration reflects a combination of the assumed net migration rates which vary over time, and the age-sex structure of the territorial-authority-level populations which also vary over time.

Validation and Calibration

The final stage of developing population projections is validation and calibration. Validation involves running the projections model to ensure that it is behaving as expected, with base populations, fertility, survivorship and net migration assumptions being correctly applied. This step is usually straightforward.

Calibration is necessary in models using net migration rates because of the possibility that rates cause the projected population to diverge substantially from past trends. This is particularly an issue for these projections, where the net migration projection is based on only four inter-censal periods. Calibration involves modifying the net migration profile to more closely match either past population data trends, or expected future trends. It is at this stage that end-user input is useful, in helping to determine the appropriate calibration of the model.

[3] For the exponential smoothing, α was set equal to 0.1.

For the current projections a weighted average of the population growth rate between 1991 and 2013, and the population growth rate between 2006 and 2013, was used as an initial calibration guide. The weighted average that was applied was based on the mean weighted average applied in population projections developed for SmartGrowth for the Bay of Plenty region (Jackson et al., 2014). This ensures that these interim projections are aligned with the final projections developed for the Bay of Plenty region.

The process of calibration was undertaken using a combination of expert judgement and stakeholder engagement. An interim set of projections was first developed, calibrating based on a weighted average of the population growth rate between 1991 and 2013, and the population growth rate between 2006 and 2013. The weighted average that was applied was based on the mean weighted average applied in population projections developed for SmartGrowth for the Bay of Plenty region (Jackson et al., 2014), thereby ensuring alignment between the projections for the Bay of Plenty and Waikato regions. Then, a survey was undertaken among key stakeholders at several end-user workshops, where stakeholders were asked for each TA:

> *Considering what you know about past trends and what you expect about future trends in each of the following territorial authority areas in the Waikato region, which period would you expect future population growth (between now and 2031) in that area to be most like?*

The options presented were each of the four previous inter-censal periods (i.e. 1991-1996, 1996-2001, 2001-2006, and 2006-2013). In total, fifteen responses were received to the survey, some during an end-user workshop, and some via email before the workshop. Not all respondents provided information for all of the TAs. The results of the survey are summarised in Table 2.1 below. The final calibration was based on a Bayesian inference approach, where the 'prior' calibration was the expert judgement from the interim projections. This prior calibration was then refined by incorporating the views of the stakeholders, who overwhelmingly felt the calibration should be more heavily weighted to the more recent periods. In combination with expert judgement this step obtained the posterior calibration (see bottom of Table 2.1), which results in a fairly similar calibration to that obtained for SmartGrowth (Jackson et al., 2014).

Table 2.2: Calibration for the final projections

Prior Distribution (Original Calibration)			
	Waikato District	**Hamilton City**	**Waipa District**
1991-1996	0.036	0.036	0.036
1996-2001	0.034	0.034	0.034
2001-2006	0.095	0.095	0.095
2006-2013	0.835	0.835	0.835
Survey Results			
	Waikato District	**Hamilton City**	**Waipa District**
1991-1996	0	0	0
1996-2001	0	0	0
2001-2006	0	0.143	0.167
2006-2013	1	0.857	0.833
Posterior Distribution			
	Waikato District	**Hamilton City**	**Waipa District**
1991-1996	0.018	0.018	0.018
1996-2001	0.017	0.017	0.017
2001-2006	0.047	0.057	0.059
2006-2013	0.918	0.908	0.906

High and Low Projection Assumptions

In addition to the baseline (medium) projections outlined above, we present high and low population projections which are based on alternative sets of assumptions. Following Cameron and Poot (2010; 2011), each age- and gender-specific rate (fertility, mortality/survivorship, and net migration) was multiplied by a shift factor. The percentage change in each of the rates is given by k, whereby k is based on a distribution for fertility, mortality/survivorship and migration. The entire deterministic path of fertility, mortality and net migration rates over the 2006-2031 projection period was shifted by the corresponding factors. In this way, if all multipliers were set to zero this would result in the baseline projection and the multiplier is varied around zero to increase or decrease each rate.

Following Cameron and Poot (2010; 2011), distributional assumptions for each multiplier were based on observed data from 1950 to 2009. The fertility multiplier was assumed normally distributed with a mean zero and standard deviation of 1.25 (giving a range of about +/- 5% of the mean fertility rates). The survivorship multiplier was assumed normally distributed with mean

zero and a standard deviation of 0.5 (i.e. giving a range of +/- 2% of the mean mortality rates). The net migration multiplier was assumed normally distributed with mean zero and a standard deviation of 12.5 (i.e. giving a range of +/- 50% of the mean net migration rates. In all cases, the assumed variability is similar or somewhat less than that observed over the periods since 1950 and since 1991.

When applied stochastically, these shift factors can be used to generate stochastic population projections. However, in this case the shift factors were used to generate only high and low population projections. The high projections assumed 1.5 standard deviations higher fertility, mortality and net migration, while the low projections assumed 1.5 standard deviations lower fertility, mortality and net migration. These represent plausible alternative scenarios to the baseline (medium) population projection scenario.

Household and Dwelling Projection Assumptions

The Household and Dwelling projections were derived from the baseline medium variant population projections by employing additional assumptions projections regarding the rates of people living in different living arrangements (e.g. couples without children, couples with children, etc.), the average number of families per household, and the average number of people per multi-person household (see Cameron et al. 2007). The numbers of households are then derived from the number of people in each living arrangement type. The projection assumptions were informed by data from the 2001, 2006 and 2013 Censuses.

Labour Force Participation Assumptions

The Labour Force projections were obtained by applying age- and sex-specific assumptions about future trends in labour force participation rates (LFPR) to the projected high, medium and low populations (see Cameron et al. 2007).[4] Following Bryant et al. (2004), we initially assumed that age- and sex-specific participation rates by broad industry increase in a linear fashion to 2021 before stabilising. This initial assumption was varied following stakeholder engagement (see Chapter 5 for detailed scenarios).

Motor Vehicle Projection Assumptions

High, medium and low projections of total motor vehicles were based on the high, medium and low population projections, along with an additional assumption about motor vehicle ownership rates (the number of motor vehicles per capita). A projection of ownership rates would ordinarily rely on a set of interconnected assumptions related to economic growth, household incomes, oil prices, car

[4] The labour force participation rate is the proportion of the working age population who are either employed (part- or full-time) or unemployed and actively seeking work. The working age population is typically defined as either all those aged 15 and over, or all of those aged between 15 and 64 years inclusive.

prices, public transport policy and infrastructure, and so on. Instead of creating a complex model that was beyond the scope of this project, we relied on motor vehicle ownership rates projections developed by Conder (2009) for the New Zealand Transport Agency. The projected rates by Conder (2009) include high, medium and low projection scenarios.

To determine the projected number of motor vehicles, the population projection for each territorial authority was multiplied by the appropriate motor vehicle ownership rate (high, medium, low). In all cases, the ownership rates were assumed to remain invariant after 2031.

3. Population Projections - Results

This section begins with an overview of the medium variant projection output for each territorial authority to 2061, accompanied by comparison with existing SNZ high, medium and low projections to 2031, and also with the previous 2006-base Future Proof projections to 2061 developed in 2008 by Cameron et al. For the purposes of comparison, these graphs necessarily use the same 5-year periodicity followed by SNZ (i.e., 5 yearly observations beginning with 2006), but reference 2013 instead of 2011 to accommodate the beginning of the NIDEA 2013-base revisions. The remaining data in this Report follow the Future Proof period specifications (2013, 2018, 2023 etc.) which are based on the delayed *Census of Population and Dwellings* eventually run in 2013.

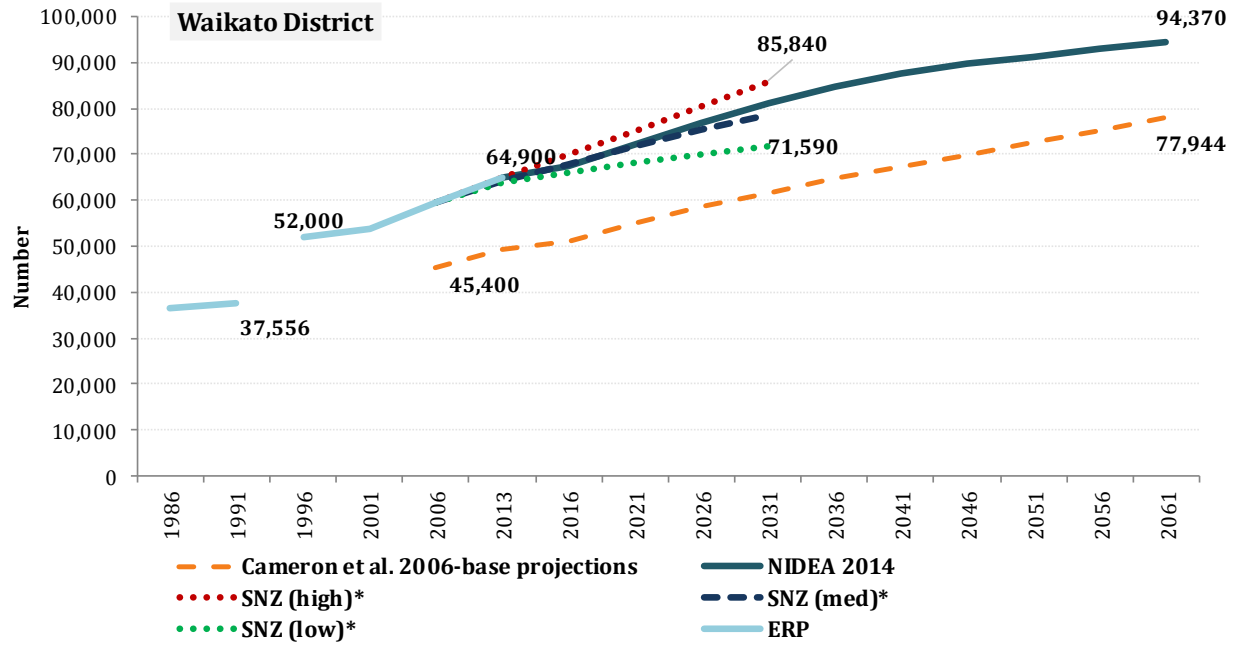
Reasons for differences between the 2006-base and revised 2013-base projections are outlined below. Also included on each graph is the Estimated Resident Population (ERP) data for the period 1986-2013. These data provide additional information as to why the revised projections differ from the 2006-base projections.

Figures 3.1 and 3.2 show that NIDEA's medium variant projections for the Waikato District and Hamilton City are entirely consistent with those developed by SNZ to 2031 (see Appendix B for data). In each case they are lower than the high variant and slightly higher than the medium variant. Numbers for both districts continue to increase after 2031 but at a slower rate.

For the Waikato District (Figure 3.3) there is a considerable difference between the 2006-base and 2013-base projections, driven in large part by the clearly visible boundary changes, which saw the 2006-base projections begin from a much lower population base. However the TA also experienced slightly greater population growth than assumed in the 2006-base projections. Between 1991 and 2006 the population of the Waikato District grew by an annualized average of 1.0 per cent (under the 2013 boundaries), while between 2006 and 2013 it grew by 1.2 per cent. Because population growth was higher for the Waikato District than its historical trend, the projected growth *pattern* does not change much between the revisions of the projections.

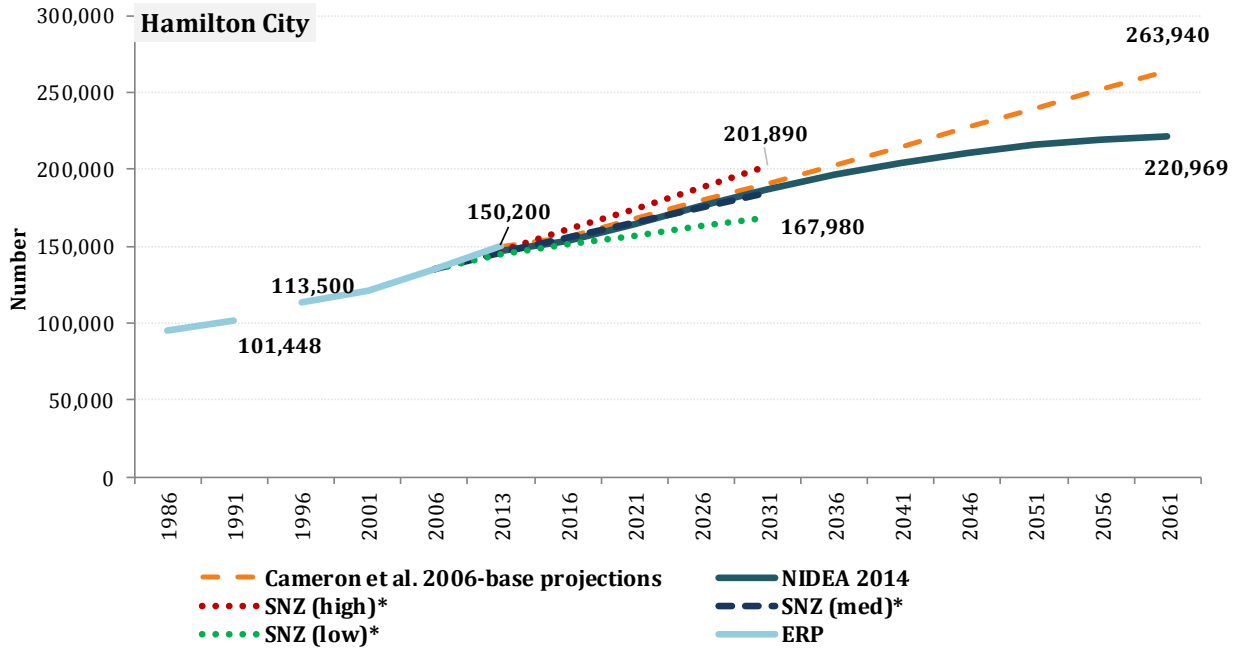
For Hamilton City, by contrast, annualized growth between 2006 and 2013 (1.3 per cent per annum) was slower than occurred between 1991 and 2006 (2.0 per cent per annum). The outcome is that between 2006 and 2013 Hamilton City grew more slowly than was projected by Cameron et al (2008); however the city's relatively youthful population also somewhat offset this, and it is not until 2031 that the two projections begin to deviate significantly.

Figure 3.1: Baseline projections for the Waikato District and comparison with the Cameron et al. 2006-base projections and Statistics NZ (2011) subnational projections by projection variant to 2031



*Notes: * The 2013 value for SNZ is for 2011 as no equivalent data are available for 2013*

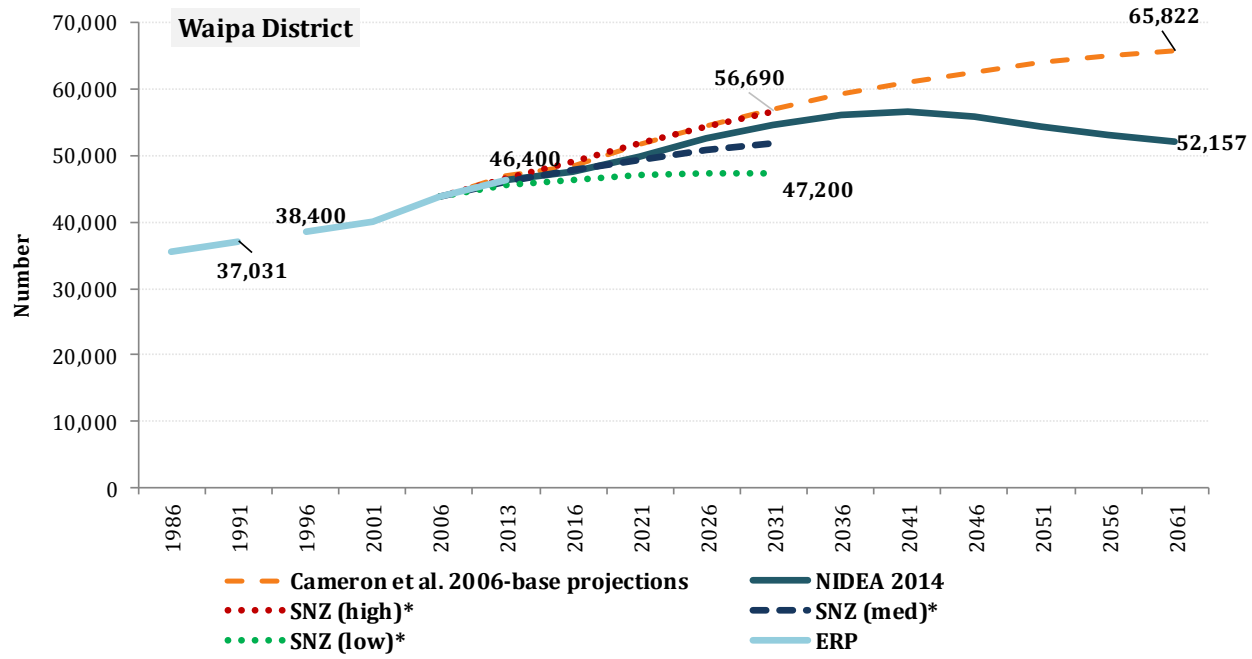
Figure 3.2: Baseline projections for Hamilton City and comparison with the Cameron et al. 2006-base projections and Statistics NZ (2011) subnational projections by projection variant to 2031



*Notes: * The 2013 value for SNZ is for 2011 as no equivalent data are available for 2013*

The situation for the Waipa District (Figure 3.3) differs again. The 2013-base medium variant projections for the Waipa District are almost identical to SNZ's medium variant until 2021, when numbers begin to deviate from the medium variant towards the higher variant. Numbers continue to rise until 2041 and then decline equally sharply. The trajectory also deviates significantly from the 2006-base projections from the outset, the primary reason being substantially slower than projected growth across the period 2006-2013 (averaging 0.9 per cent per annum) than between 1991 and 2006 (1.4 per cent per annum), coupled with the impact of an increasingly older age structure—the latter slowing growth more than anticipated.

Figure 3.3: Baseline projections for the Waipa District and comparison with the Cameron et al. 2006-base projections and Statistics NZ (2011) subnational projections by projection variant to 2031



*Notes: * The 2013 value for SNZ is for 2011 as no equivalent data are available for 2013*

Comparison of the 2007 and 2014 Future Proof Sub-Region Projections – Key Points of Difference

In summary, as is clear from Figures 3.1-3.3, the 2013-base projections (this Report) differ from the 2006-base projections (Cameron et al., 2008). These differences arise because the new projections are based on seven years of additional data on the natural population growth and migration experience of the three TAs. In all cases the growth rates in the 2013-base projections are lower than those in the 2006-base projections. This is because in all cases the population growth achieved by the TAs was lower in the inter-censal period between 2006 and 2013 than the previous inter-censal period, and in the case of Hamilton City and the Waipa District was lower in annualised terms than across the previous 15 years. Annualised population growth from 2006-2013 was 1.2 per cent for the Waikato District (under the 2013 boundaries), 1.3 per cent for Hamilton City, and just 0.9 per cent for the Waipa District. This compares with annualised growth over the period 1991-2006 of 1.0 per cent for the Waikato District (under the 2013 boundaries), 2.0 per cent for Hamilton City, and 1.4 per cent for the Waipa District.

Because population growth remained higher for the Waikato District than its historical trend, the projected growth pattern has not changed much between revisions of the projections. Hamilton City grew more slowly, but its relatively youthful population somewhat offset this and it is some time before the 2013-base projection deviates significantly from the 2006-base projection. The Waipa District, on the other hand, has an older age structure and grew more slowly than previously, leading to a substantial revision in the population projections between the 2006-base and 2013-base projections. However, we note that the 2006-base low projection for the Waipa District is similar to the 2013-base medium projection, while the 2013-base high projection is similar to the 2006-base medium projection. This suggests that the revised projections (i.e. growth rates) for the Waipa District are no greater than would be expected from natural variation.

To pre-empt any concerns regarding the revised (NIDEA) 2013-base projections in this Report being generally higher than those of SNZ, we also remind readers that SNZ's migration assumptions are, as explained in the methodology, based on the application of a constant number of migrants across the projection period, while the NIDEA projections utilise age-specific migration rates. The key outcome is that the SNZ methodology results in the constant number of migrants becoming a smaller proportion of growing populations, and a larger proportion of declining populations as time goes on, while the NIDEA methodology allows the migration rate to keep pace with the changing population size.

The projections are now presented for each TA in turn. The opening graphs for each section include the high, medium and low projections (see Appendices C and D for underlying numbers, and Table 3.1 for a summary of the medium projections). To reduce complexity, the discussion thereafter is based on the medium case projections only. The role of population ageing and diminishing natural increase (the difference between births and deaths) in explaining the trends is highlighted. On the one hand, the youth, young adult and prime reproductive age populations are in most cases reducing, and, on the other, the 65+ year population is increasing. As elsewhere these trends are causing natural increase to diminish and, in many cases, natural decline to begin (where deaths exceed births). Where local populations also experience net migration loss of young adults and/or net gain of retirees, the components interact to accelerate structural ageing and bring about the end of growth/onset of depopulation.

The subsequent projections of household/dwelling numbers are based on the medium variant projections, while the labour force numbers and motor vehicle numbers are based on the high, medium and low projections.

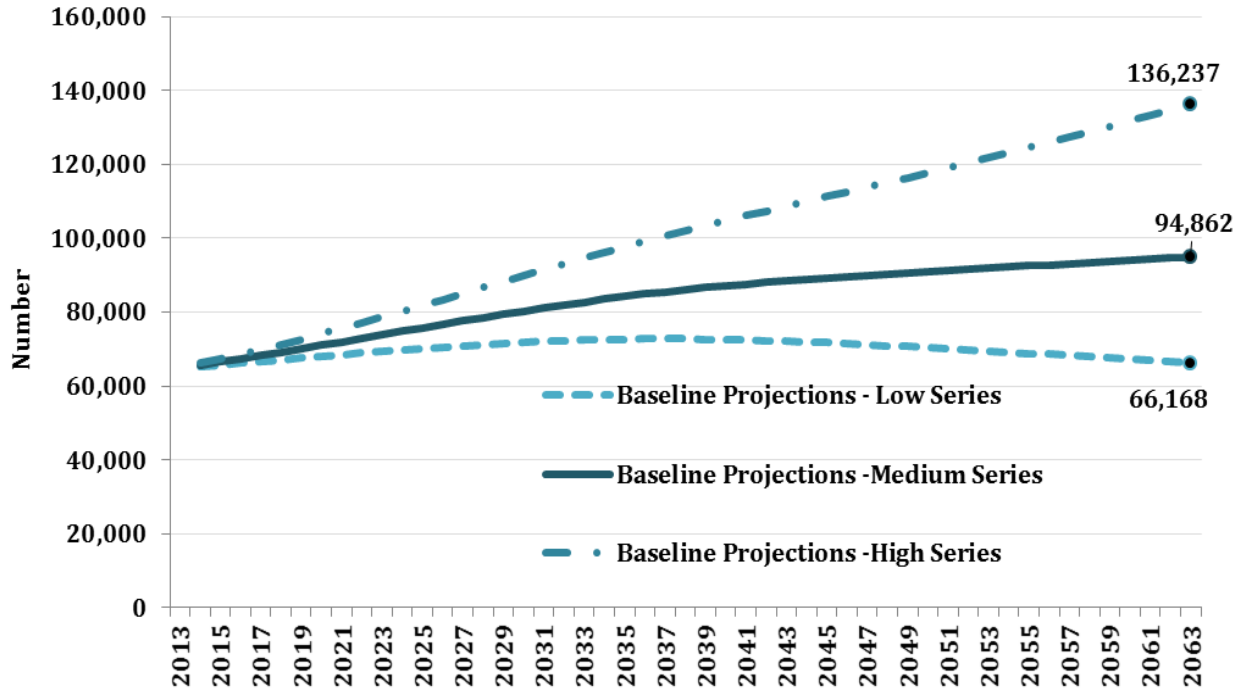
Table 3.1: Projected baseline numbers and annual growth rates for Waikato District, Hamilton City and Waipa District, 2013-2063, Medium Variant

	Waikato District	Hamilton City	Waipa District	Waikato District	Hamilton City	Waipa District
2013	64,910	147,290	46,400	**Growth Rate (Annual)**		
2014	65,698	149,260	46,720	1.21	1.34	0.69
2015	66,518	151,281	47,078	1.25	1.35	0.77
2016	67,369	153,331	47,472	1.28	1.36	0.84
2017	68,229	155,411	47,901	1.28	1.36	0.90
2018	69,126	157,563	48,369	1.31	1.38	0.98
2019	70,054	159,770	48,860	1.34	1.40	1.02
2020	70,997	162,012	49,375	1.35	1.40	1.05
2021	71,950	164,281	49,892	1.34	1.40	1.05
2022	72,904	166,583	50,428	1.33	1.40	1.07
2023	73,861	168,900	50,966	1.31	1.39	1.07
2024	74,814	171,236	51,494	1.29	1.38	1.04
2025	75,761	173,569	52,015	1.27	1.36	1.01
2026	76,693	175,863	52,506	1.23	1.32	0.94
2027	77,610	178,116	52,968	1.20	1.28	0.88
2028	78,513	180,340	53,414	1.16	1.25	0.84
2029	79,403	182,525	53,846	1.13	1.21	0.81
2030	80,278	184,651	54,267	1.10	1.16	0.78
2031	81,123	186,745	54,664	1.05	1.13	0.73
2032	81,945	188,775	55,038	1.01	1.09	0.68
2033	82,733	190,744	55,384	0.96	1.04	0.63
				Growth Rate (Annual Average)		
2038	86,078	199,672	56,452	0.80	0.92	0.38
2043	88,456	207,058	56,247	0.55	0.73	-0.07
2048	90,266	212,864	55,239	0.41	0.55	-0.36
2053	91,867	216,937	53,856	0.35	0.26	-0.42
2058	93,483	219,823	52,742	0.35	0.26	-0.42
2063	94,862	221,390	51,758	0.29	0.14	-0.38
Projected Change (%) 2013-2033 and 2033-2063						
2013-2033	+27.5	+29.5	+19.4	…	…	…
2033-2063	+14.7	+16.1	-6.5	…	…	…

Waikato District

As indicated in Table 3.1, the population of the Waikato District medium series projections is projected to grow from 64,910 in 2013 to around 82,733 in 2033 (+27.5 per cent) and to 94,862 in 2063 (+46.2 per cent) (Figure 3.4). The high variant projections produce a 2033 population of 94,632 (+ 45.8 per cent), and the low projections, 72,446 (+11.6 per cent). By 2063 the high projections would result in a population of 136,237, and the low projections, 66,168 (see Appendix C.1 for data).

Figure 3.4: Projected high, medium and low baseline population, Waikato District



Underlying the shift to slower growth in the medium projections, Figure 3.5 indicates that natural growth will peak around 2025 and then diminish; however it is projected to remain positive throughout the projection period. Net migration is also projected to remain positive across the projection period, averaging 351 per annum between 2013 and 2033 and 219 per annum between 2034 and 2063.

Figure 3.5: Projected components of change (medium baseline projections), Waikato District

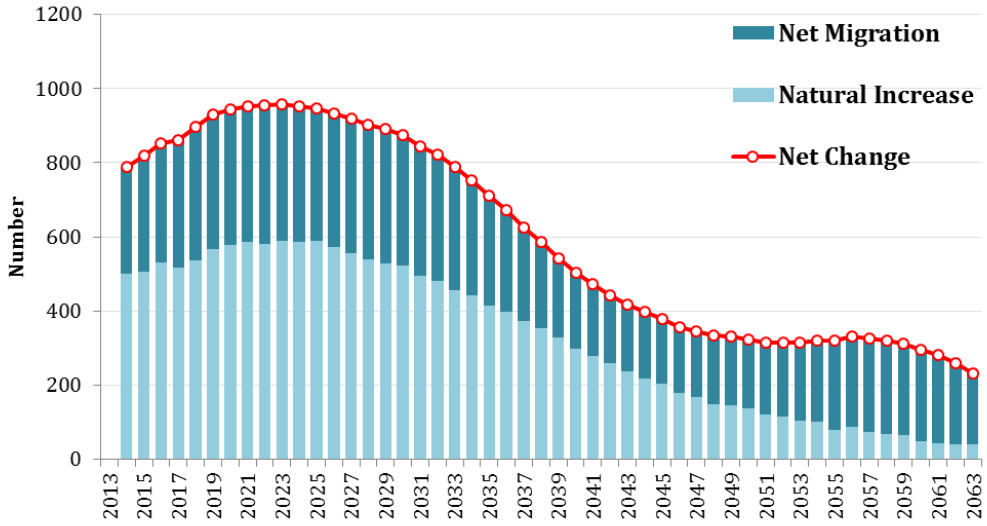
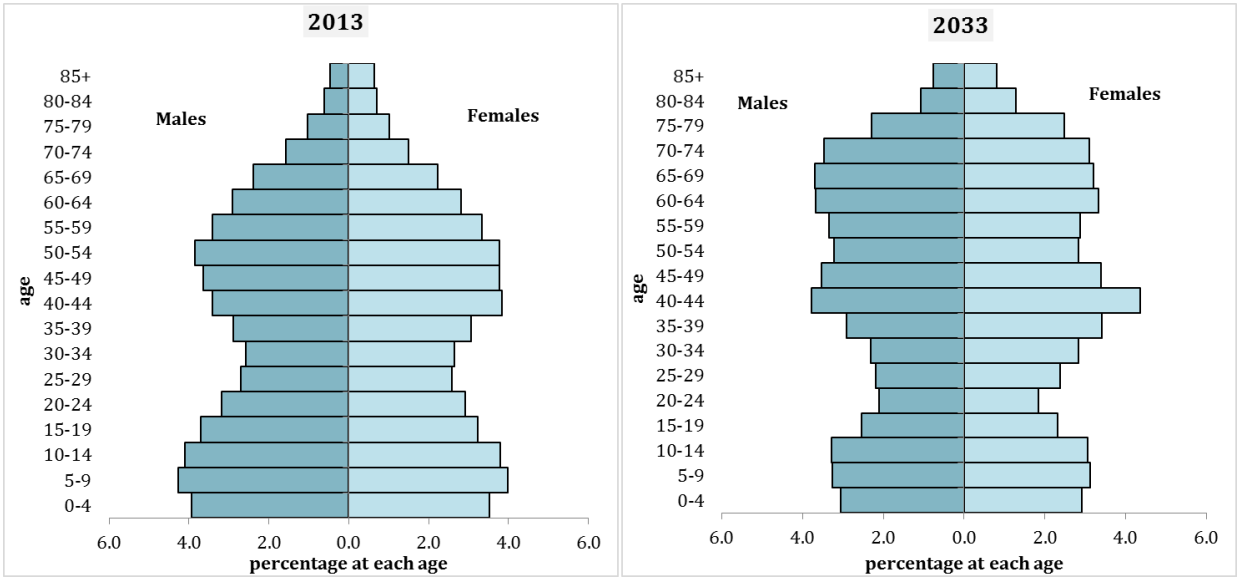


Table 3.2: Projected components of change (medium baseline projections), Waikato District

Waikato District	Births	Deaths	Natural Increase	Net Migration	Net Change
Annual (Number)					
2013	929				
2014	937	436	501	287	788
2015	948	441	507	313	820
2016	956	424	532	319	851
2017	973	457	517	344	860
2018	996	459	536	360	896
2019	1,013	447	566	362	929
2020	1,028	450	578	364	943
2021	1,034	448	586	367	953
2022	1,038	458	580	374	954
2023	1,047	459	588	369	957
2024	1,053	467	586	367	953
2025	1,054	465	589	359	948
2026	1,046	475	571	361	932
2027	1,038	483	555	362	917
2028	1,032	494	538	364	903
2029	1,027	500	527	363	890
2030	1,018	496	522	353	874
2031	1,007	513	494	351	845
2032	1,001	519	482	341	823
2033	997	540	457	331	787
5-Year Totals					
2034-2038	4,934	2,953	1,981	1,365	3,346
2039-2043	4,876	3,472	1,404	973	2,377
2044-2048	4,864	3,947	917	893	1,810
2049-2053	4,938	4,319	619	981	1,601
2054-2058	5,004	4,595	409	1,207	1,616
2059-2063	4,973	4,734	239	1,140	1,379

Underlying diminishing natural increase is, as elsewhere, the structural ageing of the population, depicted in Figure 3.6 (see also Table 3.3). By 2033, 22.2 per cent of the population is projected to be aged 65+ years, up from 12.2 per cent in 2013, and by 2063 it will be around 29.5 per cent (medium case projections). By contrast, the proportion aged 0-14 years is projected to decline from 23.6 per cent in 2013 to 18.7 per cent in 2033, and to 15.8 per cent by 2063. Proportions at 15-39 and 40-64 years are also projected to decline across both periods (see Appendix D.1 for data).

Figure 3.6: Age-sex structure (percentage at each age), 2013 and 2033, Waikato District, medium baseline projections



The data in Table 3.3 also show the ratio of those aged 65+ years to those aged 0-14 years increasing from just above 0.52 in 2013 (52 elderly per 100 children) to 1.18 in 2033, and 1.87 (187 elderly per 100 children) by 2063.

Table 3.3: Projected medium baseline numbers and change by broad age group, Waikato District

Waikato District				Percentage by Broad Age Group		
	2013	2033	2063	2013	2033	2063
0-14	15,320	15,471	14,946	23.6	18.7	15.8
15-39	19,120	20,539	20,417	29.5	24.8	21.5
40-64	22,570	28,392	31,510	34.8	34.3	33.2
65+	7,900	18,330	27,988	12.2	22.2	29.5
Total	**64,910**	**82,733**	**94,862**	**100.0**	**100.0**	**100.0**
85+	720	1,297	3,172	1.1	1.6	3.3
Elderly:Children (Ratio)	0.52	1.18	1.87	.....	.....	.....

Table 3.4 confirms that the largest proportion of the growth will occur at 65+ years, accounting for 58.5 per cent of growth between 2013 and 2033 and almost 80 per cent between 2033 and 2063. Between 2013 and 2033, those aged 0-14 years will contribute just 0.8 per cent of growth, those aged 15-39 years, 8 per cent, and those aged 40-64 years, 32.7 per cent. Between 2033 and 2063 the contribution at both 0-14 years and 15-39 years will be negative, while growth at 40-64 and 65+ years will fully offset that decline. Also notable from Table 3.4 is the contribution to growth at 85+ years, numbers increasing by 577 between 2013 and 2033, accounting for 3.2 per cent of growth, and 1,874 between 2034 and 2063, accounting for 15.5 per cent of growth.

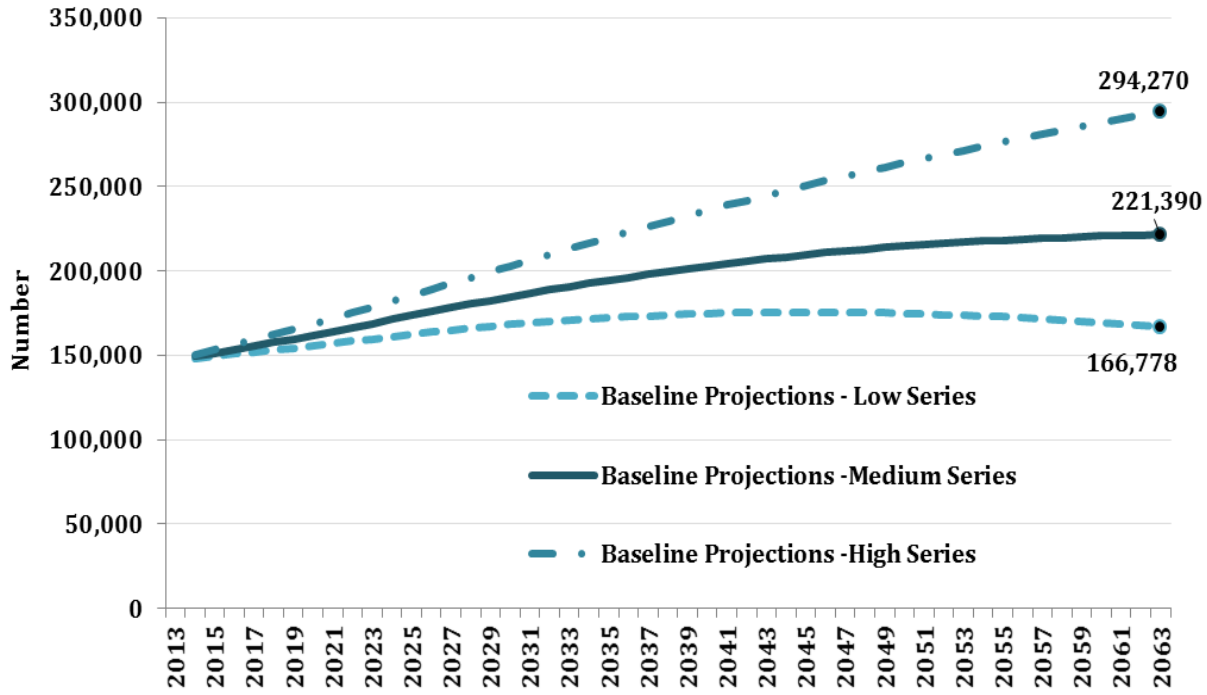
Table 3.4: Projected (medium baseline) contribution to change by broad age group, Waikato District

Waikato District	2013-2033		2033-2063		Total 2013-2063		Contribution to Change (%)		
	Change (N)	Change (%)	Change (N)	Change (%)	Change (N)	Change (%)	2013-2033	2033-2063	2013-2063
0-14	151	1.0	-525	-3.4	-374	-2.4	0.8	-4.3	-1.2
15-39	1,419	7.4	-123	-0.6	1,297	6.8	8.0	-1.0	4.3
40-64	5,822	25.8	3,118	11.0	8,940	39.6	32.7	25.7	29.8
65+	10,430	132.0	9,658	52.7	20,088	254.3	58.5	79.6	67.1
Total	**17,823**	**27.5**	**12,129**	**14.7**	**29,952**	**46.1**	**100.0**	**100.0**	**100.0**
85+	577	80.2	1,874	144.5	2,452	340.5	3.2	15.5	8.2

Hamilton City

Under the medium case projections the population of Hamilton City is projected to grow from 147,290 in 2013 to 190,744 by 2033 (+29.5 per cent), and to 221,390 by 2063 (+50.1 per cent) (Figure 3.7, see also Table 3.1 above). The high variant projections produce a 2033 population of 213,144 (+44.7 per cent), and the low projections, 170,895 (+16.0 per cent). By 2063 the high projections would result in a population of 294,270, and the low projections, 166,778 (see Appendix C.2 for data).

Figure 3.7: Projected high, medium and low baseline population, Hamilton City



The slowing of growth under the medium projections reflects a steady diminishing of natural increase, which shifts to natural decline around 2059. Net migration remains positive across the entire period (Figure 3.8, see also Table 3.5), averaging 758 per annum between 2013 and 2033 and 574 per annum between 2034 and 2063. It should be recalled from the methodology that these numbers are not 'forced' as occurs when a numerical assumption is applied, but arise instead out of applying historical average net migration rates by single year of age, and sex.

Figure 3.8: Projected components of change (medium baseline projections), Hamilton City

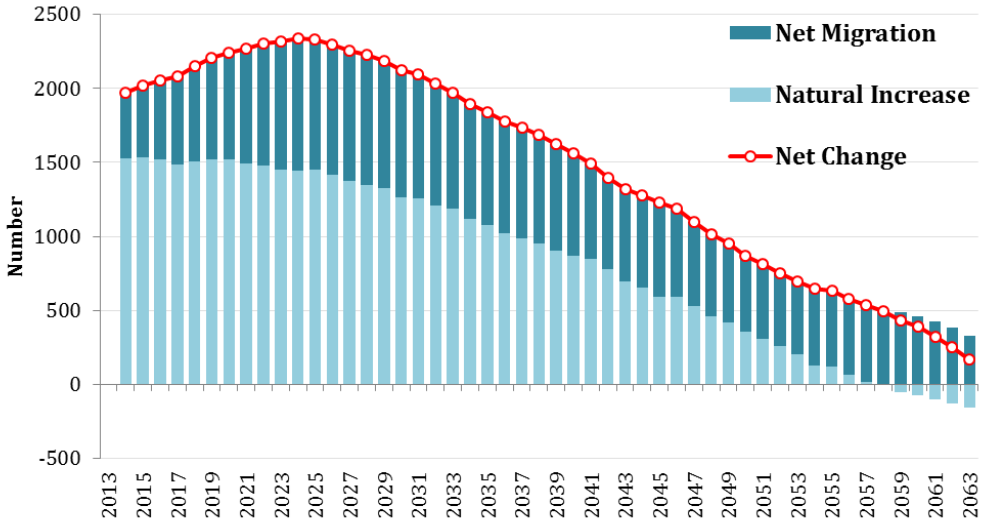


Table 3.5: Projected components of change (medium baseline projections), Hamilton City

Hamilton City	Births	Deaths	Natural Increase	Net Migration	Net Change
			Annual (Number)		
2013	2,396				
2014	2,389	864	1,525	445	1,970
2015	2,376	845	1,532	489	2,021
2016	2,370	850	1,520	530	2,050
2017	2,385	898	1,487	592	2,079
2018	2,396	888	1,508	644	2,152
2019	2,399	876	1,523	684	2,207
2020	2,396	878	1,519	723	2,242
2021	2,387	894	1,492	777	2,270
2022	2,372	891	1,481	821	2,302
2023	2,361	910	1,450	866	2,317
2024	2,348	906	1,441	894	2,336
2025	2,333	885	1,448	886	2,333
2026	2,320	903	1,417	877	2,294
2027	2,306	933	1,373	880	2,253
2028	2,285	941	1,343	881	2,224
2029	2,265	940	1,325	861	2,186
2030	2,249	988	1,261	865	2,126
2031	2,238	978	1,260	834	2,094
2032	2,234	1,024	1,211	819	2,030
2033	2,235	1,051	1,184	785	1,968
			5-Year Totals		
2034-2038	11,225	6,072	5,153	3,775	8,928
2039-2043	11,322	7,231	4,091	3,295	7,386
2044-2048	11,249	8,425	2,824	2,981	5,806
2049-2053	11,058	9,513	1,545	2,529	4,074
2054-2058	10,861	10,530	331	2,555	2,885
2059-2063	10,688	11,200	- 513	2,080	1,567

By 2033, 21.4 per cent of Hamilton City's population is projected to be aged 65+ years, up from 11.3 per cent in 2013 (Figure 3.9 and Table 3.6) (medium projections). By 2063 the proportion is projected to reach 33 per cent. Across the projection period the 65+ year age group shifts from contributing the lowest number per age group, to the highest (Table 3.6) (see Appendix D.2).

Figure 3.9: Age-sex structure (percentage at each age), 2013 and 2033, Hamilton City, medium projections

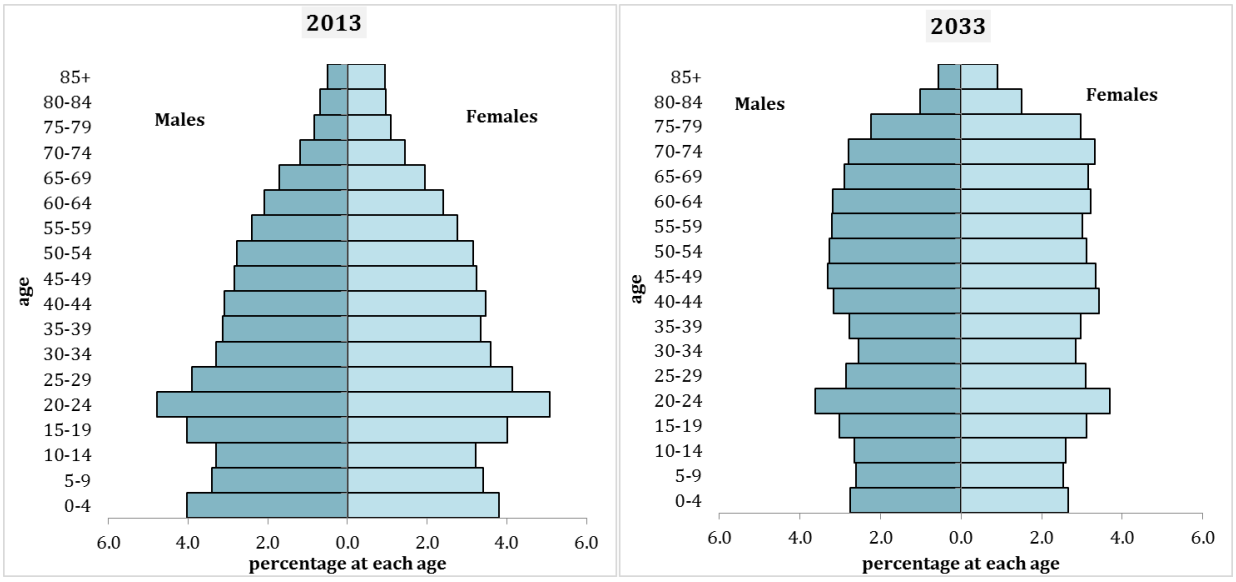


Table 3.6 also shows that the ratio of those aged 65+ years to those aged 0-14 years will increase from 0.53 (53 elderly per 100 children) in 2013 to around 1.34 in 2033, and 2.58 (258 elderly per 100 children) by 2063 – Hamilton City ageing somewhat faster than the Waikato District.

Table 3.6: Projected medium baseline numbers and change by broad age group, Hamilton City

Hamilton City				Percentage by Broad Age Group		
	2013	2033	2063	2013	2033	2063
0-14	31,184	30,155	28,309	21.2	15.8	12.8
15-39	57,873	58,229	55,087	39.3	30.5	24.9
40-64	41,562	61,583	64,964	28.2	32.3	29.3
65+	16,670	40,776	73,030	11.3	21.4	33.0
Total	**147,290**	**190,744**	**221,390**	**100.0**	**100.0**	**100.0**
85+	2,106	2,791	8,851	1.4	1.5	4.0
Elderly:Children (Ratio)	0.53	1.35	2.58	.....	.....	.....

Table 3.7 confirms these trends. Between 2013 and 2033, numbers aged 0-14 years are projected to decline by 1,029, and numbers aged 65+ years to increase by 24,106. However, it is the period 2033 to 2063 where the contribution to growth at 65+ years is most significant, offsetting decline at both 0-14 and 15-39 years. The contribution to growth at 40-64 years is positive across both periods but declines from 46.1 per cent (2013 to 2033) to just 11 per cent (2034-2063), whilst at 65+ years the contribution doubles.

The contribution to growth at 85+ years is again remarkable, with numbers increasing by 685 between 2013 and 2033, accounting for 1.6 per cent of growth, and by 6,059 between 2034 and 2063, accounting for 19.8 per cent of growth.

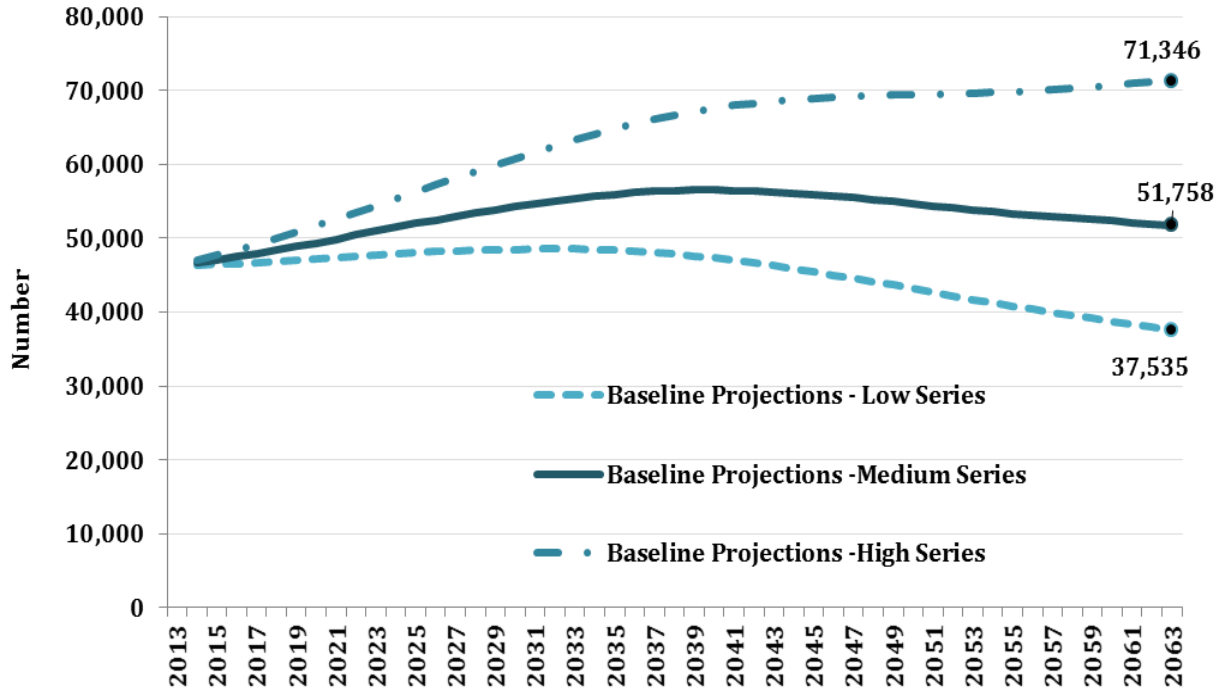
Table 3.7: Projected (baseline) contribution to change by broad age group, Hamilton City

Hamilton City	2013-2033		2033-2063		Total 2013-2063		Contribution to Change (%)		
	Change (N)	Change (%)	Change (N)	Change (%)	Change (N)	Change (%)	2013-2033	2033-2063	2013-2063
0-14	-1,029	-3.3	-1,846	-6.1	-2,875	-9.2	-2.4	-6.0	-3.9
15-39	357	0.6	-3,142	-5.4	-2,786	-4.8	0.8	-10.3	-3.8
40-64	20,021	48.2	3,381	5.5	23,402	56.3	46.1	11.0	31.6
65+	24,106	144.6	32,254	79.1	56,360	338.1	55.5	105.2	76.1
Total	**43,454**	**29.5**	**30,646**	**16.1**	**74,101**	**50.3**	**100.0**	**100.0**	**100.0**
85+	685	32.5	6,059	217.1	6,745	320.2	1.6	19.8	9.1

Waipa District

The population of the Waipa District is projected to experience steady growth over the early part of the projection period, from 46,400 in 2013 to 55,384 by 2033 (+19.4 per cent), but peaking around 2040 and then gradually declining to 51,758 by 2063 (+11.5 per cent over 2013-2033; -6.5 per cent over 2033-2063) (Figure 3.10, see also Table 3.1 above). The high variant projections produce a 2031 population of 63,346 (+36.5 per cent), and the low projections, 48,513 (+4.7 per cent). By 2063 the high projections would result in a population of 71,346, and the low projections, 37,535 (see Appendix C.3 for data).

Figure 3.10: Projected high, medium and low baseline population, Waipa District



The decline from 2040 (medium case projections) reflects the onset of natural decline occurring around 2036 (Figure 3.11, see also Table 3.8). Net migration is projected to average 297 per annum between 2013 and 2033 and 93 per annum between 2034 and 2063. However the trend is far from linear, with a peak in 2024 at 353 persons, followed by steady decline and even negative migration briefly around 2050; then a resurgence. Again it should be recalled that these numbers are not 'forced', but arise out of applying historical average net migration rates by single year of age, and sex.

Figure 3.11: Projected components of change (medium baseline projections), Waipa District

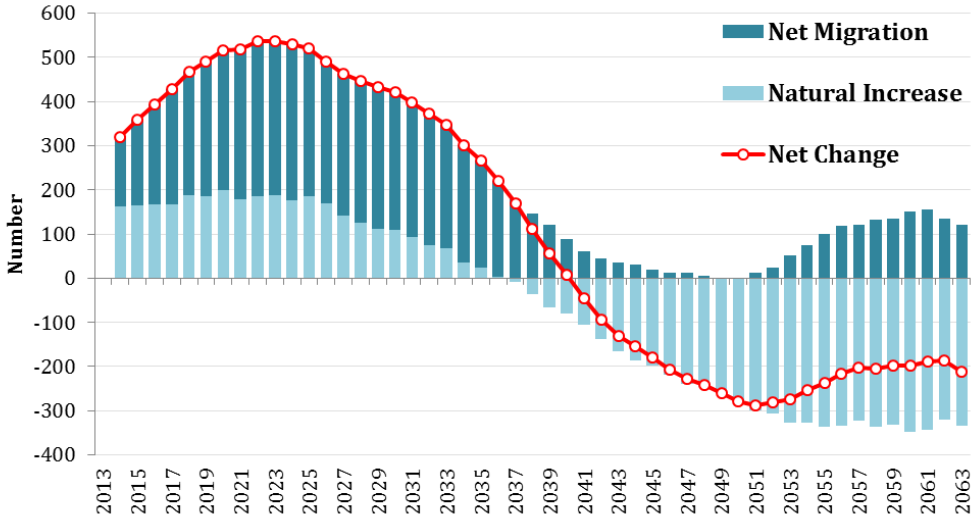
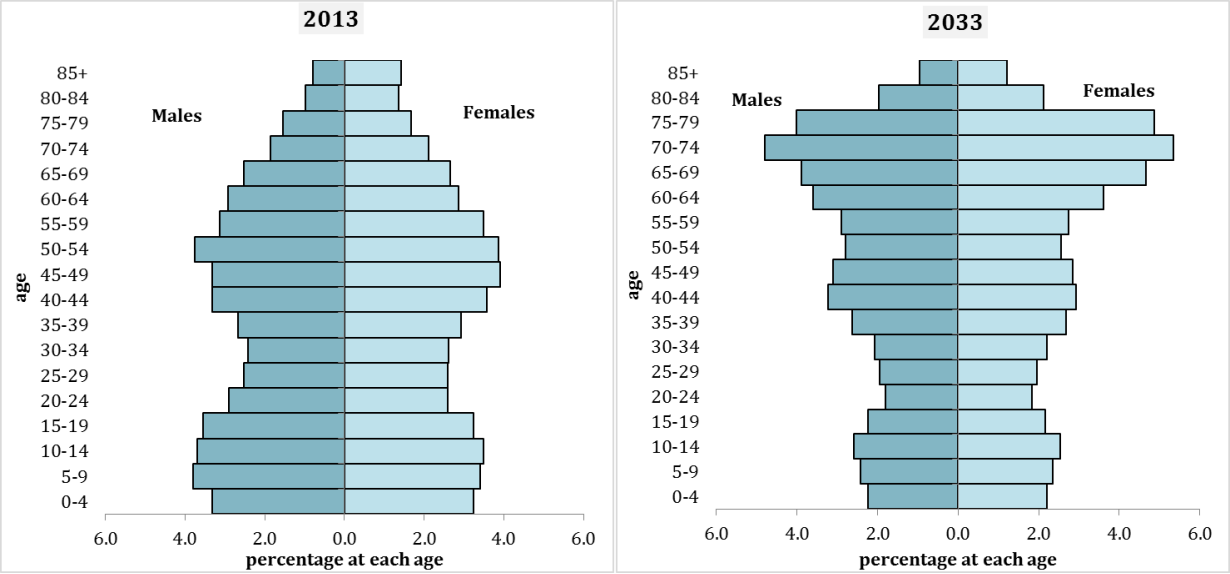


Table 3.8 : Projected components of change (medium baseline projections), Waipa District

Waipa District	Births	Deaths	Natural Increase	Net Migration	Net Change
			Annual (Number)		
2013	571				
2014	565	403	162	158	320
2015	562	397	165	193	358
2016	559	391	168	226	394
2017	563	395	167	261	428
2018	564	377	188	281	468
2019	562	377	185	307	491
2020	558	358	200	315	515
2021	554	377	178	340	518
2022	550	366	185	351	536
2023	548	360	188	350	538
2024	543	367	176	353	529
2025	538	353	184	337	521
2026	530	361	169	322	491
2027	523	382	141	320	462
2028	520	395	125	320	446
2029	517	405	112	321	433
2030	511	401	110	311	421
2031	504	411	93	304	397
2032	500	426	74	300	374
2033	495	428	67	279	346
			5-Year Totals		
2034-2038	2,420	2,403	17	1,050	1,067
2039-2043	2,315	2,870	- 554	350	- 204
2044-2048	2,194	3,283	- 1,089	81	- 1,008
2049-2053	2,096	3,563	- 1,467	84	- 1,383
2054-2058	2,013	3,671	- 1,658	544	- 1,114
2059-2063	1,927	3,605	- 1,678	694	- 984

By 2033 one-third of the Waipa District's population is projected to be aged 65+ years, up from 16.9 per cent in 2013 (Figure 3.12 and Table 3.9). By 2063, that proportion is projected to reach 42.7 per cent. This is a significant rate of structural ageing, driven initially by decline in numbers and proportions at 0-14 and 15-39 years, followed by those at 40-64 years across the period 2033-2063 (see Appendix D.3 for data).

Figure 3.12: Age-sex structure (percentage at each age), 2013 and 2033, Waipa District, medium projections



The data in Table 3.9 show the ratio of those aged 65+ years to those aged 0-14 years increasing from 0.81 (81 elderly per 100 children) in 2013 to 2.36 in 2033, and 3.66 (366 elderly per 100 children) by 2063 - Waipa District ageing much more rapidly than either the Waikato District or Hamilton City.

Table 3.9 : Projected medium baseline numbers and change by broad age group, Waipa District

Waipa District				Percentage by Broad Age Group		
	2013	2033	2063	2013	2033	2063
0-14	9,710	7,940	6,027	20.9	14.3	11.6
15-39	13,000	11,907	8,997	28.0	21.5	17.4
40-64	15,840	16,800	14,644	34.1	30.3	28.3
65+	7,850	18,738	22,089	16.9	33.8	42.7
Total	**46,400**	**55,384**	**51,758**	**100.0**	**100.0**	**100.0**
85+	1,030	1,198	2,724	2.2	2.2	5.3
Elderly:Children (Ratio)	0.81	2.36	3.66	.....	.....	.....

Table 3.10 confirms these trends. Between 2013 and 2033, the growth at 65+ years offsets decline at 0-14 and 15-39 years, but is insufficient to do so across the period 2033-2063, resulting in negative growth overall (-6.5 per cent). Differing from both the Waikato District and Hamilton City, the majority of the growth at 65+ years occurs in the earlier part of projection period.

Also contrasting with the Waikato District and Hamilton City, the contribution to growth at 85+ years is considerably greater for Waipa - albeit actual numbers are somewhat lower. Numbers increase by 168 between 2013 and 2033 and 1,526 between 2034 and 2063, accounting for 1.9 per cent of growth in the period 2013-2033 and 42.1 per cent between 2034 and 2063.

Table 3.10 : Projected (medium baseline) contribution to change by broad age group, Waipa District

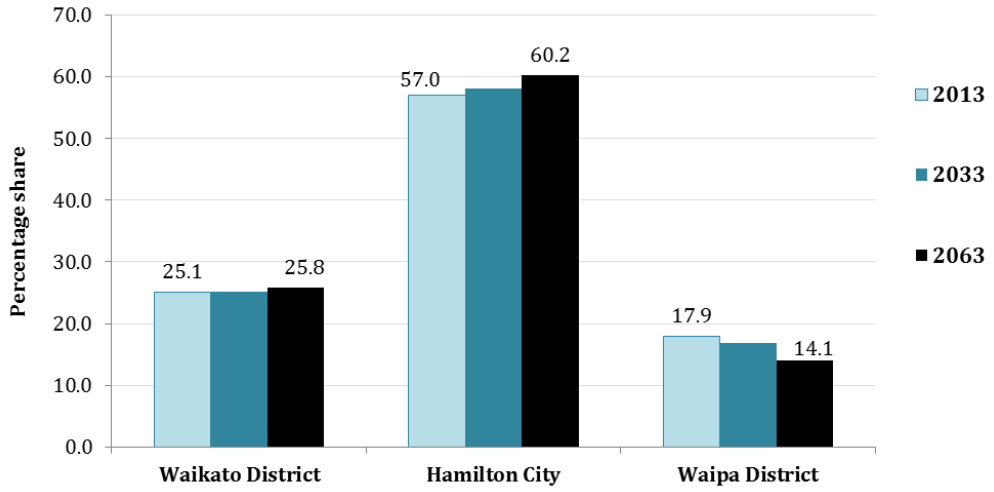
Waipa District	2013-2033		2033-2063		Total 2013-2063		Contribution to Change (%)		
	Change (N)	Change (%)	Change (N)	Change (%)	Change (N)	Change (%)	2013-2033	2033-2063	2013-2063
0-14	-1,770	-18.2	-1,913	-24.1	-3,683	-37.9	-19.7	-52.7	-68.7
15-39	-1,093	-8.4	-2,910	-24.4	-4,003	-30.8	-12.2	-80.2	-74.7
40-64	960	6.1	-2,156	-12.8	-1,196	-7.6	10.7	-59.5	-22.3
65+	10,888	138.7	3,352	17.9	14,239	181.4	121.2	92.4	265.8
Total	**8,984**	**19.4**	**-3,626**	**-6.5**	**5,358**	**11.5**	**100.0**	**-100.0**	**100.0**
85+	168	16.4	1,526	127.3	1,694	164.5	1.9	42.1	31.6

Projected Population Shares - Summary

The data presented in Section 3 indicate only a small shift in population share. This is clear from Figure 3.13, which shows Hamilton City under the medium projections increasing its share of the Region's population from 57 per cent in 2013 to 60.2 per cent in 2063, a rise of 3.2 per cent.

Also projected to gain slightly in population share is the Waikato District, increasing from 25.1 to 25.8 per cent (+0.7 per cent). By contrast, Waipa District is likely to see a small reduction in share, from 17.9 per cent in 2013 to 16.8 per cent in 2033, and 14.1 per cent in 2063.

Figure 3.13: Percentage share of total population for Waikato District, Hamilton City and Waipa District; 2013, 2033, 2063, medium projections



The trends are similar by broad age group (Figure 3.14), but slightly more marked at 65+ years, with Hamilton City by 2063 projected to be home to 59.3 per cent of this age group.

Figure 3.14: Percentage share of total population for Waikato District, Hamilton City, Waipa District by age group; 2013, 2033, 2063, medium projections

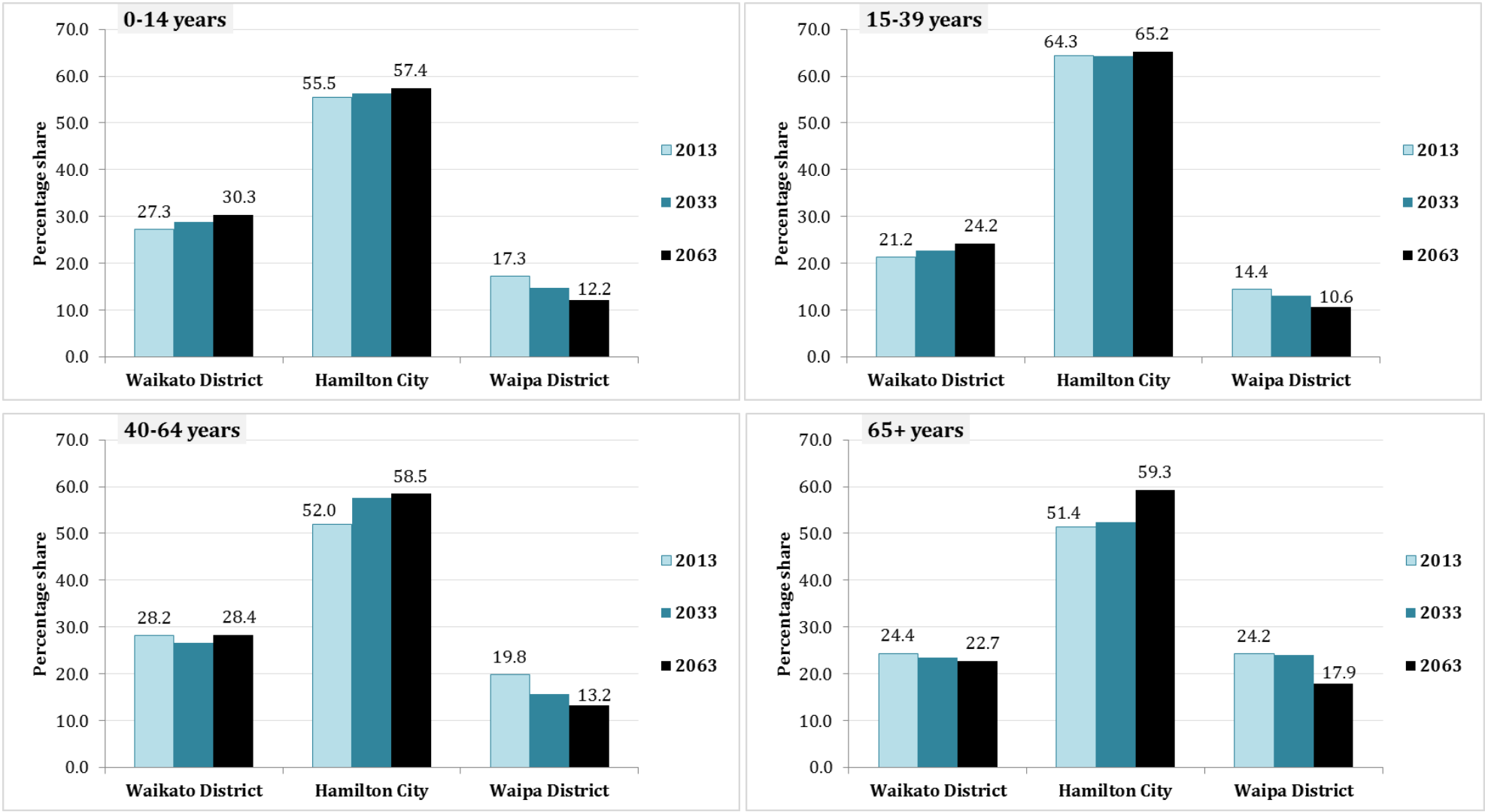


Table 3.11: Percentage share of total population for Waikato District, Hamilton City, Waipa District; 2013, 2033, 2063

	Number			Percentage Share		
	2013	2033	2063	2013	2033	2063
Waikato District						
0-14	15,320	15,471	14,946	27.3	28.9	30.3
15-39	19,120	20,539	20,417	21.2	22.7	24.2
40-64	22,570	28,392	31,510	28.2	26.6	28.4
65+	7,900	18,330	27,988	24.4	23.5	22.7
Hamilton City						
0-14	31,184	30,155	28,309	55.5	56.3	57.4
15-39	57,873	58,229	55,087	64.3	64.2	65.2
40-64	41,562	61,583	64,964	52.0	57.7	58.5
65+	16,670	40,776	73,030	51.4	52.4	59.3
Waipa District						
0-14	9,710	7,940	6,027	17.3	14.8	12.2
15-39	13,000	11,907	8,997	14.4	13.1	10.6
40-64	15,840	16,800	14,644	19.8	15.7	13.2
65+	7,850	18,738	22,089	24.2	24.1	17.9
Future Proof Waikato Region (Waikato District, Hamilton City and Waipa District)						
0-14	56,214	53,567	49,283	100.0	100.0	100.0
15-39	89,993	90,675	84,501	100.0	100.0	100.0
40-64	79,972	106,775	111,118	100.0	100.0	100.0
65+	32,420	77,843	123,108	100.0	100.0	100.0

Table 3.12 provides an overall comparative summary of key indicators.

Continuing growth but slowing towards the end of the projection period is characteristic for both the Waikato District and Hamilton City. Waipa District, while experiencing growth in the earlier projection period, shifts into natural decline around 2036 and overall decline shortly thereafter.

In addition to the differing migration age profiles underlying the projections, the trends reflect baseline differences in population age structure. In 2013, Hamilton City stands out as having the structurally youngest population, with just 11.3 per cent aged 65+ years, and the Waikato District only slightly older (both being somewhat lower than the national average of 14.2 per cent) (SNZ 2013). By contrast the Waipa District has the structurally oldest population, at 16.9 per cent, somewhat above the national average. The picture at 85+ years is similar, with the Waipa District in 2013 having 2.2 per cent aged 85+ years, double that of the Waikato District and above the national average of 1.7 per cent.

Reflecting these baselines, structural ageing is projected to be more rapid in the Waipa District, with the proportion aged 65+ years in 2033 well above the SNZ projected national average of 21.3 per cent. By comparison, for both the Waikato District and Hamilton City the proportions aged 65+ years in 2033 are similar to the projected national average, at 22.2 per cent and 21.4 per cent respectively. The trends will see the Waipa District enter natural decline while both the Waikato District and Hamilton City continue to grow from both natural increase and net migration gain.

Table 3.12: Summary indicators for Waikato District, Hamilton City, Waipa District; 2013, 2033, 2063

	Growth (%)	Decline (%)	65+ Years (%)	85+ Years (%)	Natural Decline (Year)
Waikato District					
2013	…	…	+12.2	+1.1	…
2033	+27.5	…	+22.2	+1.6	…
2063	+14.7	…	+29.5	+3.3	…
Hamilton City					
2013	…	…	+11.3	+1.4	…
2033	+29.5	…	+21.4	+1.5	…
2063	+16.1	…	+33.0	+4.0	…
Waipa District					
2013	…	…	+16.9	+2.2	
2033	+19.4	…	+33.8	+2.2	2036
2063	…	-6.5	+42.7	+5.3	

4. Household and Dwelling Projections

This section covers the projection of the number of households by household type for the period 2013-2063 based on the baseline deterministic projections for each territorial authority. The method used is the same as that currently employed by SNZ (the propensity method).

In the propensity method, living arrangement type rates (or propensities) are applied to population projections to give projections of the population in different living arrangement types. These projections are subsequently aggregated to give projections of families (by broad family type) and households (by broad household type). The calculations are as follows;

The number of couple without children-families

$$= \frac{male\ partners\ in\ couple\ without\ children\ families\ +\ female\ partners\ in\ couple\ without\ children\ families}{2}$$

The number of two-parent families

$$= \frac{male\ partners/parents\ \ two-parent\ families\ +\ female\ partners/parents\ \ two-parent\ families}{2}$$

The number of one-parent families

$$= male\ parents\ in\ one-parent\ families\ +\ female\ parents\ in\ one-parent\ families$$

The number of family households

$$= number\ of\ families\ \div\ average\ number\ of\ families\ per\ family\ household.$$

The number of one-person households

$$=\ number\ of\ people\ in\ one-person\ households.$$

The number of other multi-person households

$$= \frac{number\ of\ people\ in\ other\ multi-person\ households}{average\ number\ of\ people\ per\ other\ multi-person\ household}$$

Supporting assumptions are required to allow the projection of the number of family households (average number of families per family household) and the number of other multi-person households (average number of people per other multi-person household). SNZ in its 2010 update of the Subnational Family and Household Projections assumed that the average number of families per family household and the average number of people per other multi-person household would remain constant at 2006 levels. We adopt those assumptions here (see Tables 4.1 and 4.2).

Table 4.1: Average number of families per family household, 2006

	Waikato	Hamilton	Waipa
2006	1.04	1.04	1.02

Table 4.2: Average number of people per other multi-person household, 2006

	Waikato	Hamilton	Waipa
2006	2.3	2.8	2.3

Tables 4.3 to 4.6 report the household projections for the Waikato District, Hamilton City, Waipa District and the Future Proof sub-region. From these data, several broad trends are apparent. Taking the Future Proof sub-region as a whole, there is a marked increase in couple without children families (+110 percent), reflecting declining fertility, an ageing population and a mild convergence of male and female life expectancy (SNZ 2010, p. 13). The effects of population ageing are also apparent in the increasing numbers of one person households over the projection period (an increase of nearly 150 percent) —although this increase may be affected over time depending on trends in life expectancy at older ages. The numbers of two-parent families increased slightly (+7 percent), reflecting the impact of declining fertility and ageing population, as well as, to a lesser extent, the relative increases in the prevalence of single-parent families.

The Waikato District exhibits a similar overall pattern to the sub-region with strong growth in the number in the couples without children 2013-2063 (+110 percent), one-person households (around +140 percent) and, to a lesser extent, couples without children (+15 percent). Overall the number of households in the district is projected to grow by 78 percent.

The number of households in Hamilton City is projected to rise by over 48,000 (around 90 percent) with the largest growth in percentage terms being in couples without children (around 130 percent) and one-person households (+170 percent).

Projected growth in household numbers (around +40 percent) in the Waipa District is somewhat more muted than in either Hamilton City (around +90 percent) or the Waikato District (about +80 percent) with declines in the number of two-parent families (-25 percent) and, marginally, single-parent families. Conversely, the number of couple without children (+65 percent) and one-person households (+91 percent) increases. While, for both Hamilton City and the Waikato District the rate of growth slows over the projection period, for the Waipa District the projected number of households peaks at around 26,300 households in 2043 with negative growth thereafter.

Table 4.3: Waikato District household projections by type (number) 2013-2063

	Families				Households			
Year	Couple without children-families	Two-parent families	One-parent families	Total families	Family households	One-person households	Other multi-person households	Total
2013	7,856	7,499	3,402	18,756	18,016	5,005	594	23,615
2018	9,290	7,685	3,716	20,691	19,874	5,888	646	26,408
2023	10,636	7,905	4,058	22,598	21,706	6,927	691	29,324
2028	11,791	8,152	4,402	24,346	23,385	8,034	734	32,153
2033	12,738	8,413	4,701	25,853	24,832	9,038	760	34,630
2038	13,503	8,652	4,902	27,057	25,990	9,767	784	36,541
2043	14,268	8,676	5,001	27,945	26,842	10,346	808	37,996
2048	15,005	8,610	5,042	28,657	27,526	10,782	827	39,136
2053	15,641	8,570	5,110	29,322	28,165	11,092	839	40,096
2058	16,158	8,586	5,187	29,930	28,749	11,466	840	41,055
2063	16,462	8,619	5,272	30,352	29,154	11,969	839	41,963

Figure 4.1: Waikato District projected number of households by type, 2013-2063

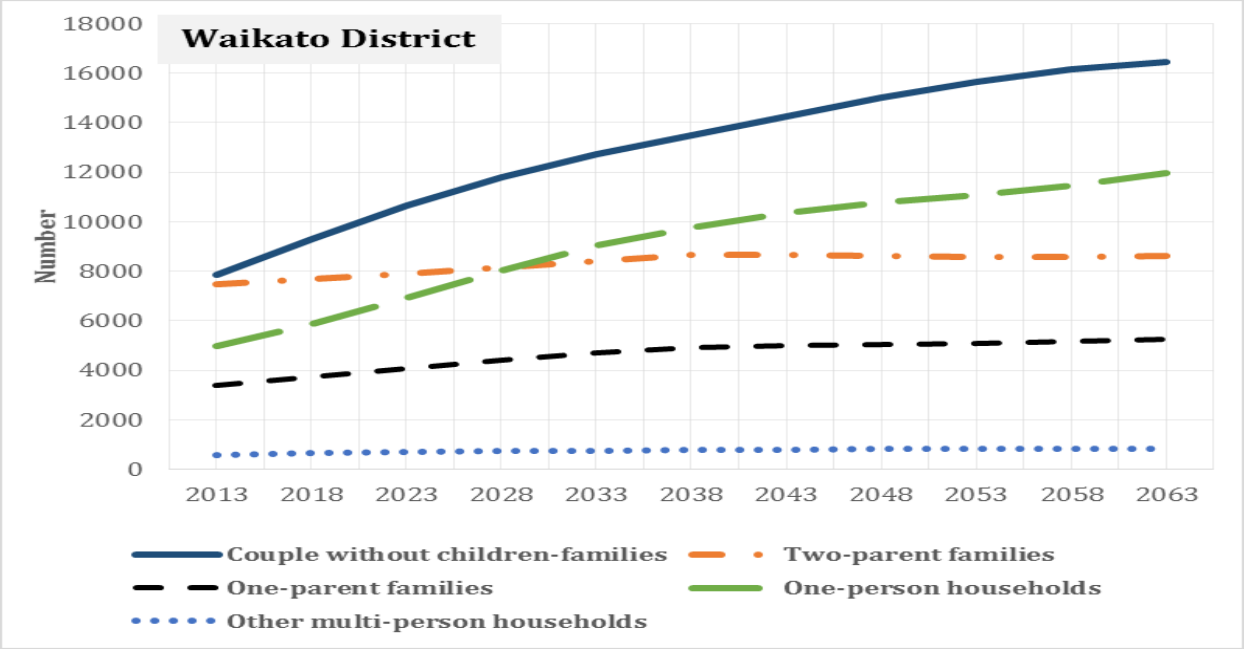


Table 4.4: Hamilton City household projections by type (number), 2013-2063

	Families				Households			
Year	Couple without children-families	Two-parent families	One-parent families	Total families	Family households	One-person households	Other multi-person households	Total
2013	16,257	14,584	8,760	39,601	38,007	13,112	3,678	54,797
2018	18,968	15,445	9,462	43,875	42,109	15,284	3,741	61,134
2023	21,947	16,042	10,112	48,100	46,164	18,122	3,802	68,087
2028	25,051	16,294	10,746	52,092	49,995	21,337	3,990	75,322
2033	28,068	16,448	11,284	55,801	53,554	24,533	4,170	82,257
2038	30,610	16,706	11,674	58,991	56,617	27,339	4,200	88,156
2043	32,798	16,814	11,900	61,511	59,035	29,717	4,223	92,975
2048	34,522	16,865	12,053	63,439	60,885	31,721	4,204	96,811
2053	35,735	16,888	12,141	64,764	62,157	33,293	4,163	99,613
2058	36,587	16,843	12,214	65,644	63,002	34,569	4,150	101,721
2063	37,121	16,697	12,247	66,066	63,406	35,574	4,151	103,132

Figure 4.2: Hamilton City projected number of households by type, 2013-2063

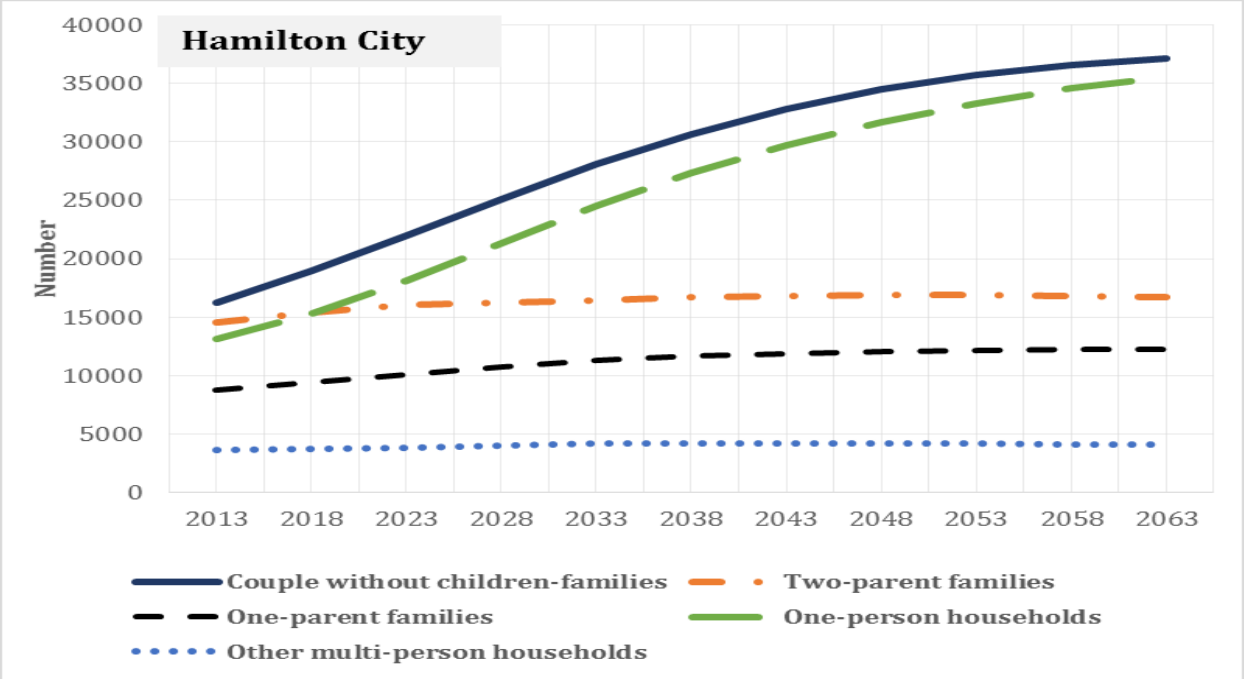


Table 4.5: Waipa District household projections by type (number), 2013-2063

	Families				Households			
Year	Couple without children-families	Two-parent families	One-parent families	Total families	Family households	One-person households	Other multi-person households	Total
2013	6,547	5,041	2,012	13,600	13,279	4,236	480	17,995
2018	7,729	4,937	2,053	14,719	14,371	4,748	506	19,626
2023	8,924	4,851	2,118	15,893	15,518	5,567	526	21,611
2028	9,962	4,775	2,199	16,936	16,537	6,489	547	23,573
2033	10,689	4,721	2,261	17,672	17,255	7,397	552	25,204
2038	11,046	4,663	2,296	18,005	17,580	8,065	548	26,193
2043	11,086	4,513	2,279	17,878	17,456	8,405	537	26,398
2048	10,996	4,318	2,224	17,538	17,124	8,419	526	26,069
2053	10,882	4,128	2,148	17,158	16,753	8,235	508	25,496
2058	10,874	3,945	2,072	16,891	16,492	8,107	493	25,093
2063	10,850	3,773	2,007	16,629	16,237	8,092	481	24,810

Figure 4.3: Waipa District projected number of households by type, 2013-2063

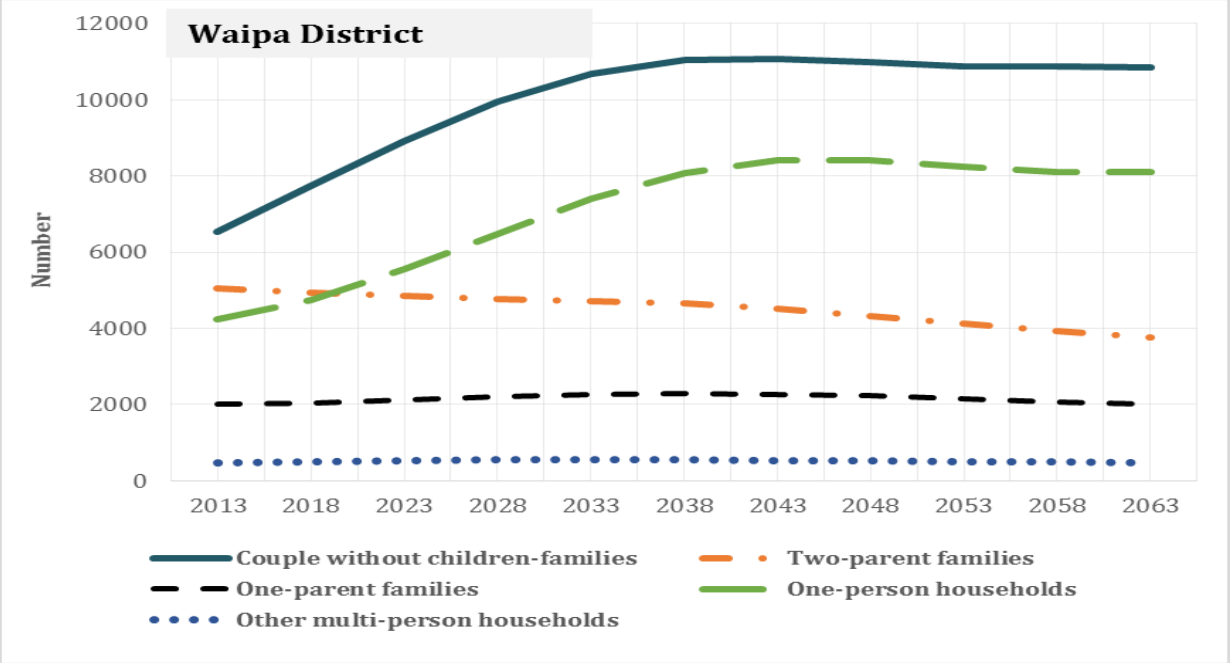
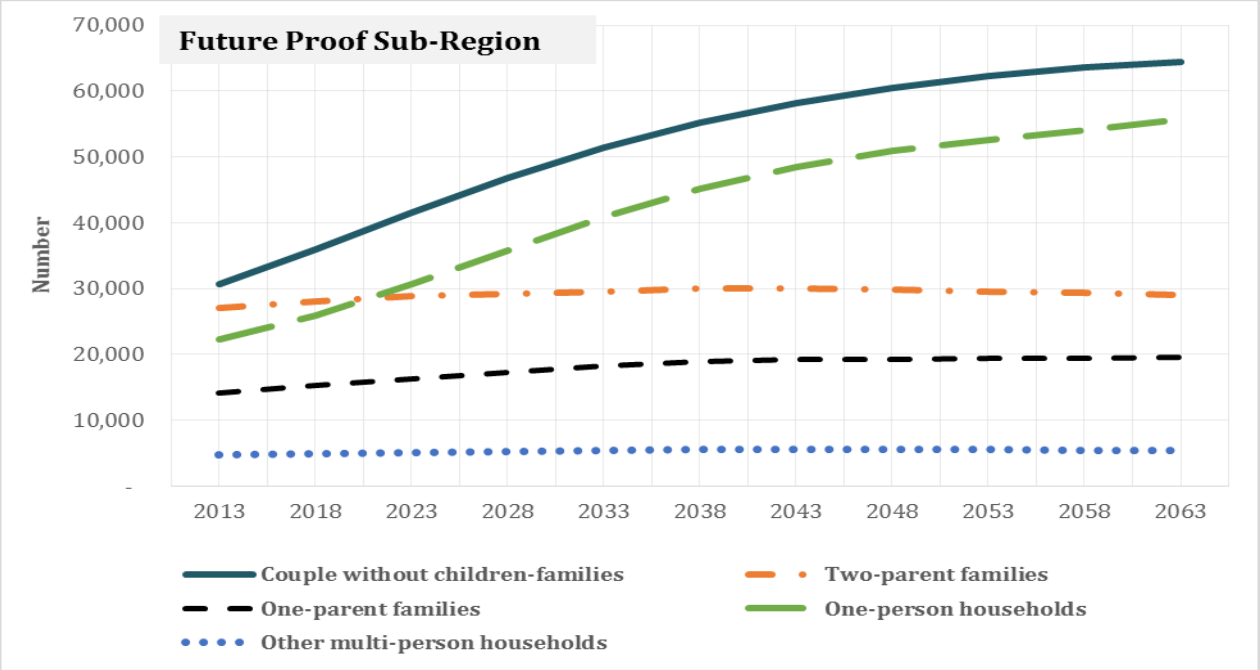


Table 4.6: Future Proof sub-region household projections by type (number), 2013-2063

	Families				Households			
Year	Couple without children-families	Two-parent families	One-parent families	Total families	Family households	One person households	Other multi-person households	Total
2013	30,660	27,124	14,173	71,957	69,302	22,353	4,752	96,407
2018	35,987	28,066	15,230	79,284	76,354	25,921	4,893	107,168
2023	41,506	28,797	16,287	86,591	83,387	30,616	5,019	119,022
2028	46,805	29,222	17,347	93,374	89,917	35,860	5,271	131,047
2033	51,495	29,583	18,247	99,325	95,642	40,968	5,482	142,092
2038	55,159	30,022	18,872	104,054	100,186	45,171	5,533	150,890
2043	58,153	30,002	19,180	107,335	103,334	48,467	5,567	157,368
2048	60,523	29,792	19,319	109,634	105,536	50,923	5,558	162,016
2053	62,258	29,586	19,400	111,245	107,076	52,620	5,510	165,206
2058	63,618	29,374	19,472	112,465	108,243	54,142	5,484	167,869
2063	64,433	29,089	19,526	113,047	108,798	55,636	5,471	169,905

Figure 4.4: Future Proof sub-region projected number of households by type, 2013-2063

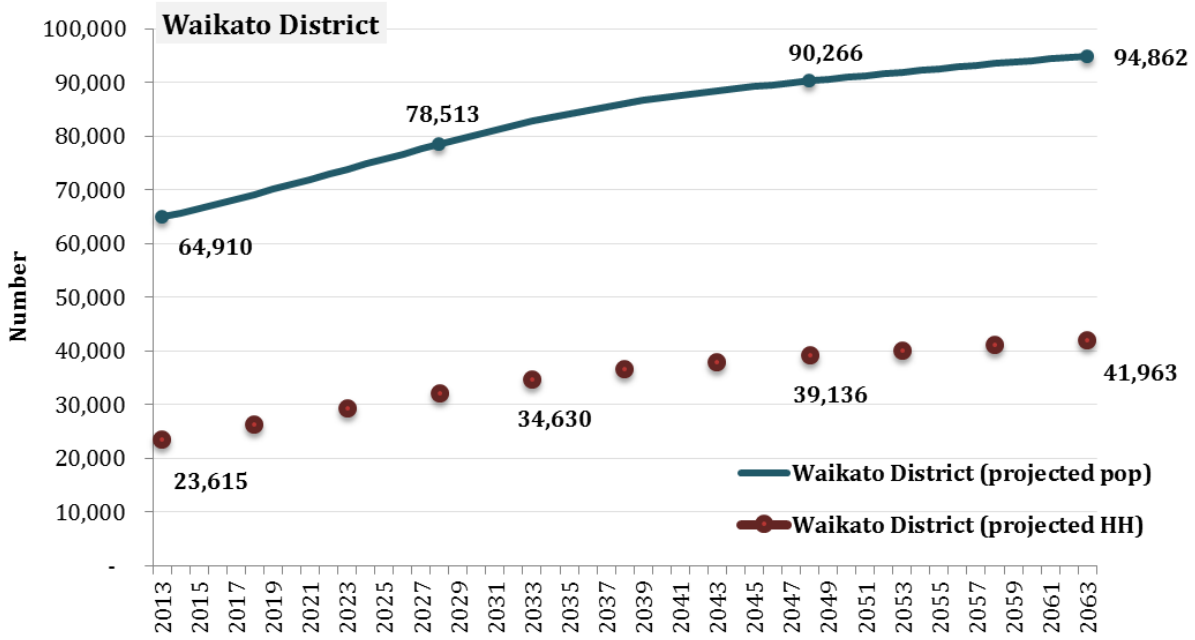


Household and Population Projections

This section provides a comparison of the population projections with projected household numbers (see Appendix E for data).

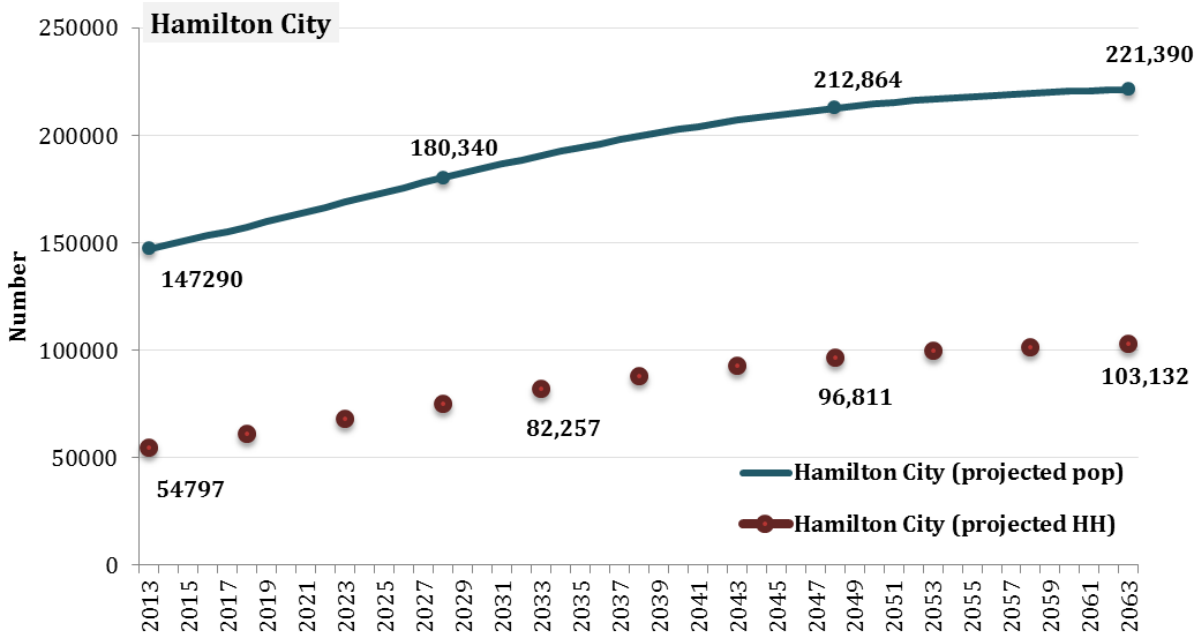
As indicated above, the Waikato District is projected to see a gradual slowing in the number of households out to 2063, as observed in Figure 4.5. Over the projection period the number of households relative to the population rises, because of the growth in one-person households driven by population ageing.

Figure 4.5: Projected population and household numbers, Waikato District, 2013-2063



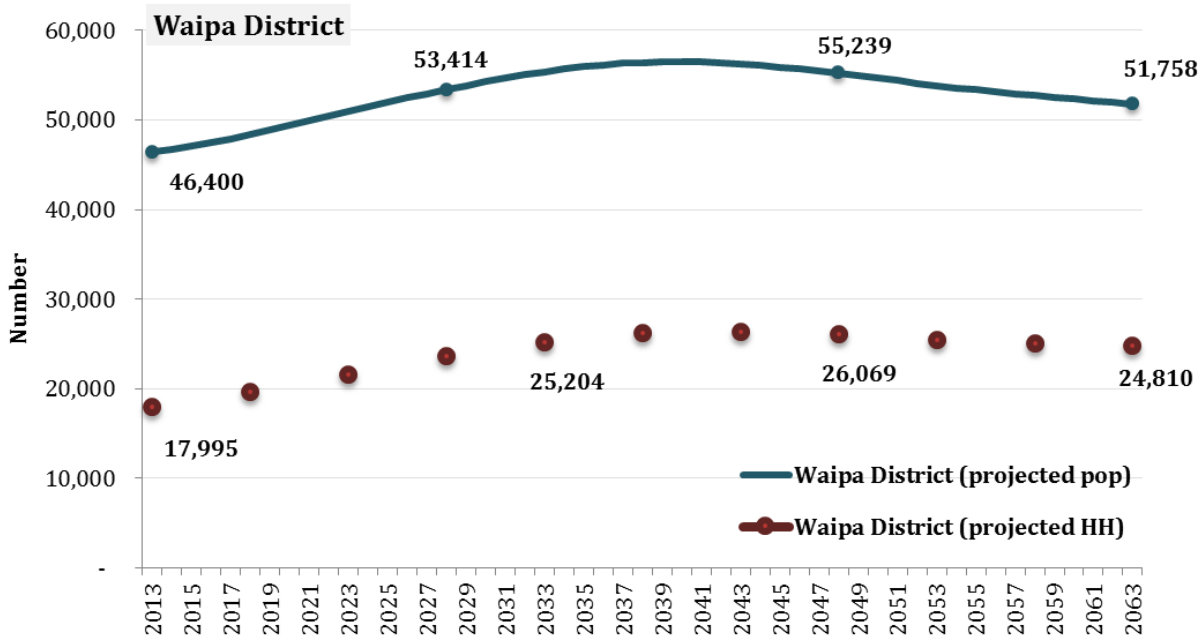
As can be similarly observed in Figure 4.6, for Hamilton City both projected population numbers and projected households increase out to 2063. The number of households relative to number of population increases over the entire projection period, because of the growth in one-person households, as for the Waikato District.

Figure 4.6: Projected population and household numbers, Hamilton City, 2013-2063



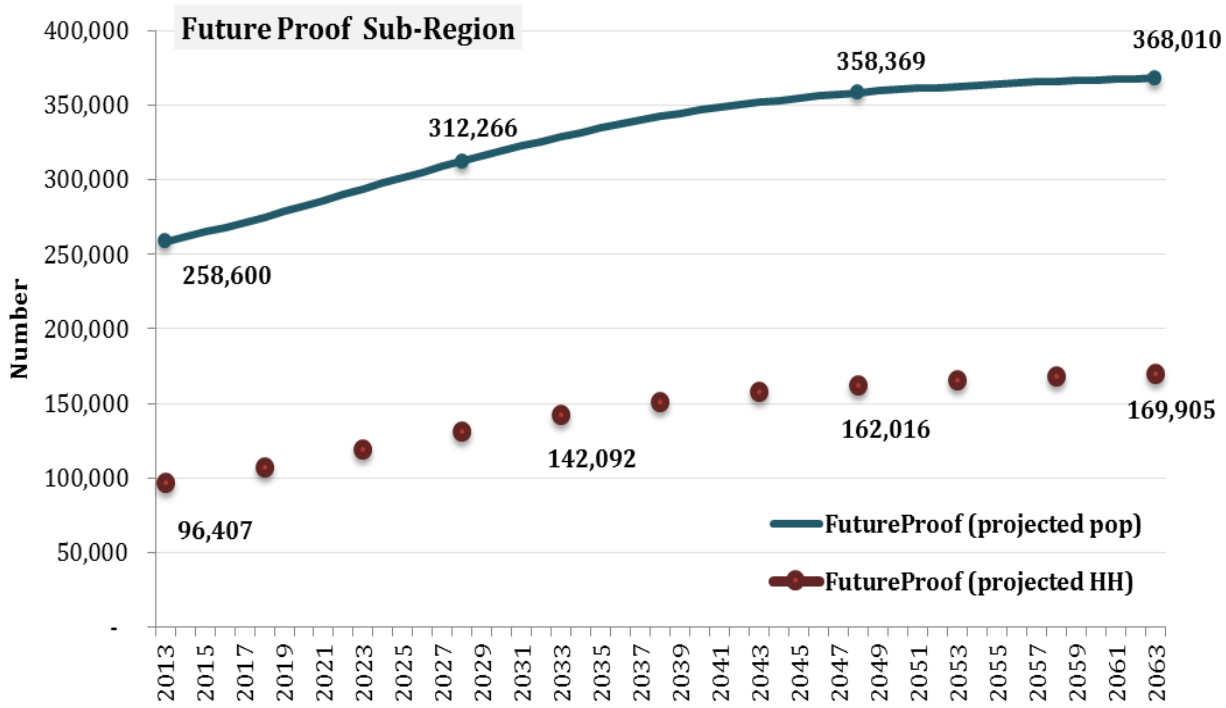
For the Waipa District the projections for both population and household numbers (Figure 4.7), peak around 2038 before declining. The number of households relative to population, however, continues to rise, reflecting the greater impact of population ageing in the Waipa District and the greater (relative) increase in one-person households.

Figure 4.7: Projected population and household numbers, Waipa District, 2013-2063



For the Future Proof sub-region as a whole (Figure 4.8), the projections indicate a slowing of growth 2034-2063, of both population and households. However as for the TAs which comprise the sub region, the number of households is projected to increase relative to population because of the significant rise in the number of one-person households in all three TAs (Table 4.6).

Figure 4.8: Projected population and household numbers, Future Proof sub-region, 2013-2063



5. Labour Force Projections

The labour force is comprised of members of the working age population (15 years or more)[5] who are either employed (part-time or full-time) or unemployed and actively seeking work. The labour force participation (LFP) rate thus measures the proportion of the population aged 15+ years that is in the labour force. The following projections are based on labour force participation rates.

To provide additional context for the Future Proof sub-region we begin with Table 5.1, which gives the age-specific LFP rates and also employment to population ratios, as recorded at the Census 2001 and 2013, and the percentage change over the 12 year period. Comparative data for New Zealand is also included. Note that in Table 5.1, the employment: population ratio measures the proportion of each broad age group that is employed in either part-time or full-time employment. That is, the denominator is not the labour force as described above, but the population of each age *per se*.

The section then provides four scenarios projecting the labour force for the region, at territorial local authority level, for the period 2013-2063 (see Appendix F for data). All labour force projections proceed by applying a set of projected age and sex specific labour force participation rates to a projected population, in this case the baseline deterministic projections for each territorial local authority. Mathematically this can be stated, for each area, as;

$$LF_{it} = LFPR_{it} \times PPop_{it}$$

Where LF_{it} is the labour force at time t for age group i, $LFPR_{it}$ the projected labour force participation rate at time t for age group i and $PPop_{it}$ the projected population at time t for age group i. The projected age and gender specific labour force participation rates are chosen on the basis of the four scenarios outlined.

[5] The total usually resident, non-institutionalised, civilian population of New Zealand aged 15 years and over.

Table 5.1: Age specific labour force participation rates and employment: population ratios for the Waikato Region and New Zealand, 2001 – 2013

		15-24 years			25-44 years			45-64 years			65-74 years			75+ years			Total, 15+ years		
		2001	2013	Change 2001-2013 (%)	2001	2013	Change 2001-2013 (%)	2001	2013	Change 2001-2013 (%)	2001	2013	Change 2001-2013 (%)	2001	2013	Change 2001-2013 (%)	2001	2013	Change 2001-2013 (%)
Waikato Region	Employed Full-time	16,371	15,660	-4.3	59,685	57,339	-3.9	44,655	61,989	+38.8	2,406	6,747	+180.4	309	582	+88.3	123,429	142,320	+15.3
	Employed Part-time	9,891	9,813	-0.8	14,889	13,122	-11.9	11,157	14,727	+32.0	2,142	5,007	+133.8	744	1,620	+117.7	38,829	44,295	+14.1
	Unemployed	5,964	6,135	+2.9	5,778	5,421	-6.2	2,289	3,369	+47.2	66	183	+177.3	9	15	+66.7	14,100	15,126	+7.3
	Not in the Labour Force (LF)	15,354	20,598	+34.2	18,159	17,547	-3.4	17,157	18,216	+6.2	18,600	21,297	+14.5	16,356	22,137	+35.3	85,623	99,792	+16.5
	Work and LF Status Unidentifiable	1,305	3,144	+140.9	3,000	5,106	+70.2	2,310	4,395	+90.3	633	1,284	+102.8	441	699	+58.5	7,689	14,625	+90.2
	Working Age Population	48,885	55,350	+13.2	101,508	98,535	-2.9	77,574	102,693	+32.4	23,844	34,521	+44.8	17,859	25,047	+40.2	269,667	316,158	+17.2
	LF Participation Rate (%)	***67.7***	***60.5***	***-10.6***	***81.6***	***81.2***	***-0.4***	***77.2***	***81.5***	***+5.5***	***19.9***	***35.9***	***+80.7***	***6.1***	***9.1***	***+49.3***	***67.3***	***66.9***	***-0.6***
	Employment Rate (%)*	***55.2***	***48.8***	***-11.6***	***75.7***	***75.4***	***-0.4***	***74.2***	***78.0***	***+5.2***	***19.6***	***35.4***	***+80.5***	***6.0***	***9.0***	***+49.6***	***61.9***	***61.9***	***-0.1***

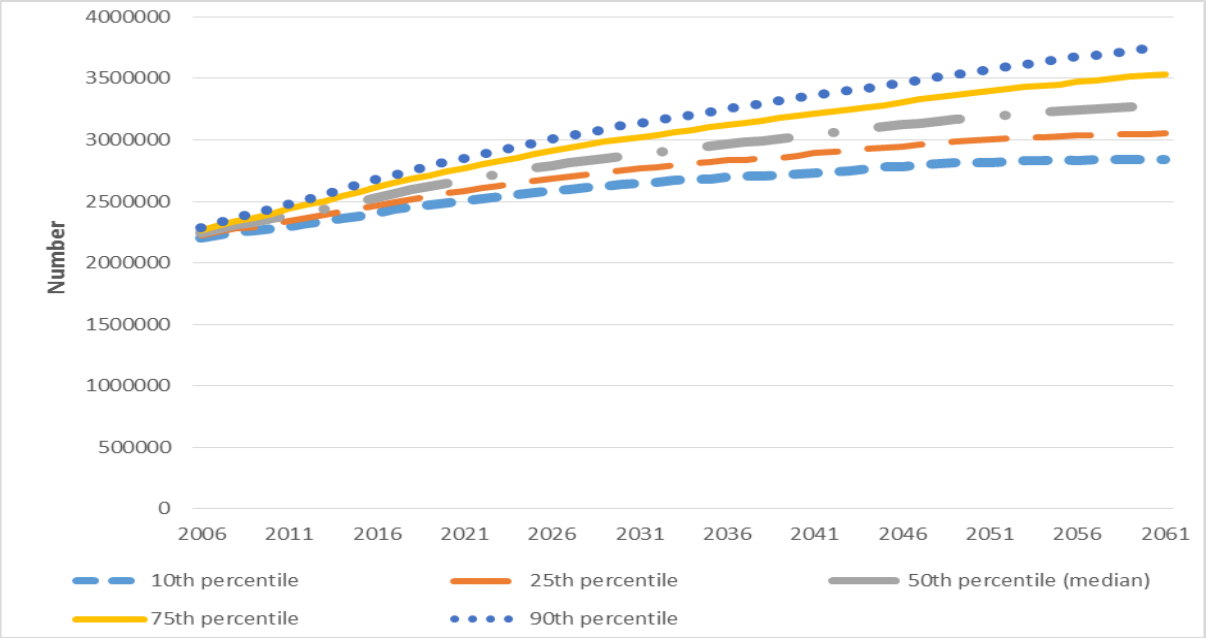
		15-24 years			25-44 years			45-64 years			65-74 years			75+ years			Total, 15+ years		
		2001	2013	Change 2001-2013 (%)	2001	2013	Change 2001-2013 (%)	2001	2013	Change 2001-2013 (%)	2001	2013	Change 2001-2013 (%)	2001	2013	Change 2001-2013 (%)	2001	2013	Change 2001-2013 (%)
New Zealand	Employed Full-time	168,987	163,488	-3.3	666,324	653,241	-2.0	469,383	655,680	+39.7	20,892	63,486	+203.9	2,532	5,169	+104.1	1,328,118	1,541,064	+16.0
	Employed Part-time	102,054	107,586	+5.4	153,984	136,791	-11.2	116,604	154,701	+32.7	19,827	47,382	+139.0	6,678	13,479	+101.8	399,147	459,939	+15.2
	Unemployed	56,409	61,302	+8.7	57,609	53,307	-7.5	25,080	36,339	+44.9	723	2,091	+189.2	90	174	+93.3	139,911	153,213	+9.5
	Not in the Labour Force (LF)	163,275	219,513	+34.4	195,627	186,201	-4.8	187,863	198,477	+5.6	197,535	219,477	+11.1	189,606	234,438	+23.6	933,906	1,058,106	+13.3
	Work and LF Status Unidentifiable	14,343	34,551	+140.9	35,715	58,428	+63.6	25,857	49,788	+92.6	7,194	13,698	+90.4	5,340	7,638	+43.0	88,449	164,103	+85.5
	Working Age Population	505,068	586,446	+16.1	1,109,259	1,087,959	-1.9	824,787	1,094,979	+32.8	246,171	346,134	+40.6	204,252	260,898	+27.7	2,889,537	3,376,416	+16.8
	LF Participation Rate (%)	***66.7***	***60.2***	***-9.7***	***81.8***	***81.9***	***+0.2***	***76.5***	***81.0***	***+5.9***	***17.3***	***34.0***	***+95.9***	***4.7***	***7.4***	***+59.0***	***66.7***	***67.1***	***+0.6***
	Employment Rate (%)*	***55.2***	***49.1***	***-11.1***	***76.4***	***76.7***	***+0.4***	***73.3***	***77.5***	***+5.7***	***17.0***	***33.4***	***+95.7***	***4.6***	***7.4***	***+59.0***	***61.7***	***62.3***	***+1.0***

** It should be noted that the Employment Rate is based on the total working age population aged 15 years or more (denominator for the Employment Rate calculation is the working age population of each age group and not the Labour Force)*

National Labour Force Projections Compared With Future Proof Labour Force Projections

Statistics New Zealand regularly prepare national labour force projections using a stochastic methodology. The last projection (2006(base)–2061 (August 2012 update)) is shown in Figure 5.1.

Figure 5.1: Projected labour force, 2006(base)-2061 (August 2012 update)



From these projections SNZ identify a number of broad trends in the projected labour force 2006-2061. Taking the median projection:

- The total labour force is projected to rise from an estimated 2.41 million at 30 June 2012 to 2.96 million in 2036 and 3.29 million in 2061,
- Labour force growth will slow in the future with annual growth falling from a projected 1.2 percent in the 2010s to 0.5 percent in the 2050s,
- The labour force is projected to continue to age with the median age of New Zealand's labour force rising from an estimated 41.8 years in 2011 to over 45 years in 2061.

The overall proportion of the projected population 15 years and over in the labour force is projected to decline from around 68 percent in 2011 to 65 percent in 2061.

Labour Force Scenario One

Scenario One assumes that 2013 labour force participation rates apply throughout the projection period. Essentially this serves as the baseline or business as usual scenario. The 2013 participation rates are shown in Table 5.2.

Table 5.2: Scenario One - labour force projections, 2013-2063

Year	Waikato District	Hamilton City	Waipa District	Total Future Proof Region
2013	34,618	78,438	25,279	138,335
2018	37,362	84,826	26,615	148,803
2023	39,909	90,424	27,629	157,962
2028	42,060	95,779	28,120	165,959
2033	43,816	100,292	28,085	172,193
2038	45,369	103,501	27,775	176,645
2043	46,817	105,768	27,375	179,960
2048	48,021	106,944	26,898	181,863
2053	48,687	107,094	26,275	182,056
2058	48,809	106,610	25,454	180,873
2063	48,738	105,968	24,454	179,160
Percentage Change (2013 - 2063)	***+40.8***	***+35.1***	***-3.3***	***+29.5***

Under Scenario One the Waikato District experiences a sizeable increase in the size of its labour force over the projection period, growing by 40.8 per cent. The work force begins to decline by the end of the projection period but this does not offset the projected increase for the period as a whole.

A similar trend is projected for Hamilton City. The workforce increases until 2053 and then begins to decline out to 2063. This decline does not offset the projected growth of the workforce (35.1 per cent) over the entire projection period.

A different trend is projected for the Waipa District as the workforce increases initially from 2013 but begins to decline much earlier than both the Waikato District and Hamilton City, from 2028. This steady decline continues to 2063 with negative growth at 3.3 per cent for the whole projected period, 2013-2063.

For the Future Proof sub-region in aggregate the labour force is projected to increase by 29.5 per cent with more rapid growth in the 2013-2033 period. However, the labour force is projected to decline from 2053 as the strong labour force growth in the Waikato District and Hamilton City slows and then ceases.

Labour Force Scenario Two

Scenario Two (Table 5.3) assumes that the labour force participation of prime age women increases over a twenty year period (2013-2033) so that half of the age specific 2013 gender gap in labour force participation is closed i.e. if the difference in labour force participation rates between the genders in a particular age group was six percentage points in 2013 this scenario assumes that the gap would have closed to three percentage points by 2033. For the period 2034 to 2063 labour force participation rates are held constant at 2033 levels. If the female labour force participation rate was higher than the male labour force participation rate in any age group the higher figure was used. This ensured that the labour force participation rate of females did not fall in any age group over the course of the projection. This was similar in intent to Bryant et al. (2004), who considered this issue at the national level.

Table 5.3: Scenario Two - labour force projections, 2013-2063

Year	Waikato District	Hamilton City	Waipa District	Total Future Proof Region
2013	34,618	78,438	25,279	138,335
2018	37,708	86,358	27,193	151,259
2023	40,697	93,811	28,929	163,437
2028	43,365	101,235	30,265	174,865
2033	45,662	107,994	31,095	184,751
2038	47,260	111,559	30,795	189,614
2043	48,754	114,115	30,295	193,164
2048	50,008	115,551	29,709	195,268
2053	50,773	115,905	29,039	195,717
2058	50,992	115,507	28,209	194,708
2063	51,000	114,816	27,165	192,981
Percentage Change (2013 - 2063)	***+47.3***	***+46.4***	***+7.5***	***+39.5***

As would be expected, increases in female labour force participation rates have a positive effect on the size of the labour force. Based on the assumptions entailed in this scenario, the positive effect of increased female labour force participation is significant, especially for the Waipa District, as the negative growth depicted in Scenario One is reversed and positive growth (7.5 per cent) is experienced over the entire projection period. The projected labour forces in this scenario are larger than those under Scenario One and both Hamilton City and the Waipa District enter decline later, from 2058 and 2053 respectively, while the Waikato District does not experience any decline before 2063. Growth in the Future Proof sub-region is notable at 39.5 per cent, however decline commences around 2053.

Labour Force Scenario Three

Scenario Three (Table 5.4) assumes that current increases in labour force participation rates amongst older workers continue out to 2033 before stabilising. Essentially this scenario assumes that over the twenty year period 2013-2033 the labour force participation rate profile of those older than the age group in which peak labour force participation occurs ages by five years i.e. in 2033 the labour force participation rates of 50-54 year olds will be equal to the participation rates of 45-49 year olds in 2013. In instances where this would result in a fall in the age specific participation rate the higher (previous) rate is used.

Table 5.4: Scenario Three - labour force projections, 2013-2063

Year	Waikato District	Hamilton City	Waipa District	Total Future Proof Region
2013	34,618	78,438	25,279	138,335
2018	37,948	86,074	27,174	151,196
2023	41,346	93,592	29,068	164,006
2028	44,588	101,543	30,718	176,849
2033	47,547	109,159	31,922	188,628
2038	49,328	113,479	31,732	194,539
2043	50,840	116,680	31,179	198,699
2048	52,202	118,768	30,602	201,572
2053	53,328	119,790	30,048	203,166
2058	53,947	119,954	29,429	203,330
2063	53,977	119,375	28,481	201,833
Percentage Change (2013 - 2063)	***+55.9***	***+52.2***	***+12.7***	***+45.9***

Changes in the age specific profile of labour force participation in this scenario have a greater impact on the size of the labour force than do the gender specific changes in Scenario Two. However, while the projected labour forces are larger, the overall pattern is unchanged from Scenario Two. Both Hamilton City and the Waipa District experience decline at the end of the projection period while the Waikato District experiences positive growth to 2063. For the Future Proof sub-region growth is significant at 45.9 per cent with the onset of decline delayed until 2058.

Labour Force Scenario Four

Scenario Four (Table 5.5) combines the assumptions of Scenario Two and Scenario Three. That is, it assumes both rising labour force participation, by workers aged 25 – 54 and in the older population, out to 2033 after which the participation rates stabilise. For males the labour force participation rate is assumed to rise over the twenty year period 2013-2033 so that the labour force participation rate profile of those older than the age group in which peak labour force participation occurs ages by five years (as in Scenario Three). For the female population the 2033 labour force participation rates are those used in Scenario Three aged by five years for those older than the age group in which peak labour force participation occurs.

Table 5.5: Scenario Four - labour force projections, 2013-2063

Year	Waikato District	Hamilton City	Waipa District	Total Future Proof Region
2013	34,618	78,438	25,279	138,335
2018	38,267	86,825	27,451	152,543
2023	42,076	95,264	29,693	167,033
2028	45,809	104,273	31,762	181,844
2033	49,293	113,058	33,439	195,790
2038	51,150	117,609	33,301	202,060
2043	52,702	120,973	32,721	206,396
2048	54,100	123,186	32,076	209,362
2053	55,274	124,317	31,465	211,056
2058	56,004	124,589	30,839	211,432
2063	56,126	124,049	29,893	210,068
Percentage Change (2013 - 2063)	***+62.1***	***+58.1***	***+18.3***	***+51.9***

While the overall size of the projected labour force is greater under this scenario than any of the other scenarios, the same general pattern from Scenarios Two and Three is evident. Both Hamilton City and the Waipa District are projected to experience decline from 2058 and 2033 respectively, with the onset of decline pushed out towards the very end of the projected period. For the Future Proof sub-region growth is significant at 51.9 per cent with the onset of decline from 2058.

Labour Force Projections – General Comments

The scenarios used to project the labour forces of the region seek to capture some of the drivers of changing labour force participation rates, namely changes in sex and age specific participation rates. The scenarios are based either on historical patterns, plausible behavioural responses to various policy shocks or a combination of the two. For instance there has been a long pattern of increases in female labour force participation rates over several decades (see Thévenon, 2013) and considerable responsiveness of labour force participation to changes in superannuation (Hurnard, 2005). What these projections cannot do, however, is offer much of a guide in the case of some large persistent shock that lies outside contemporary experience.

What can be drawn from the labour force projections is that for changes in sex and age specific labour force participation rates of the order of magnitude envisaged in these scenarios, the primary effect is on the size of the projected labour force rather than the pattern of development of a territorial local authority's labour force. The pattern of development of each territorial local authority's labour force under the four scenarios is shown in Figures 5.2 to 5.5.

Figure 5.2: Waikato District labour force projections, 2013-2063 (Scenarios One to Four)

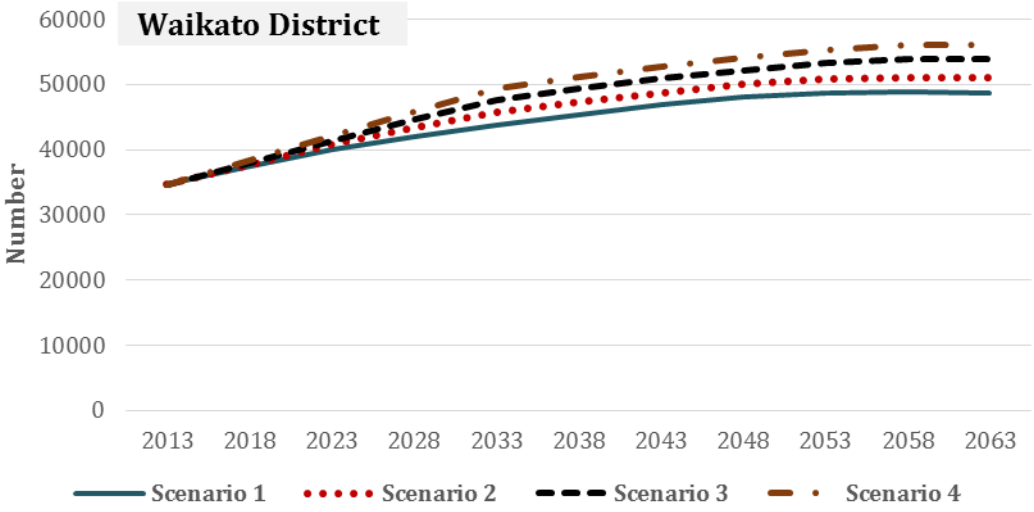


Figure 5.3: Hamilton City labour force projections, 2013-2063 (Scenarios One to Four)

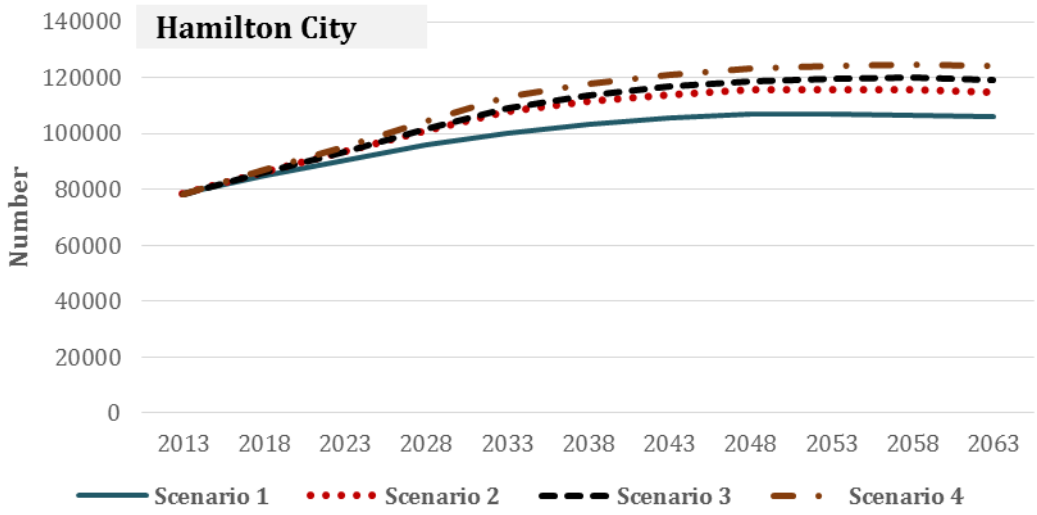


Figure 5.4: Waipa District labour force projections, 2013-2063 (Scenarios One to Four)

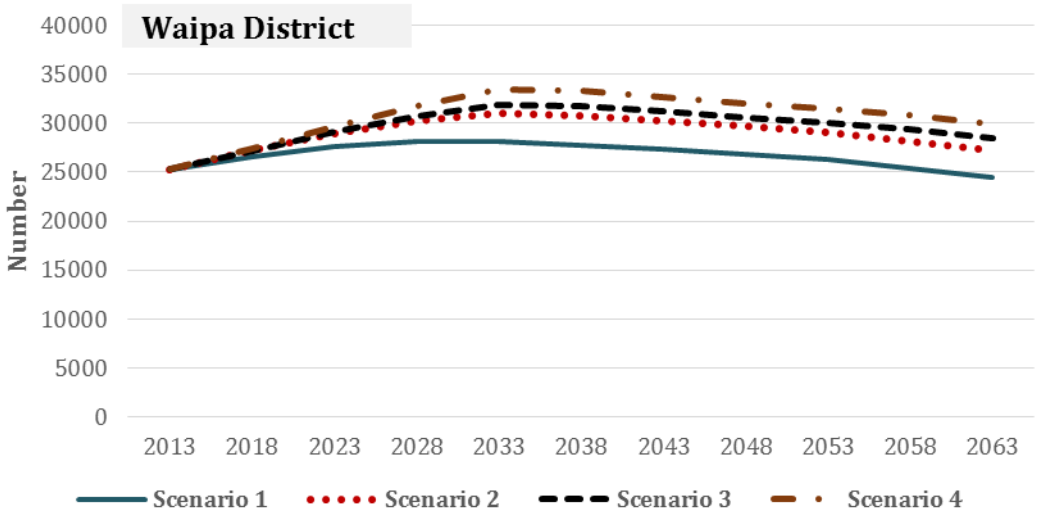
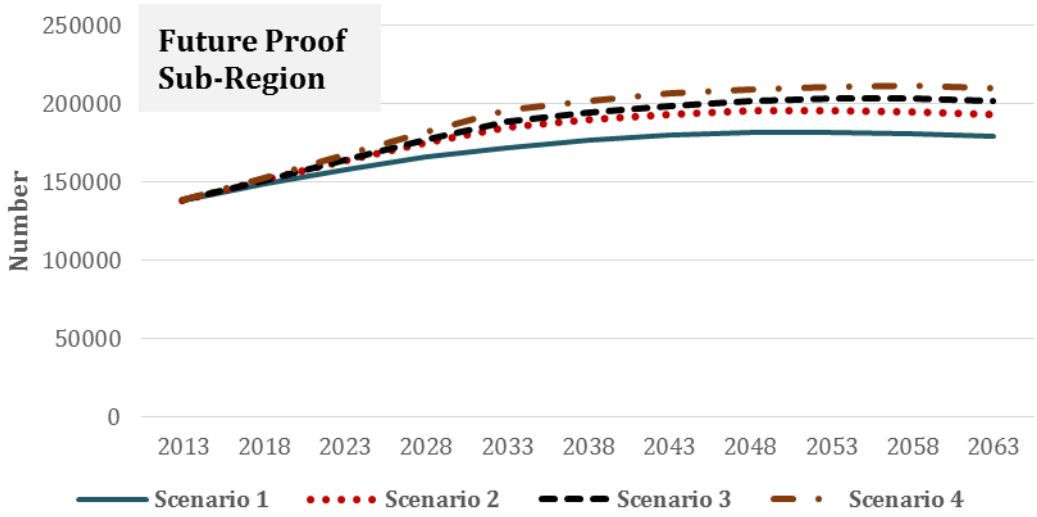
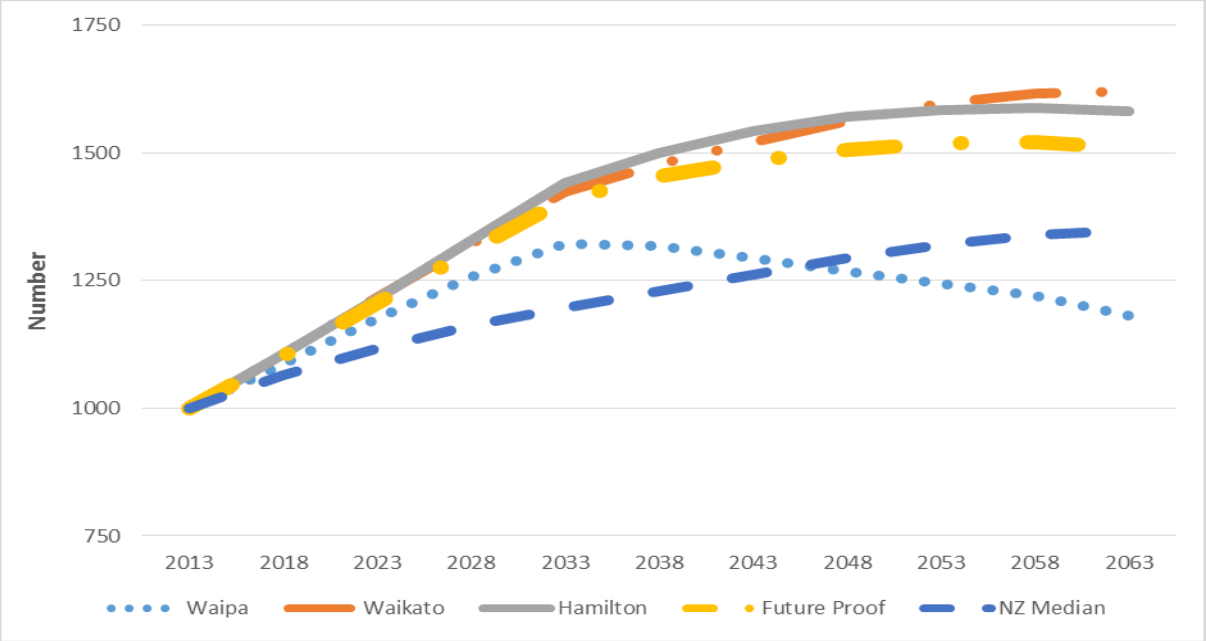


Figure 5.5: Future Proof sub-region labour force projections, 2013-2063 (Scenarios One to Four)



The picture of the projected (median) development of New Zealand's labour force outlined in Figure 5.1, an ageing labour force with slowing growth, is consistent with the earlier discussion of the projected development of the labour force of the Future Proof sub-regions. However, the projected growth of the labour force of the Future Proof sub-regional TAs (2013-2063) under Scenario Four, is consistently above the projected national median level for the Waikato District and Hamilton City, though this divergence slows at the end of the projection period (Figure 5.6).

Figure 5.6: Projected labour force growth 2013-2063 Future Proof sub-region (Scenario Four) and New Zealand (median projection), 2013=1000



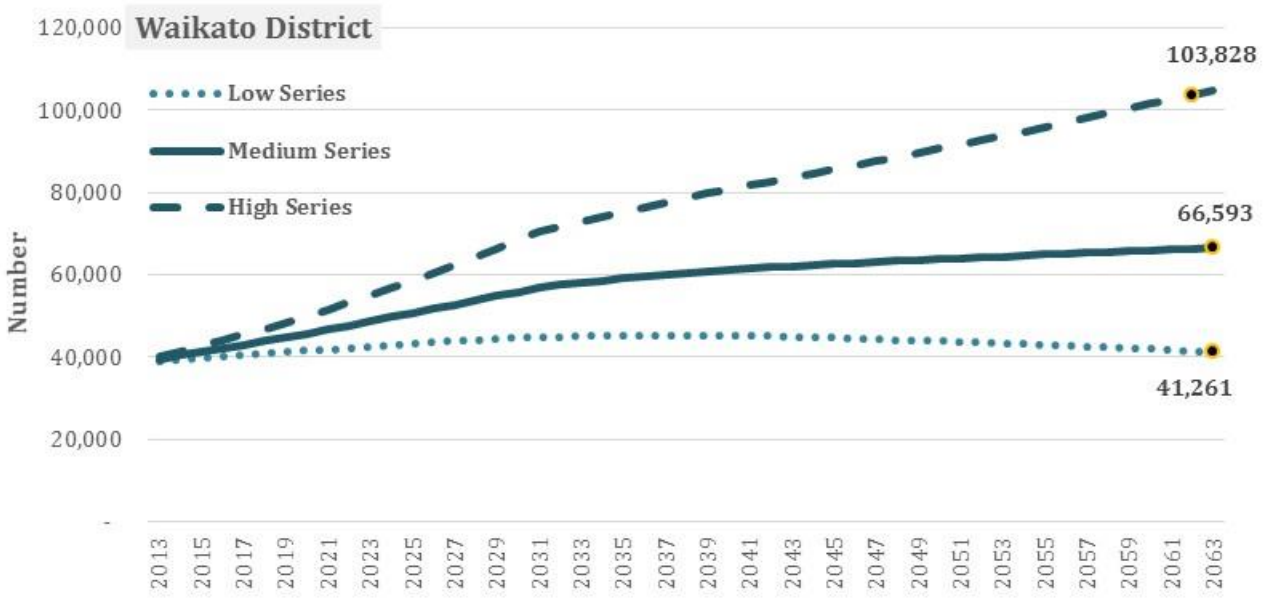
In general we are of the view that the most likely scenario to be adhered to by the labour force over the projection period is that of Scenario Four, i.e., the labour force will see further increases in the labour force participation of both prime-aged women and older people. This being the case any further labour market work associated with these projections will proceed on the basis of Scenario Four.

6. Motor Vehicle Projections

This section presents the projected number of motor vehicles based on the projected population for each TA in the Waikato sub-region, which is then multiplied by projected car ownership rates based on 2009 observed rates (New Zealand Transport Authority, 2009).

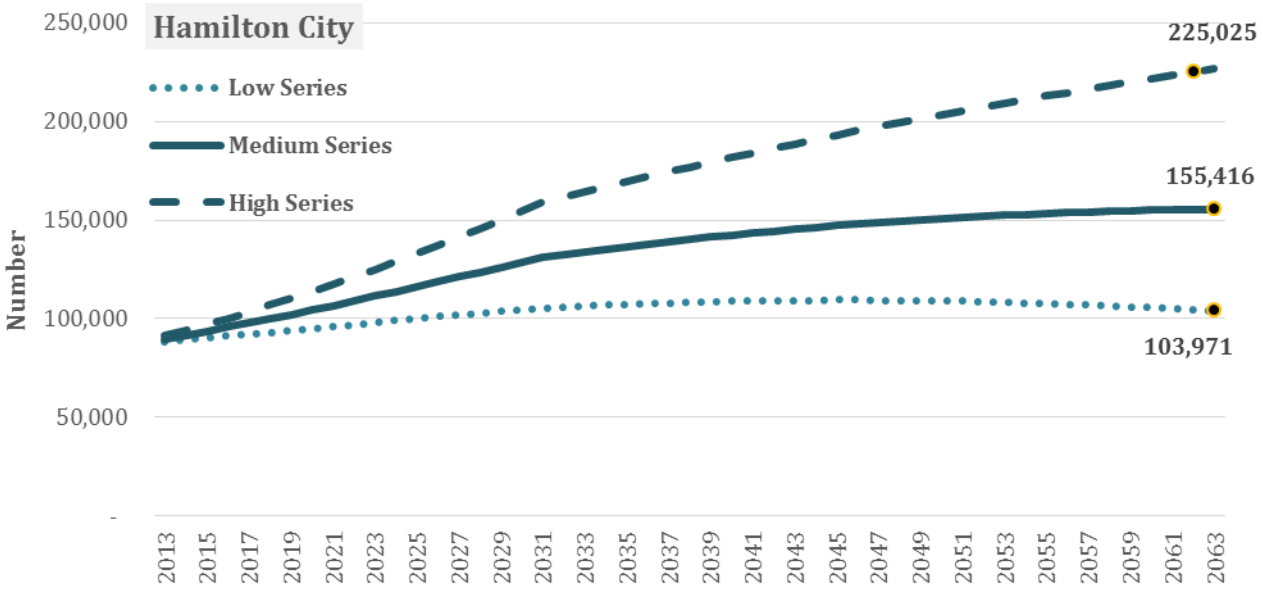
For the Waikato District (Figure 6.1), the number of motor vehicles is projected to increase for both the medium and high series and to decline under the low series by 2063. Under the medium series, the number of motor vehicles is projected to increase from 39,556 (2013) to 58,078 by 2033 (+46.8 per cent) and to 66,593 by the end of the projection period, an increase of 14.7 per cent from 2034. As would be expected, numbers under the high series are projected to increase quite considerably over the whole projection period, by around 161 per cent, while the low series projection is more moderate, increasing by only 2,315 vehicles (or +5.9 per cent) 2013-2063, with negative growth from 2038 (see Appendix G-1 for data).

Figure 6.1: Motor vehicle projections, Waikato District 2013-2063



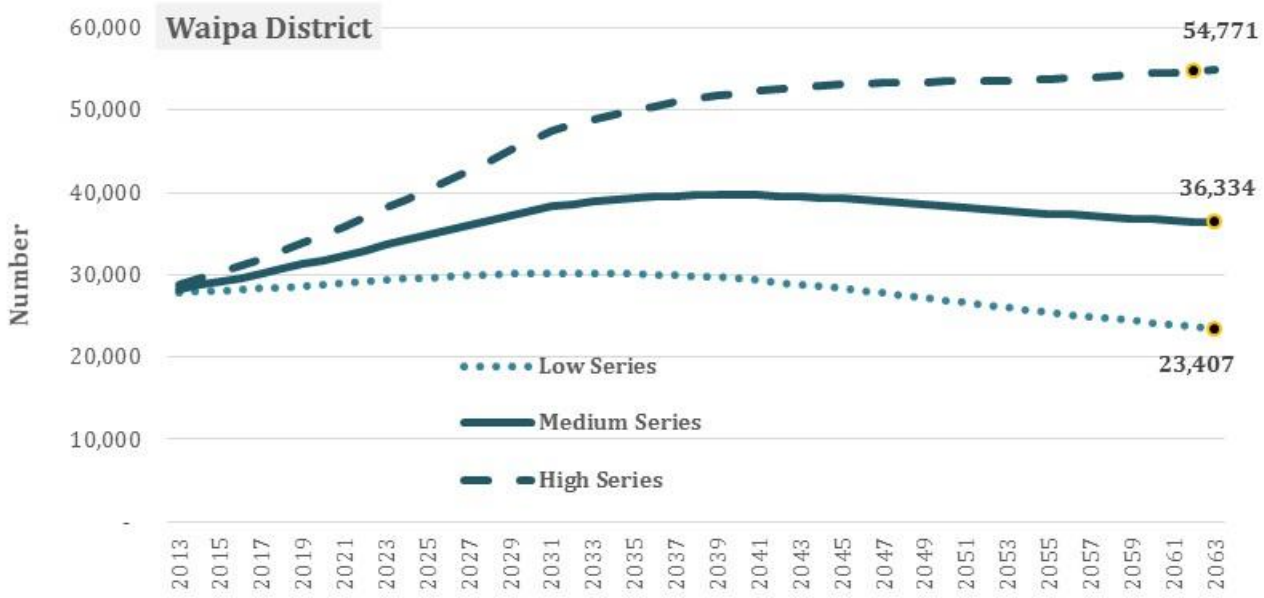
Similar trends are projected for Hamilton City (Figure 6.2), with both the medium and high series projections indicating an increase in motor vehicle numbers over the whole projection period. The medium series projections indicate growth of around 49.2 per cent (an additional 44,144 motor vehicles) over the 2013-2033 period. In the latter projection period, growth begins to slow for both the high and medium series projections, while the low series projections indicate negative growth from the late 2040s (-2.3 per cent) (see Appendix G-2 for data).

Figure 6.2: Motor vehicle projections, Hamilton City 2013-2063



For the Waipa District, the medium and low series projections indicate an initial increase in vehicle numbers across the projection period 2013-2033, but move into decline during the later projection period, 2033-2063. The medium series projections indicate an increase of 37.5 percent in the number of motor vehicles across the projection period 2013-2033. Growth slows and declines across the second part of the period (-6.5 per cent) although not enough to offset the earlier growth, ending the period at +28.5 per cent for 2013-2063. Under the low series projections, the number of vehicles is expected to decline quite considerably over the whole projection period 2013-2063, from 27,840 to 23,407 (-15.9 per cent) with negative growth likely to begin around 2033. Under the high series projections, growth remains steady out to 2063, increasing by 91 per cent over the whole projection period (see Appendix G-3 for data).

Figure 6.3: Motor vehicle projections, Waipa District 2013-2063



7. Key Trends and Determinants Affecting Future Population Change

Across the next several decades, New Zealand will face significant demographic challenges—and opportunities, some in common with other countries, such as population ageing and the end of growth/onset of depopulation in many subnational areas, and some unique, such as the disproportionate concentration of the nation's population in one region (Auckland), the relative youthfulness of the Anglo-Settler countries' largest indigenous population (Maori), and a rapidly changing ethnic composition generated by globally high per capita net international migration gains. These intertwining factors are considered below under five broad headings: Global Demographic Forces; Population Ageing; Regional Diversity; Workforce Ageing, and Population (Ethnic) Composition, with comment on their implications for the foregoing projections.

With 14.3 per cent aged 65+ years in 2013, the Waikato Region is almost identical in age structure to the national population (14.2 per cent). Both age structures have a shallow 'bite' over the key reproductive ages 25-40 years, caused in part by intermittent net migration loss at young adult ages (much less so for Hamilton City than its counterpart TAs), and in part by lower fertility rates when people currently at those ages were born. The bite contributes to an increase in the median age (structural ageing) and also reduces the potential number of births, further contributing to structural ageing.

As this Report has identified, only the Waipa District currently has an age structure that is older than the national average. However by 2033 both the Waipa and Waikato Districts are projected to have proportions aged 65+ years above the national average (21.3 per cent), while Hamilton City will have drawn level with the national average.

As the trends outlined unfold, all territorial authorities and the region in general will experience increasing competition from other regions (and countries) for their young. If young people leave in greater proportions than assumed in the projections, and/or greater proportions of older people move in, the region's structural ageing – and that of its territorial authorities - will accelerate, as will depopulation in those territorial authorities in which it is projected.

A reduction in both net migration loss at younger ages and net migration gain at older ages would slow these projected outcomes, as would a rise in the birth rate, but for most territorial authorities of the Waikato Region this will only delay the incremental shift to the end of growth/onset of depopulation (as in the case of the Waipa District), a situation that is already common at subnational level across both New Zealand and New Zealand's counterpart countries (and nationally across much of Europe, and Japan), and is foreshadowed in global demographic trends.

Global Context

Between 2011 and 2031, the 58 More Developed Countries (MDCs) enumerated by the United States Census Bureau's International Database (IDB) are projected to grow by less than 5.0 per cent (United States Census Bureau). At 65+ years, growth will be approximately 49 per cent, adding around 100 million 65+ year olds to the current 200 million at these ages. All other age groups 0-64 years are projected to decline by around 41 million (-3.9 per cent).

Developing countries are also beginning or are well into the structural ageing process, with the currently-largest, China, expected to reach the end of natural growth in 2026. Accounting for over 20 per cent of the global population, China's shift to natural decline will have a marked impact on the global growth rate, which at just over 1.0 per cent per annum is now half of what it was in the 1980s, and is expected to be below 0.5 per cent per annum by mid-century (United States Census Bureau IDB). The global fertility rate is now around 2.4 births per woman, also below half of what it was in the 1950s (5.4 births per woman), and only marginally above the replacement level fertility rate of 2.1 births per women (Wilson 2001). Globally, population growth is projected to end around the end of the present century (Lutz, Sanderson and Sherbov 2004; Reher 2007).

Implications for the projections: The global trends provide both New Zealand and the Waikato Region with a salutary warning. The diminishing pool of youth in the other 57 MDCs is the pool within which New Zealand competes for many of its skilled migrants. Increasing competition for these migrants (United Nations 2000) - within and between countries, regions and industries - will make it increasingly difficult for New Zealand (and the Waikato) to achieve its desired migration targets. Attention is increasingly turning to the developing countries where there is still – and will remain for the foreseeable future - a significant excess supply of young people. However, attracting them to, and retaining them in New Zealand/Waikato will require more attention to settlement issues, including where migrants might most usefully settle, and education and equity in terms of the recognition of equivalent qualifications. As one of the youngest of the developed countries, those migrants who New Zealand attracts *and trains* will be of ever-greater interest to our structurally older counterparts – as will young New Zealanders themselves, including young people from the Waikato Region and particularly Hamilton City.

Population Ageing

Population Ageing

New Zealand has a relatively youthful population, with 14.2 per cent aged 65+ years in 2013 compared to 16.8 per cent average for the 58 More Developed Countries referred to above. However as elsewhere, New Zealand's population is also ageing numerically, as more people live longer, and structurally, as low birth rates cause the increased numbers of elderly to also increase as a proportion. The number of New Zealanders aged 65+ years is projected to more than double by 2031, from around 615,000 at present to 1.2 million, and to 1.5 million by 2061, while the proportion aged 65+ years will increase from its present 14.2 per cent to around 21 per cent by 2031, and 26 per cent by 2061[6]. These trends mean that while the New Zealand population will continue to grow for the foreseeable future, reaching around 5,200,000 by 2031 (+18 per cent over 2011), two-thirds of that growth will be at 65+ years.

Implications for the projections: The trends for the Future Proof sub-region described in this Report are entirely consistent with national picture, and indicate that there will be little departure from them; if anything, parts of the sub-region, such as Waipa, may gain more at older ages from other New Zealand regions than indicated by the projections, if the historical rates of net inflow at older ages increases.

Demographic Drivers

As has been outlined in this Report, population ageing is unfolding at markedly different rates across New Zealand. This diversity is caused by different mixes in the drivers of population ageing: birth rates, longevity (survivorship) and migration (e.g., Jackson 2007):

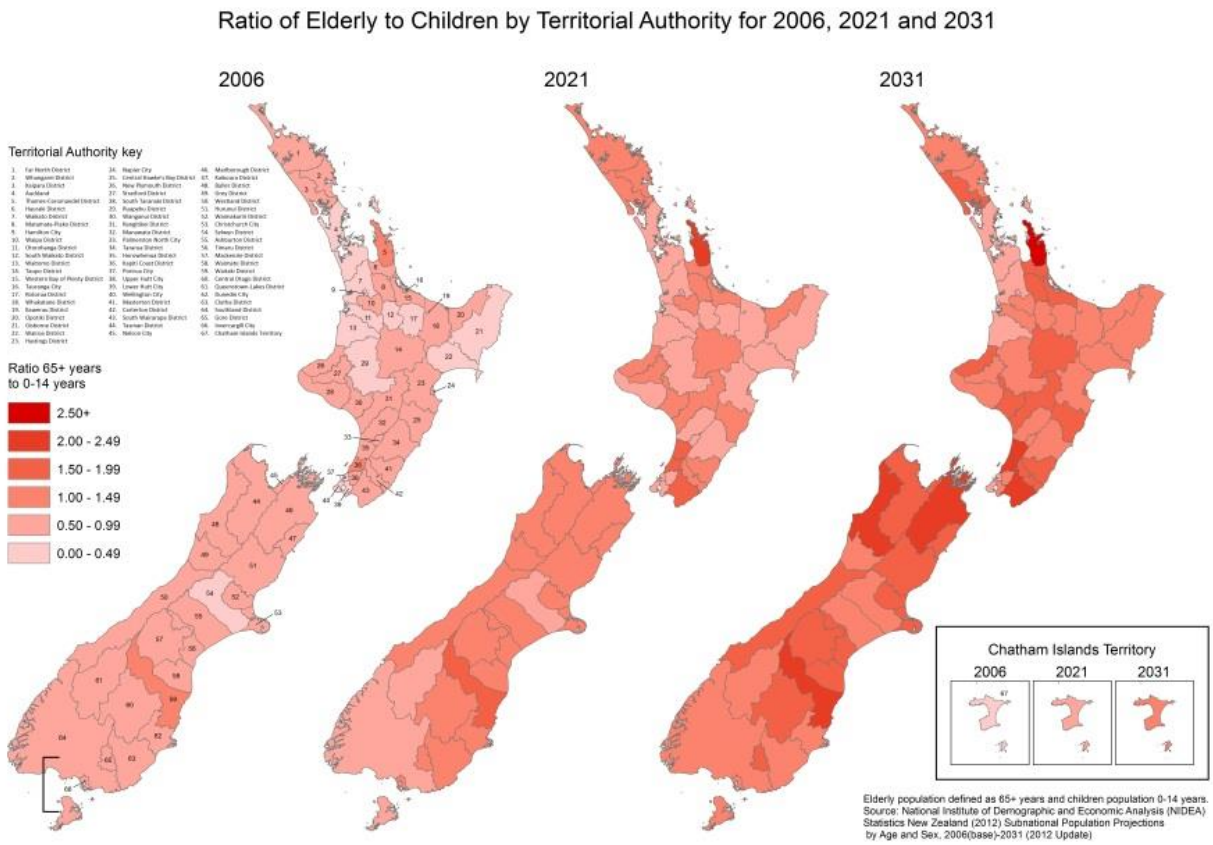
- Declining birth rates decrease the proportion of the population that is young and concomitantly increase the proportion at older ages (known as structural ageing).
- More people living longer adds to the numbers at older ages (numerical ageing), and in the process further swells the proportion at those age (structural ageing is accelerated).
- When an area experiences net migration loss, which occurs mainly at 20-39 years, it removes both the young people themselves and their reproductive potential, further pushing up the median age (structural ageing is further accelerated).
- Where an area experiences net migration gains at retiree ages, both the numbers and proportions at those ages are further augmented, further accelerating structural ageing.

[6] All projections referred to here are based on Statistics New Zealand (2012) medium case (50th percentile) assumptions. At national level these are: an international net migration gain of 12,000 per year from 2015 and then remaining constant; the Total Fertility Rate falling to 1.9 births per woman by 2036 and then remaining constant; and life expectancy at birth increasing by 2061 to 88.1 and 90.5 years for males and females respectively.

The overall outcome of these processes is an incremental—and in some cases rapid—shift to more elderly than children, more deaths than births, and to the end of growth and onset of what is expected to be permanent population decline, something not seen in modern populations until its recent onset in Japan and much of Europe.

Figure 7.1 provides a national overview of the first of these trends (more elderly than children) for New Zealand at territorial authority level. In 1996, no territorial authority had more elderly than children. By 2006 that had become three territorial authorities (4.5 per cent); by 2021 it is projected to be the case for 41 territorial authorities (61.2 per cent); and by 2031, for 61 territorial authorities (91.0) per cent. Supporting these projections, the June 2013 Estimated Resident Population data indicate that 15 territorial authorities (22 per cent) now have more elderly than children. None of the Future Proof sub-region's TAs are currently among them; however the cross over to more elderly than children is projected to occur for the Waipa District around 2021 and before 2033 for both Waikato District and Hamilton City.

Figure 7.1: Ratio of elderly (65+ years) to children (0-14 years), 2006, 2021 and 2031



Implications for the projections: The shift to more elderly than children in the three TAs of the Future Proof sub-region as shown in this Report is entirely consistent with national trends, indicating that there is likely to be little departure from the projected situation.

Ageing-Driven Growth

Between 2011 and 2031, the trends will see the majority of growth in 56 (84 per cent) of New Zealand's 67 TAs occur at 65+ years. In 33 territorial authorities (nationally), that growth will offset decline in most other age groups (as will be the case for the Waikato District), but in 23 TAs it will be insufficient to prevent overall decline (as will be the case for the Waipa District).

Nationally only 17 TAs (25 per cent) are projected to see growth at 0-14 years across the period 2011-2031 (among them the Waikato District), and 23 (34 per cent) at 15-39 years (among them both the Waikato District and Hamilton City). In all other TAs (including the Waipa District), numbers at these ages are projected to decline. At regional council level, only Auckland is projected to see an increase in numbers aged less than 39 years.

Implications for the projections: The impact of structural ageing on the TAs of the Future Proof sub-region indicated in this Report is consistent with national trends at territorial authority level. One factor that could make a difference for the Waikato Region and Hamilton City in particular would be an expansion of the activities of the University of Waikato and WinTec. Such developments would plausibly see greater retention of some young adults seeking higher education. However the situation of Hamilton City suggests that young people still move away once they have completed their studies, the city typically experiencing a net migration loss at 20-24 years of age (see Appendices A-1 and A-2).

Regional Diversity

Geographic Mal-Distribution of the Population

While Auckland currently accounts for one-third of New Zealand's population, the region's share of annual growth is projected to increase from just over 50 per cent between 2006 and 2013 to two-thirds by 2031, taking Auckland's share of the national population to 38 per cent. Of the remaining regional council areas, only Canterbury is projected to see an increase in population share, driven largely by the rebuild of Christchurch and related immigration. Other regions will also continue to grow, but at a decelerating rate. Data from the 2013 Census supports these projections, showing that between 2006 and 2013, Auckland and 11 of New Zealand's 12 cities accounted for 75 per cent of growth, with the remaining growth spread thinly across 30 districts, while 20 districts failed to grow or declined. Only 5 districts each gained more than 2 per cent of growth.

Implications for the projections: The spatial changes in projected population share indicated in this Report for the Future Proof sub-region and its territorial authorities, i.e. an increasing concentration of both the total population, and all broad age groups, in Hamilton City, are consistent with the national picture of concentrating growth in large urban areas. It is not possible to comment on the extent to which the sub-region, and Hamilton City in particular, could see an increase in share of the national population above what is projected, but the overall trends suggest that any increase would most likely be at older ages.

The Subnational Ending of Population Growth

The different rates of natural increase, migration and population ageing across the country are ushering in the permanent end of growth for many regions—a trend which has to be understood in the broader context of global population ageing noted above. Between 2011 and 2031, 23 territorial authorities (34 per cent) are projected to experience absolute decline, among them Waipa District. This is a similar proportion to that for the period 1996-2011.

Supporting the proposition, Figure 7.2 provides a snapshot of observed changes in the Usually Resident Population (URP) for the Waikato Region at Census Area Unit (CAU) level for the two periods 2001-2006 and 2006-2013. The URP of the Waikato Region grew at 0.9 per cent per annum between 2006 and 2013, identical to the annual average ERP change (forthcoming adjustments to the URP for persons temporarily overseas on census night and census night undercount may alter the picture slightly). The growth was disproportionately shared by the CAUs of the Waipa District (90 per cent of CAUs growing between 2006 and 2013), Waikato District (83 per cent) and Hamilton City (72 per cent). At the same time, over one-third of the region's 194 CAUs (69 CAUs, 36

per cent) declined in size, and, as also occurred nationally, the decline was more widespread than between 2001 and 2006, when 56 of the region's CAUs declined (29 per cent). Table 7.1 shows that between 2006 and 2013 the greatest proportion of CAUs declining was in the Thames-Coromandel District (7 of 10 CAUs; 70 per cent) followed equally by South Waikato (10 of 16 CAUs; 63 per cent) and Hauraki District (5 of 8 CAUs; 63 per cent).

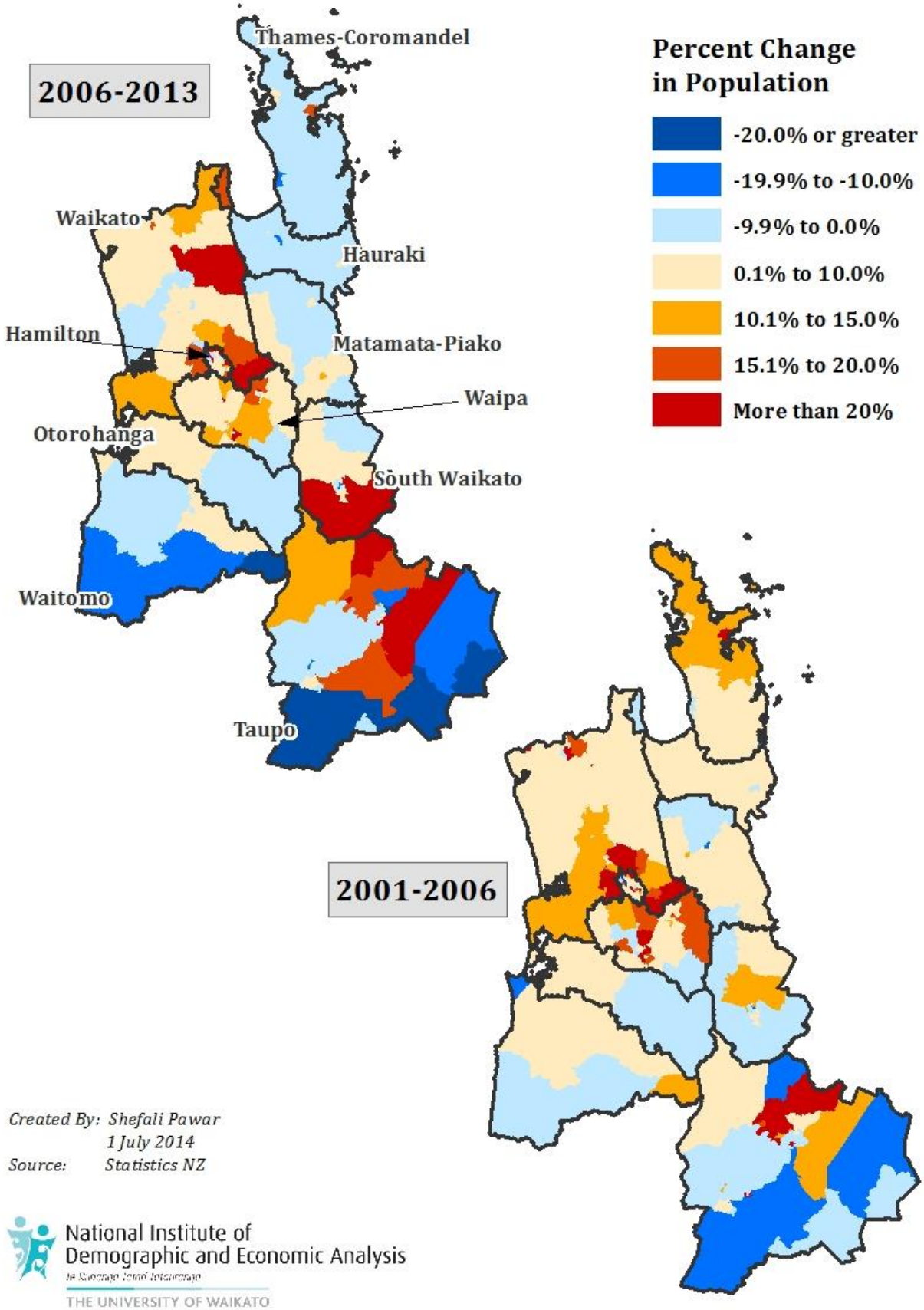
Table 7.1: Change at CAU level, 2001-2006 and 2006-2013, TAs of the Waikato Region,

Territorial Authority (TA)	Number of CAUs*	Population Change 2001-2006				Population Change 2006-2013			
		Growth		Decline		Growth		Decline	
Hamilton City	46	38	*(83%)*	8	*(17%)*	33	*(72%)*	13	*(28%)*
Hauraki District	8	6	*(75%)*	2	*(25%)*	3	*(38%)*	5	*(63%)*
Matamata-Piako District	13	9	*(69%)*	4	*(31%)*	8	*(62%)*	5	*(38%)*
Otorohanga District	5	2	*(40%)*	3	*(60%)*	3	*(60%)*	2	*(40%)*
South Waikato District	16	5	*(31%)*	11	*(69%)*	6	*(38%)*	10	*(63%)*
Thames-Coromandel District	10	6	*(60%)*	4	*(40%)*	3	*(30%)*	7	*(70%)*
Waikato District	30	27	*(90%)*	3	*(10%)*	25	*(83%)*	5	*(17%)*
Waipa District	29	25	*(86%)*	4	*(14%)*	26	*(90%)*	3	*(10%)*
Waitomo District	8	5	*(63%)*	3	*(38%)*	2	*(25%)*	6	*(75%)*
Taupo District	29	15	*(52%)*	14	*(48%)*	16	*(55%)*	13	*(45%)*
Waikato Region	**194**	**138**	***(71%)***	**56**	***(29%)***	**125**	***(64%)***	**69**	***(36%)***

** Only CAUs with usually resident population of more than 10 in either of the three Census years, 2001, 2006 and 2013 are included.*

Implications for the projections: The observed trends at CAU level for the three TAs of the Future Proof sub-region across the periods 2001-2006 and 2006-2013 are relatively positive when compared with those of the rest of the Waikato Region and much of New Zealand. They support the projections of continued growth for the Waikato District and Hamilton City presented in this Report, but also provide some insight into why the projections for Waipa indicate decline in the second half of the projection period: the TAs experiencing the greatest percentage of CAUs declining are the Waikato Region's oldest (Thames-Coromandel followed by Hauraki and the South Waikato).

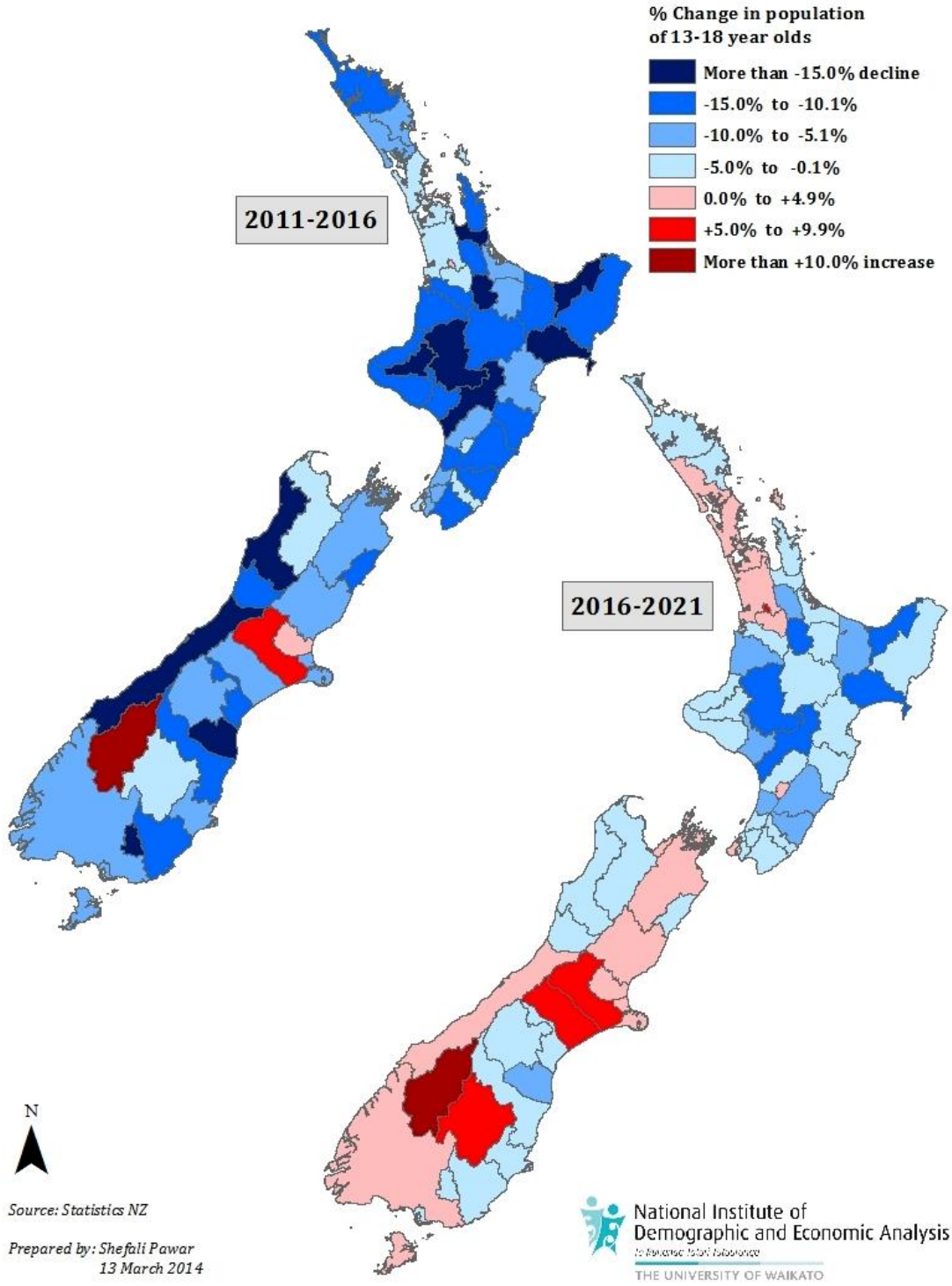
Figure 7.2: Percentage change in the Usually Resident Population of Census Area Units (CAU), 2001-2006 and 2006-2013: Waikato Region



Age structural transitions

The trends are also generating significant oscillations in the numbers (and proportions) in each age group, and these have significant implications for a broad range of factors, among them policy development, the delivery of services, and the size of the labour force. For example, while the number of New Zealanders aged 65+ years will grow at an accelerating annual rate until the late 2020s, the annual increment will then begin to reduce. At the other end of the age spectrum, New Zealand is facing a decline of some 20,000 school-leavers over the present five year period (2011-2016), and a further 8,000 the following five years, the legacy of falling birth rates during the 1990s. Around 2021, school-leaver numbers will again surge, albeit only temporarily, as a recently born baby blip reaches those ages. In the interim, this extended cohort will work its way through New Zealand's schooling system, generating waves and troughs as it passes through each age group (Figure 7.3). However as Figure 7.3 also indicates, the resurgence will be geographically patchy, and only Hamilton City is expected to see a notable return to growth at these ages (on these SNZ projections, the Waikato and Waipa Districts see a minor return to growth at 13-18 years between 2016 and 2021 of 0.4 and 1.3 per cent respectively).

Figure 7.3: Projected change (%) at 13-18 years by TA, 2011-2016 and 2016-2021



Workforce Ageing and Participation Rates

These demographic trends are causing New Zealand's workforce to age quite rapidly. The prime working age population aged 15-64 years has recently peaked at 66 per cent of the population and is projected to shrink to 60 per cent by 2031 and 58 per cent by 2061. The ratio of those in the

general population at labour market entry age (15-24 years) to those in the main retirement zone (55-64 years) has fallen from 18 per 10 in 1996 to 13 per 10 today. The trend is even more profound in the employed workforce, which by 2013 had just 6 people at entry age (15-24 years) for every 10 in the retirement zone (55+ years), down from 16 per 10 in 1996.

Notably, these low ratios are occurring despite a trebling of labour force participation at 65+ years across the period 1986-2011. In both 2011 and 2012 New Zealanders recorded the second highest employment to population rates in the OECD at 55-64 years and fourth highest at 65-69 years. The Waikato Region is part of this trend, with the employment rate (employment to population) for those aged 60-69 years increasing from 38.8 per cent in 2001 to 54.7 per cent in 2013, 71 per cent of that employment in 2013 being full-time employment (up from 67 per cent in 2001). Employment rates are lower at 70-79 years (19 per cent in 2013), but have nevertheless almost doubled since 2001, and those at 80+ years have increased by 50 per cent.

The declining labour force entry: exit ratios are particularly pronounced in key industries. Here we use a ratio of those aged 15-29: 55+ years to allow for the gaining of appropriate qualification levels in some industries/occupations. In 2013, New Zealand's single-largest industry at three-digit level (School Education) had just 4 people at entry age (15-29 years) for every 10 in the retirement zone (55+ years), down from 11 per 10 in 1996; and the second-largest industry, Government Administration, just 6 per 10, down from 19 per 10 in 1996.

The Waikato Region's two largest industries are Dairy Cattle Farming and School Education. Dairy Cattle Farming has a similar age structure to that of the total employed workforce, with just under 10 people at entry age in 2013 for every 10 in the retirement zone (down from 20 per 10 in 1996). By contrast the School Education Industry had just 4 people at labour force entry age per 10 in the retirement zone, down from 12 per 10 in 1996.

Implications for the projections: Labour force participation at 60+ years in both New Zealand and the Waikato Region is already relatively high in global terms, suggesting that employment rates at these ages are unlikely to undergo further dramatic increase. The declining ratio of labour market entrants to exits may on the other hand see a decline in unemployment rates, especially at younger ages; however unemployment rates (and thus those currently unemployed) are included in labour force projections. These trends suggest that in numerical terms the future workforces of the Future Proof sub-region and its territorial authorities are unlikely to greatly exceed those indicated in Scenarios Three and Four.

Population (Ethnic) Composition

Diminishing Role of Natural Increase

Despite New Zealand's reputation as a country of high international immigration, the primary driver of growth remains natural increase (the difference between births and deaths), and this is the case even for the peak international migration destination of Auckland. However as population ageing progresses, natural increase will diminish, becoming negative in 16 territorial authorities (23 per cent) by 2031 (compared with just one at present); the Waipa District will join this group around 2036 and Hamilton City around 2059. In areas where there is both net migration loss of people of reproductive age and net gain at older ages, as is the case for the Waipa District, and even for Hamilton City to an extent, natural increase has the potential to decline quite rapidly. Nationally, only two territorial authorities, Selwyn and Auckland, are expected to see growth in their natural increase component across the period.

Implications for the projections: The trends described in this Report are consistent with the national picture at territorial authority level and thus unlikely to differ markedly from the projected situation. However, if young Maori became less likely to leave the region, their higher than average birth rates would assist in keeping natural increase relatively high for a longer period.

Increasing Role of Migration

Although regionally differing birth rates and life expectancy are involved, New Zealand's subnational diversity is primarily driven by differences in migration trends and patterns. Where net migration is negative, the loss is mostly concentrated at the key reproductive ages, 20-39 years; this removes both the young people and their reproductive potential, and accelerates structural ageing. Between 2011 and 2031, 33 territorial authorities (49 per cent) are projected to experienced sustained net migration loss. The Waipa District almost joins them around 2050, but net gain then resumes. By contrast, net migration gains at retiree ages are projected to continue for many coastal sun-belt areas, such as Northland, the Bay of Plenty (particularly Western Bay of Plenty and Tauranga), Kapiti Coast and Marlborough. The Waipa District also experiences this phenomenon. Gains at these ages add to the increased numbers deriving from longer life expectancy, and further increase the proportions at older ages. In some cases, such as for the Waipa District, the joint effects of migration loss at younger ages and gains at older ages (from both increased longevity and migration) will accelerate the shift to natural decline, at the same time as the population initially grows.

Implications for the projections: As natural increase declines, it is likely that the New Zealand Government will increase both its migration targets and its activities in attracting international migrants. Any increase in international migration could see an increase in ethnic diversity for the Waikato Region and especially for Hamilton City. However as structural ageing increases, migrants will increasingly replace natural increase (i.e. offset natural decline), rather than greatly augment and grow the population.

Ethnic Diversity – Demographic Contribution of Maori

New Zealand is rapidly transitioning from a predominantly European-origin population to a multi-ethnic society, although this trend differs markedly by region. In 1996, New Zealand's European-origin population accounted for 82 per cent of the population; by 2026 it is projected to account for 62 per cent, and for just half of all children (0-14 years), down from 77 per cent in 1996. Sub-nationally, 52 per cent of Auckland's growth 2011-2021 is projected to come from its Asian population, and 25 per cent from its Pasifika population, compared with 25 and 15 per cent respectively elsewhere in New Zealand, while the European-origin population will account for just 15 per cent of Auckland's growth and 34 per cent elsewhere.

The age structures of each ethnic group also differ markedly, with the 2013 Census median age of the European-origin population (nationally) 41 years of age and that for Maori and Pacific Island populations just 24 and 22 years respectively. People of Asian origin fall somewhere between these extremes, with a median age of 31 years. These differences disproportionately expose each population to different life course 'risks', such as seeking education, beginning family formation, and entering the labour market for the younger populations. However they also present New Zealand – and the Waikato Region particularly - with a unique opportunity as the older European-origin population disproportionately retires. Over the next two decades, young Maori and Pacific adults will together account for around one-third of the nation's labour market entrants, and young people of Asian-origin will swell that to almost half. This potential demographic dividend arising from the Maori age structure is notable for the Waikato Region with its somewhat greater than average proportion of people of Maori origin (18.5 per cent compared with 14.1 per cent nationally). Both the Waikato District and Hamilton City also have higher than national proportions at 20.3 and 17.9 per cent respectively, while just 12.1 per cent of the Waipa District population is Maori.

Implications for the projections: As structural population unfolds, the Waikato District and Hamilton City will have some advantages over other TAs because of their relatively high proportions of Maori. Strong affiliation to whanau and turangawaewae may see young Maori less desirous of moving than non-Maori. Employment opportunities opening up with the ageing and

retirement of the disproportionately older European-origin population could see young Maori encouraged to remain in the region and thus reduce the negative age-specific migration rates underlying the population projections.

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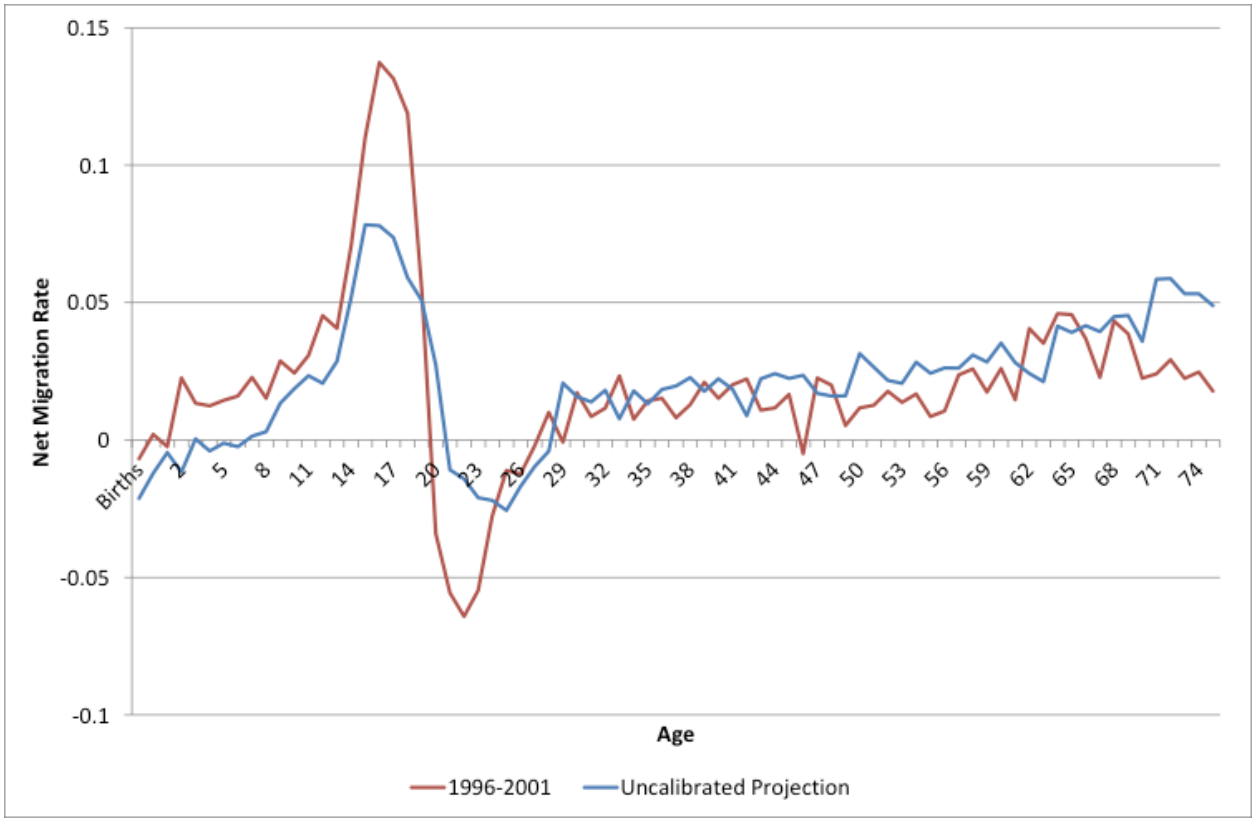
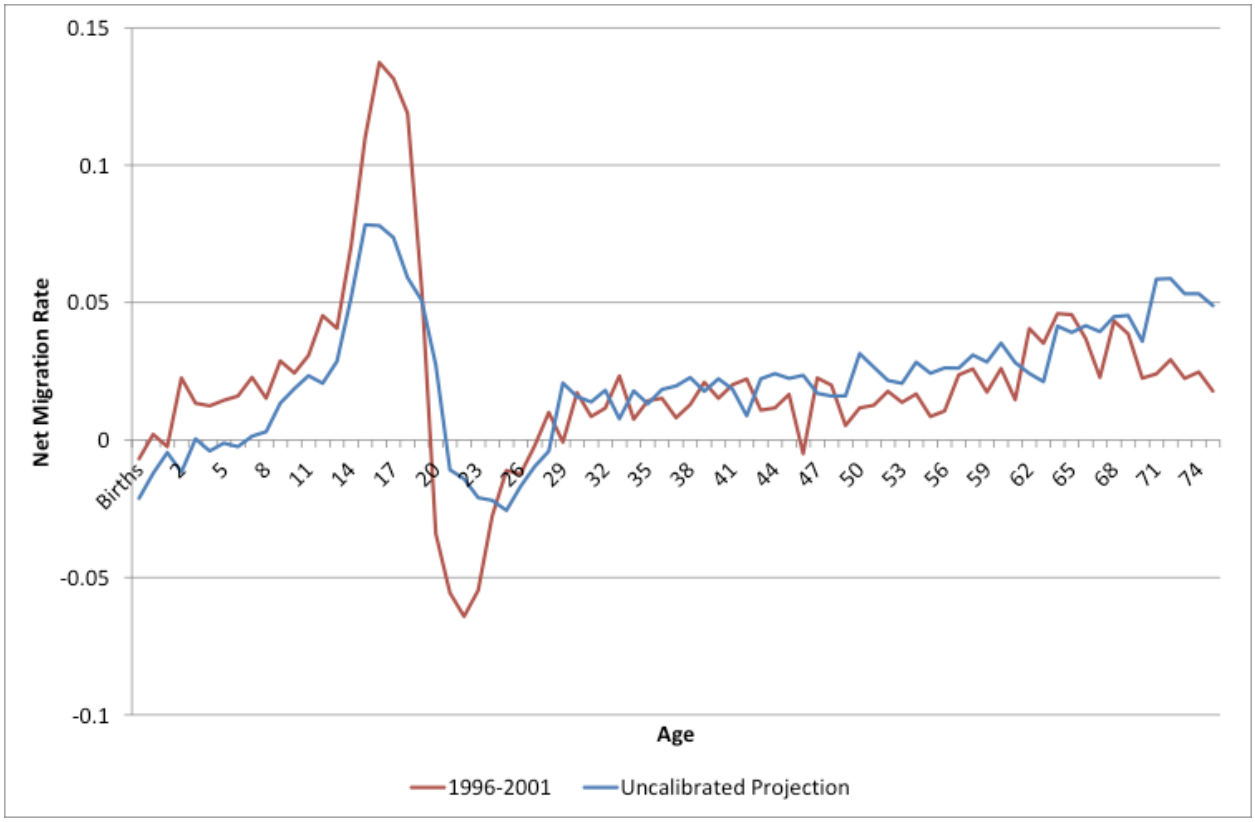
Appendices

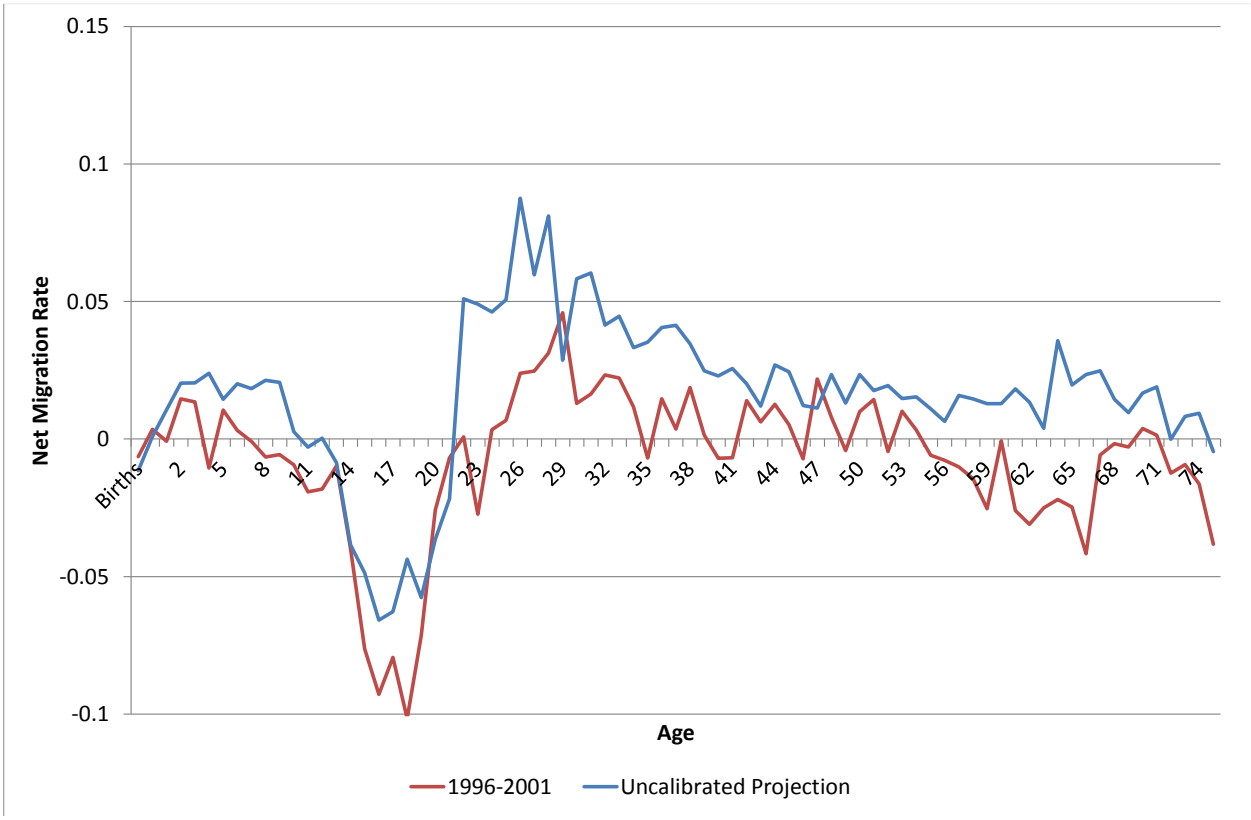
Appendix A.1: Net migration profile (single year of age) – Hamilton City female, 1996-2001



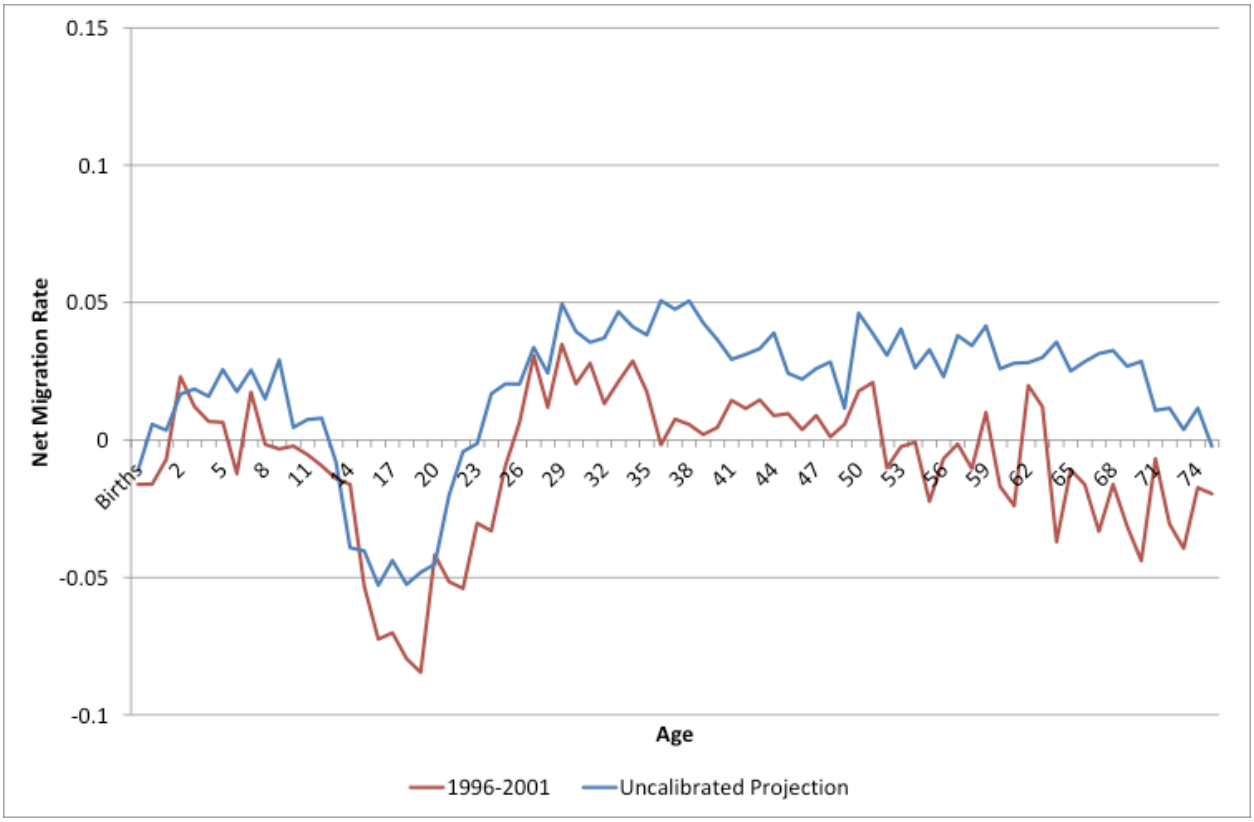
Appendix A.2: Net migration profile (single year of age) – Hamilton City male, 1996-2001



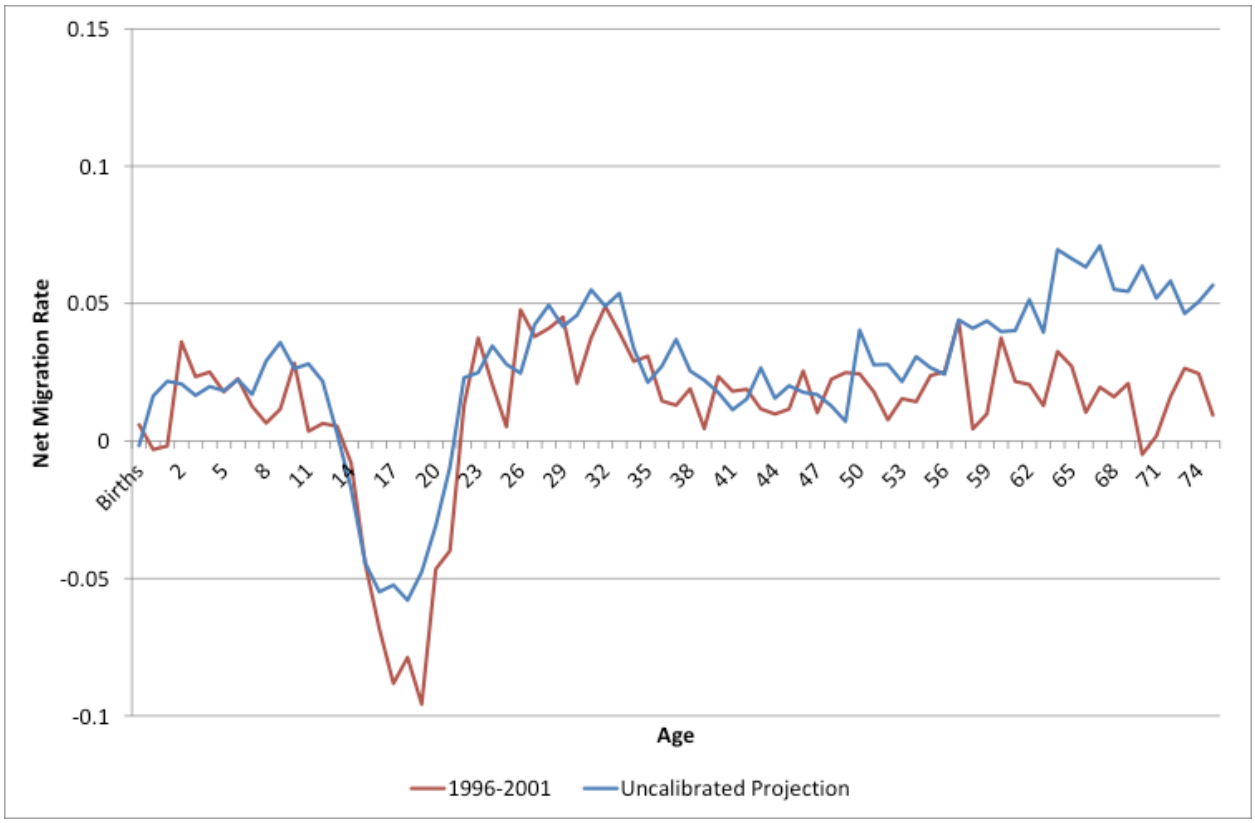
Appendix A.3: Net migration profile (single year of age) – Waikato District female, 1996-2001



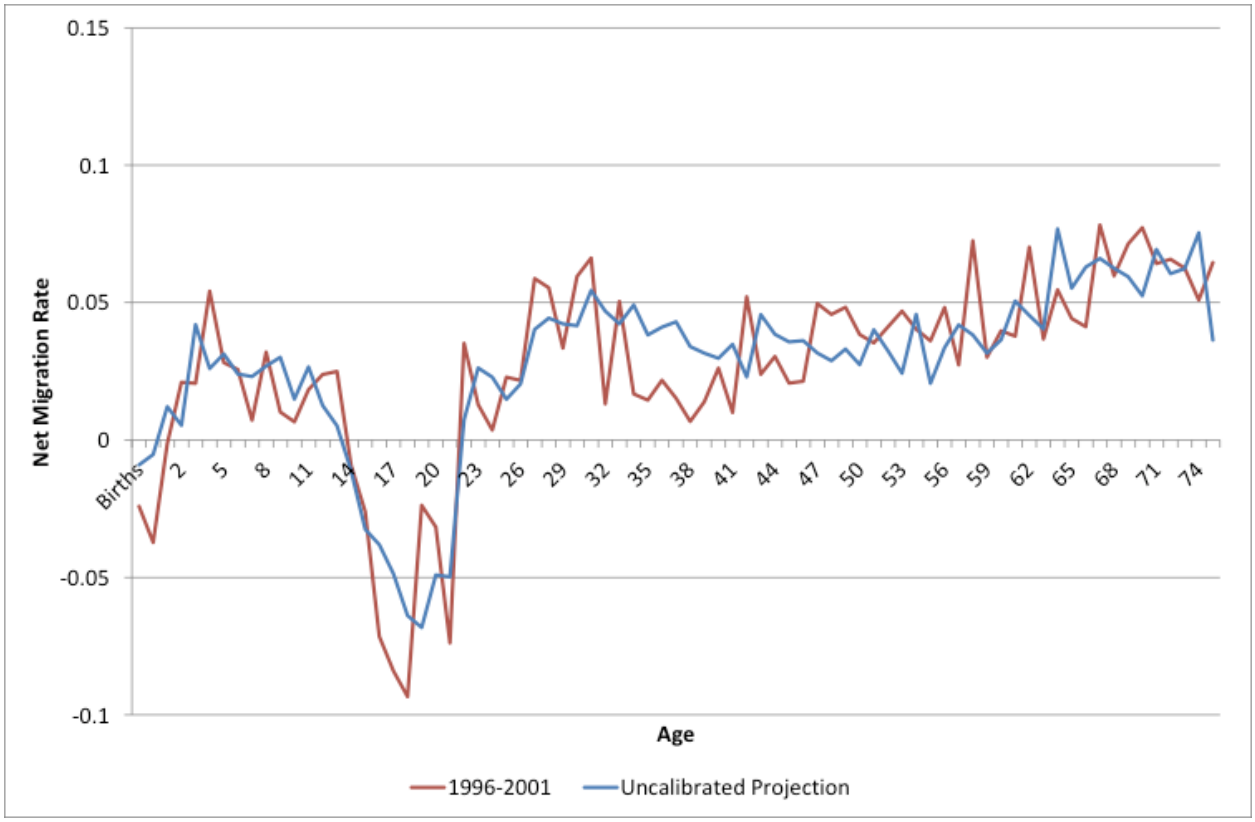
Appendix A.4: Net migration profile (single year of age) – Waikato District male, 1996-2001



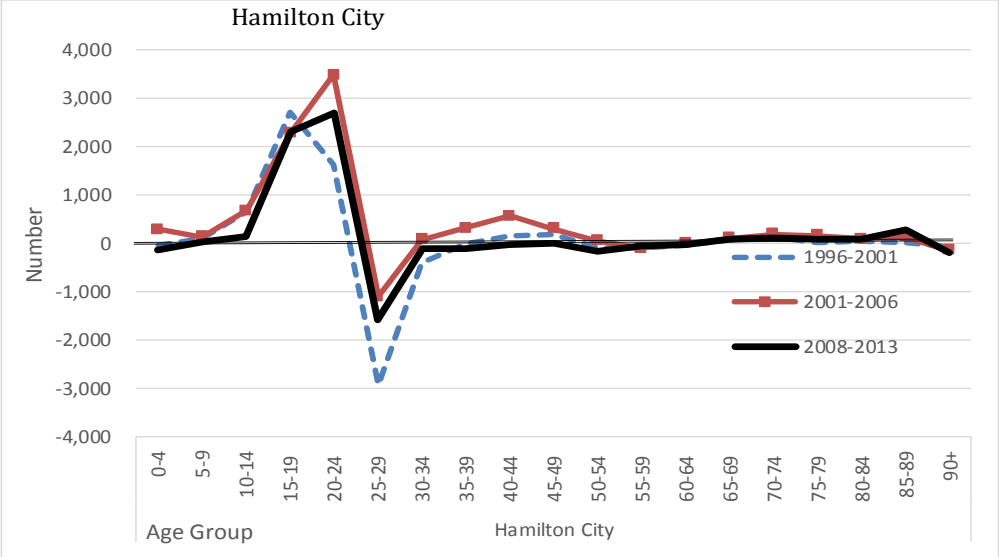
Appendix A.5: Net migration profile (single year of age) – Waipa District female, 1996-2001

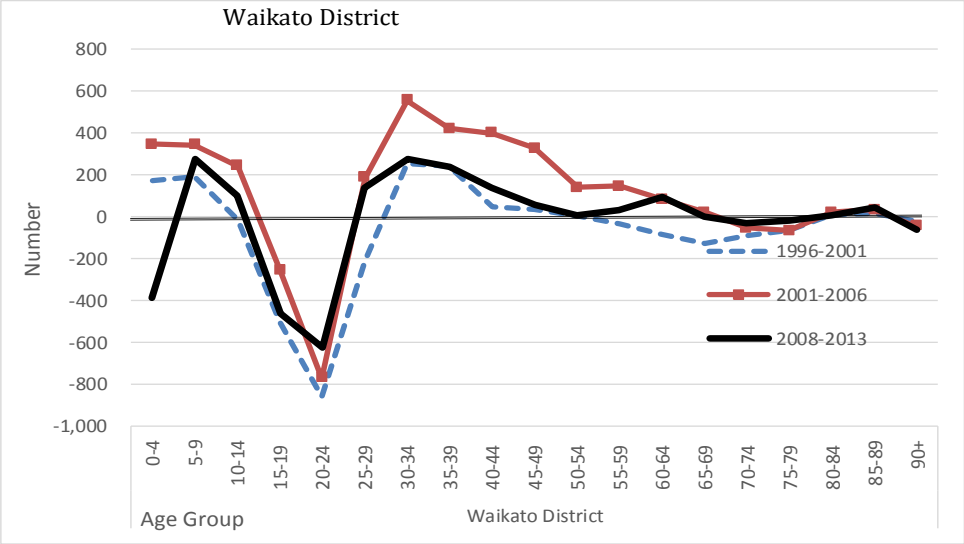


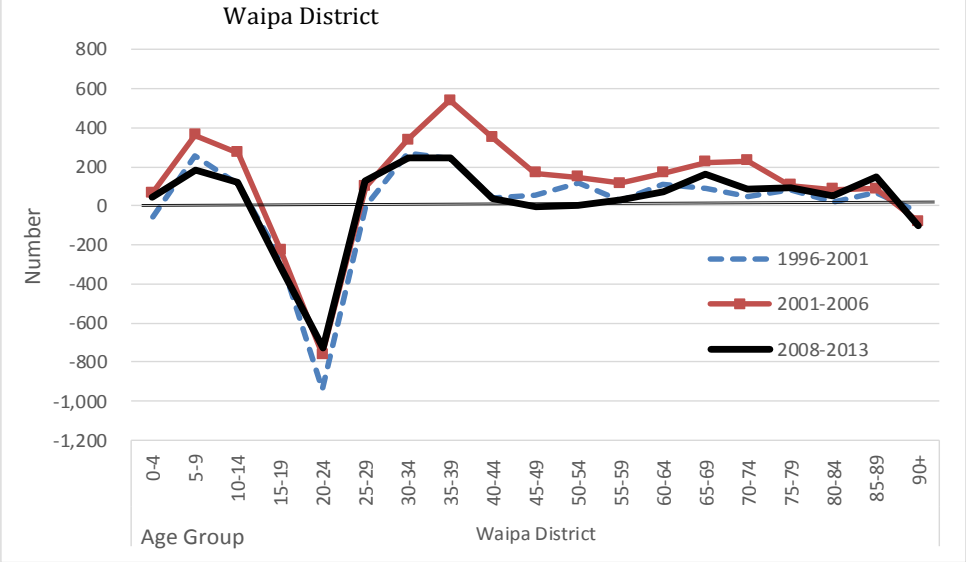
Appendix A.6: Net migration profile (single year of age) – Waipa District male, 1996-2001



Appendix A.7: Net migration age profile (5-year age groups), males and females combined – Hamilton City, Waikato District, Waipa District, 1996-2001, 2001-2006, 2008-2013







Source: Jackson & Pawar (2013)/Statistics New Zealand various sources

Appendix B.1: NIDEA 2014 final projections by TA and comparison with Statistics NZ (2012) projections

	2006	2013*	2016	2021	2026	2031	2036	2041	2046	2051	2056	2061
Waikato District												
NIDEA		64,910	67,369	71,950	76,693	81,123	84,867	87,595	89,587	91,235	92,837	94,370
SNZ (high)	59,500	64,830	69,870	75,110	80,530	85,840						
SNZ (med)	59,500	64,300	67,940	71,660	75,320	78,710						
SNZ (low)	59,500	63,700	65,960	68,080	70,080	71,590						
Hamilton City												
NIDEA		147,290	153,331	164,281	175,863	186,745	196,250	204,346	210,751	215,494	218,792	220,969
SNZ (high)	134,750	147,130	160,470	174,020	187,850	201,890						
SNZ (med)	134,750	145,690	155,610	165,480	175,280	184,800						
SNZ (low)	134,750	144,290	150,770	156,890	162,650	167,980						
Waipa District												
NIDEA		46,400	47,472	49,892	52,506	54,664	56,170	56,470	55,707	54,412	53,150	52,157
SNZ (high)	43,710	46,470	49,120	51,760	54,340	56,690						
SNZ (med)	43,710	46,080	47,780	49,340	50,770	51,910						
SNZ (low)	43,710	45,620	46,400	46,920	47,220	47,200						

Statistics New Zealand, Subnational Population Projections by Age and Sex, 2006(base)-2031 (October 2012 update)

*Notes: * The 2013 value for the SNZ projections is for 2011 (no equivalent data are available for 2013)*

Appendix C.1: Baseline projections, low, medium and high series, Waikato District, 2013-2063

Waikato District	Low Series	Medium Series	High Series
2013	64,900	64,900	64,900
2014	65,302	65,698	66,095
2015	65,722	66,518	67,322
2016	66,165	67,369	68,596
2017	66,609	68,229	69,895
2018	67,074	69,126	71,251
2019	67,557	70,054	72,662
2020	68,037	70,997	74,111
2021	68,508	71,950	75,597
2022	68,964	72,904	77,108
2023	69,404	73,861	78,654
2024	69,821	74,814	80,221
2025	70,218	75,761	81,810
2026	70,584	76,693	83,408
2027	70,924	77,610	85,014
2028	71,239	78,513	86,627
2029	71,533	79,403	88,247
2030	71,805	80,278	89,868
2031	72,048	81,123	91,470
2032	72,265	81,945	93,064
2033	72,446	82,733	94,634
2034	72,591	83,486	96,182
2035	72,693	84,196	97,698
2036	72,755	84,867	99,187
2037	72,773	85,493	100,638
2038	72,752	86,078	102,057
2039	72,690	86,620	103,438
2040	72,591	87,122	104,788
2041	72,464	87,595	106,117
2042	72,307	88,039	107,429
2043	72,124	88,456	108,723
2044	71,922	88,852	110,007
2045	71,704	89,230	111,282
2046	71,464	89,587	112,548
2047	71,210	89,932	113,817
2048	70,943	90,266	115,093
2049	70,668	90,598	116,389
2050	70,379	90,921	117,696
2051	70,079	91,235	119,015
2052	69,774	91,551	120,358
2053	69,467	91,867	121,721
2054	69,160	92,187	123,110
2055	68,850	92,507	124,522
2056	68,546	92,837	125,969
2057	68,237	93,162	127,425
2058	67,922	93,483	128,897
2059	67,601	93,795	130,376
2060	67,264	94,090	131,852
2061	66,917	94,370	133,327
2062	66,554	94,630	134,792
2063	66,168	94,862	136,237

Appendix C.2: Baseline projections, low, medium and high series, Hamilton City, 2013-2063

Hamilton City	Low Series	Medium Series	High Series
2013	147,290	147,290	147,290
2014	148,372	149,260	150,149
2015	149,512	151,281	153,070
2016	150,679	153,331	156,033
2017	151,870	155,411	159,045
2018	153,122	157,563	162,153
2019	154,417	159,770	165,339
2020	155,737	162,012	168,582
2021	157,070	164,281	171,878
2022	158,424	166,583	175,229
2023	159,776	168,900	178,625
2024	161,128	171,236	182,072
2025	162,455	173,569	185,553
2026	163,720	175,863	189,030
2027	164,925	178,116	192,502
2028	166,080	180,340	195,980
2029	167,178	182,525	199,454
2030	168,201	184,651	202,900
2031	169,177	186,745	206,346
2032	170,073	188,775	209,762
2033	170,895	190,744	213,144
2034	171,628	192,635	216,481
2035	172,296	194,471	219,787
2036	172,899	196,250	223,060
2037	173,458	197,988	226,312
2038	173,961	199,672	229,525
2039	174,402	201,293	232,691
2040	174,787	202,856	235,813
2041	175,102	204,346	238,874
2042	175,321	205,739	241,852
2043	175,469	207,058	244,772
2044	175,574	208,336	247,666
2045	175,629	209,563	250,527
2046	175,644	210,751	253,363
2047	175,574	211,850	256,122
2048	175,422	212,864	258,806
2049	175,210	213,812	261,438
2050	174,924	214,683	264,006
2051	174,581	215,494	266,528
2052	174,178	216,243	269,002
2053	173,721	216,937	271,440
2054	173,224	217,585	273,841
2055	172,711	218,216	276,242
2056	172,147	218,792	278,601
2057	171,541	219,326	280,939
2058	170,897	219,823	283,261
2059	170,190	220,258	285,546
2060	169,436	220,647	287,806
2061	168,619	220,969	290,018
2062	167,735	221,219	292,172
2063	166,778	221,390	294,270

Appendix C.3: Baseline projections, low, medium and high series, Waipa District, 2013-2063

Waipa District	Low Series	Medium Series	High Series
2013	46,400	46,400	46,400
2014	46,403	46,720	47,037
2015	46,452	47,078	47,712
2016	46,541	47,472	48,425
2017	46,664	47,901	49,177
2018	46,825	48,369	49,977
2019	47,004	48,860	50,809
2020	47,198	49,375	51,677
2021	47,386	49,892	52,562
2022	47,585	50,428	53,478
2023	47,777	50,966	54,411
2024	47,951	51,494	55,350
2025	48,110	52,016	56,294
2026	48,233	52,506	57,221
2027	48,321	52,968	58,130
2028	48,392	53,414	59,032
2029	48,450	53,846	59,927
2030	48,496	54,267	60,817
2031	48,521	54,664	61,685
2032	48,528	55,038	62,531
2033	48,513	55,384	63,346
2034	48,459	55,685	64,115
2035	48,378	55,951	64,843
2036	48,259	56,170	65,519
2037	48,099	56,341	66,142
2038	47,891	56,452	66,694
2039	47,640	56,508	67,183
2040	47,352	56,516	67,613
2041	47,023	56,470	67,978
2042	46,659	56,377	68,283
2043	46,272	56,247	68,539
2044	45,869	56,092	68,761
2045	45,452	55,914	68,949
2046	45,018	55,707	69,097
2047	44,570	55,480	69,220
2048	44,114	55,239	69,324
2049	43,646	54,979	69,402
2050	43,165	54,701	69,462
2051	42,675	54,412	69,512
2052	42,194	54,131	69,570
2053	41,721	53,856	69,635
2054	41,265	53,602	69,731
2055	40,825	53,366	69,851
2056	40,402	53,150	69,997
2057	39,990	52,947	70,164
2058	39,574	52,742	70,338
2059	39,164	52,544	70,527
2060	38,753	52,345	70,721
2061	38,352	52,157	70,934
2062	37,954	51,971	71,152
2063	37,535	51,758	71,346

Appendix D.1: Numbers by age and sex, 2013, 2033, 2063, Waikato District

Waikato District	2013		2033		2063	
	Males	Females	Males	Females	Males	Females
0-4	2,560	2,290	2,533	2,408	2,484	2,361
5-9	2,770	2,580	2,703	2,582	2,580	2,465
10-14	2,660	2,460	2,707	2,537	2,610	2,445
15-19	2,410	2,090	2,097	1,910	2,150	1,958
20-24	2,070	1,890	1,748	1,527	1,668	1,544
25-29	1,750	1,680	1,806	1,974	1,668	1,872
30-34	1,670	1,710	1,908	2,339	1,940	2,406
35-39	1,870	1,980	2,404	2,827	2,335	2,877
40-44	2,220	2,490	3,119	3,603	2,631	3,066
45-49	2,370	2,450	2,929	2,797	2,677	2,971
50-54	2,500	2,450	2,666	2,346	3,143	3,140
55-59	2,210	2,160	2,764	2,381	3,555	3,468
60-64	1,890	1,830	3,035	2,752	3,558	3,302
65-69	1,550	1,450	3,055	2,659	3,990	3,542
70-74	1,020	970	2,871	2,562	4,314	4,128
75-79	670	660	1,894	2,046	3,016	2,855
80-84	400	460	889	1,055	1,529	1,443
85+	300	420	623	674	1,611	1,560
Total	32,890	32,020	41,752	40,981	47,459	47,403

Appendix D.2: Numbers by age and sex, 2013, 2033, 2063, Hamilton City

Hamilton City	2013		2033		2063	
	Males	Females	Males	Females	Males	Females
0-4	5,948	5,596	5,272	5,060	5,014	4,812
5-9	5,015	5,015	4,976	4,835	4,652	4,520
10-14	4,866	4,746	5,077	4,934	4,722	4,589
15-19	5,943	5,910	5,766	5,933	5,469	5,627
20-24	7,036	7,479	6,899	7,038	6,140	6,395
25-29	5,737	6,101	5,455	5,908	5,200	5,475
30-34	4,857	5,292	4,866	5,413	4,804	5,322
35-39	4,599	4,919	5,304	5,646	5,068	5,587
40-44	4,555	5,105	6,056	6,515	5,595	5,894
45-49	4,195	4,764	6,340	6,378	6,110	6,083
50-54	4,075	4,659	6,246	5,942	7,007	6,622
55-59	3,541	4,047	6,136	5,741	6,828	6,773
60-64	3,070	3,551	6,079	6,150	7,193	6,860
65-69	2,531	2,858	5,529	6,002	8,350	7,666
70-74	1,762	2,127	5,346	6,335	9,474	9,641
75-79	1,235	1,607	4,278	5,680	8,855	9,979
80-84	1,021	1,422	1,943	2,871	4,664	5,551
85+	725	1,381	1,086	1,705	3,804	5,047
Total	70,710	76,579	92,658	98,086	108,947	112,443

Appendix D.3: Numbers by age and sex, 2013, 2033, 2063, Waipa District

Waipa District	2013		2033		2063	
	Males	Females	Males	Females	Males	Females
0-4	1,540	1,500	1,240	1,220	945	929
5-9	1,760	1,580	1,345	1,296	1,018	981
10-14	1,710	1,620	1,436	1,404	1,090	1,065
15-19	1,650	1,500	1,241	1,192	978	937
20-24	1,350	1,200	995	1,008	737	752
25-29	1,170	1,200	1,078	1,087	750	812
30-34	1,120	1,210	1,145	1,224	881	971
35-39	1,240	1,360	1,452	1,485	1,048	1,131
40-44	1,540	1,660	1,789	1,623	1,169	1,212
45-49	1,540	1,810	1,721	1,577	1,274	1,235
50-54	1,740	1,790	1,550	1,415	1,520	1,401
55-59	1,450	1,620	1,605	1,521	1,781	1,544
60-64	1,360	1,330	1,996	2,003	1,814	1,693
65-69	1,170	1,230	2,152	2,585	2,371	2,217
70-74	860	980	2,662	2,955	3,170	2,794
75-79	720	780	2,222	2,697	3,017	2,866
80-84	450	630	1,096	1,170	1,445	1,485
85+	370	660	532	666	1,230	1,495
Total	22,740	23,660	27,256	28,128	26,238	25,520

Appendix E.1: Projected numbers for population and households, 2013- 2063, Waikato District, Hamilton City, Waipa District, Future Proof sub-region

Waikato District	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
Projected Population	64,910	69,126	73,861	78,513	82,733	86,078	88,456	90,266	91,867	93,483	94,862
Projected Households	23,615	26,408	29,324	32,153	34,630	36,541	37,996	39,136	40,096	41,055	41,963
Hamilton City	**2013**	**2018**	**2023**	**2028**	**2033**	**2038**	**2043**	**2048**	**2053**	**2058**	**2063**
Projected Population	147,290	157,563	168,900	180,340	190,744	199,672	207,058	212,864	216,937	219,823	221,390
Projected Households	54,797	61,134	68,087	75,322	82,257	88,156	92,975	96,811	99,613	101,721	103,132
Waipa District	**2013**	**2018**	**2023**	**2028**	**2033**	**2038**	**2043**	**2048**	**2053**	**2058**	**2063**
Projected Population	46,400	48,369	50,966	53,414	55,384	56,452	56,247	55,239	53,856	52,742	51,758
Projected Households	17,995	19,626	21,611	23,573	25,204	26,193	26,398	26,069	25,496	25,093	24,810
Future Proof Region	**2013**	**2018**	**2023**	**2028**	**2033**	**2038**	**2043**	**2048**	**2053**	**2058**	**2063**
Projected Population	258,600	275,057	293,726	312,266	328,861	342,202	351,761	358,369	362,660	366,047	368,010
Projected Households	96,407	107,168	119,022	131,048	142,091	150,890	157,369	162,016	165,205	167,869	169,905

Appendix F.1: Labour force projections, Scenario One, Waikato District

Scenario One: Waikato District	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	913	870	923	845	834	899	921	894	871	860	855
20-24	1,345	1,158	1,112	1,175	1,086	1,064	1,147	1,177	1,143	1,112	1,098
25-29	1,161	1,569	1,342	1,293	1,364	1,269	1,235	1,332	1,369	1,330	1,294
30-34	1,184	1,457	1,967	1,684	1,620	1,711	1,587	1,549	1,670	1,715	1,667
35-39	1,454	1,458	1,795	2,419	2,076	1,995	2,108	1,953	1,908	2,057	2,112
40-44	2,000	1,737	1,744	2,149	2,894	2,487	2,387	2,523	2,332	2,283	2,462
45-49	2,083	2,208	1,919	1,928	2,378	3,200	2,751	2,639	2,791	2,578	2,526
50-54	2,024	2,089	2,216	1,928	1,938	2,391	3,219	2,766	2,655	2,807	2,594
55-59	1,729	1,993	2,060	2,189	1,906	1,917	2,366	3,181	2,737	2,625	2,776
60-64	1,196	1,412	1,632	1,689	1,799	1,567	1,576	1,944	2,616	2,250	2,158
65-69	585	752	891	1,033	1,073	1,143	996	1,002	1,236	1,663	1,430
70-74	230	339	438	522	608	631	673	586	590	727	979
75-79	94	126	188	243	292	340	353	377	328	330	408
80-84	29	25	34	51	66	80	92	95	102	89	90
85+	17	16	15	19	28	38	48	57	62	67	64
						Male					
15-19	1,116	1,027	1,102	1,047	971	1,047	1,073	1,041	1,014	1,001	996
20-24	1,635	1,463	1,349	1,448	1,381	1,277	1,377	1,411	1,371	1,334	1,317
25-29	1,432	1,670	1,491	1,381	1,479	1,418	1,305	1,407	1,444	1,403	1,365
30-34	1,388	1,642	1,917	1,710	1,586	1,698	1,631	1,499	1,616	1,660	1,613
35-39	1,636	1,706	2,019	2,358	2,103	1,952	2,089	2,009	1,845	1,989	2,043
40-44	1,999	1,943	2,030	2,405	2,810	2,509	2,326	2,490	2,390	2,198	2,370
45-49	2,106	2,158	2,098	2,195	2,603	3,041	2,716	2,516	2,695	2,584	2,379
50-54	2,198	2,241	2,300	2,240	2,344	2,779	3,248	2,900	2,689	2,878	2,763
55-59	1,920	2,346	2,395	2,462	2,401	2,516	2,983	3,485	3,113	2,885	3,089
60-64	1,529	1,899	2,327	2,383	2,455	2,395	2,511	2,978	3,478	3,108	2,878
65-69	883	1,101	1,376	1,694	1,741	1,795	1,751	1,837	2,179	2,544	2,274
70-74	438	629	789	997	1,233	1,268	1,305	1,271	1,337	1,587	1,853
75-79	176	209	306	387	497	615	631	649	630	665	791
80-84	79	75	91	136	175	226	279	285	292	284	301
85+	36	43	45	53	75	102	133	168	186	195	195
Total	34,618	37,362	39,909	42,060	43,816	45,369	46,817	48,021	48,687	48,809	48,738

Appendix F.2: Labour force projections, Scenario Two, Waikato District

Scenario Two: Waikato District	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	913	877	937	864	860	926	949	921	897	886	881
20-24	1,345	1,174	1,142	1,223	1,147	1,123	1,210	1,242	1,206	1,174	1,159
25-29	1,161	1,605	1,404	1,382	1,490	1,386	1,349	1,455	1,495	1,453	1,413
30-34	1,184	1,493	2,065	1,811	1,782	1,883	1,746	1,704	1,837	1,887	1,833
35-39	1,454	1,493	1,881	2,593	2,275	2,186	2,310	2,140	2,091	2,254	2,315
40-44	2,000	1,764	1,797	2,247	3,070	2,638	2,532	2,677	2,474	2,422	2,611
45-49	2,083	2,220	1,941	1,961	2,432	3,272	2,814	2,699	2,855	2,637	2,583
50-54	2,024	2,106	2,252	1,975	2,001	2,468	3,322	2,855	2,740	2,897	2,678
55-59	1,729	2,015	2,104	2,259	1,988	1,999	2,466	3,316	2,853	2,737	2,894
60-64	1,196	1,454	1,729	1,840	2,013	1,754	1,763	2,176	2,927	2,518	2,415
65-69	585	791	983	1,193	1,294	1,379	1,201	1,208	1,490	2,005	1,724
70-74	230	374	526	680	854	887	946	824	829	1,022	1,376
75-79	94	139	227	319	414	483	500	534	465	468	578
80-84	29	31	52	92	137	166	192	199	213	185	187
85+	17	20	23	32	55	75	95	113	124	132	126
						Male					
15-19	1,116	1,027	1,102	1,047	971	1,047	1,073	1,041	1,014	1,001	996
20-24	1,635	1,463	1,349	1,448	1,381	1,277	1,377	1,411	1,371	1,334	1,317
25-29	1,432	1,670	1,491	1,381	1,479	1,418	1,305	1,407	1,444	1,403	1,365
30-34	1,388	1,642	1,917	1,710	1,586	1,698	1,631	1,499	1,616	1,660	1,613
35-39	1,636	1,706	2,019	2,358	2,103	1,952	2,089	2,009	1,845	1,989	2,043
40-44	1,999	1,943	2,030	2,405	2,810	2,509	2,326	2,490	2,390	2,198	2,370
45-49	2,106	2,158	2,098	2,195	2,603	3,041	2,716	2,516	2,695	2,584	2,379
50-54	2,198	2,241	2,300	2,240	2,344	2,779	3,248	2,900	2,689	2,878	2,763
55-59	1,920	2,346	2,395	2,462	2,401	2,516	2,983	3,485	3,113	2,885	3,089
60-64	1,529	1,899	2,327	2,383	2,455	2,395	2,511	2,978	3,478	3,108	2,878
65-69	883	1,101	1,376	1,694	1,741	1,795	1,751	1,837	2,179	2,544	2,274
70-74	438	629	789	997	1,233	1,268	1,305	1,271	1,337	1,587	1,853
75-79	176	209	306	387	497	615	631	649	630	665	791
80-84	79	75	91	136	175	226	279	285	292	284	301
85+	36	43	45	53	75	102	133	168	186	195	195
Total	34,618	37,708	40,697	43,365	45,662	47,260	48,754	50,008	50,773	50,992	51,000

Appendix F.3 Labour force projections, Scenario Three, Waikato District

Scenario Three: Waikato District	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	913	870	923	845	834	899	921	894	871	860	855
20-24	1,345	1,158	1,112	1,175	1,086	1,064	1,147	1,177	1,143	1,112	1,098
25-29	1,161	1,569	1,342	1,293	1,364	1,269	1,235	1,332	1,369	1,330	1,294
30-34	1,184	1,457	1,967	1,684	1,620	1,711	1,587	1,549	1,670	1,715	1,667
35-39	1,454	1,458	1,795	2,419	2,076	1,995	2,108	1,953	1,908	2,057	2,112
40-44	2,000	1,737	1,744	2,149	2,894	2,487	2,387	2,523	2,332	2,283	2,462
45-49	2,083	2,208	1,919	1,928	2,378	3,200	2,751	2,639	2,791	2,578	2,526
50-54	2,024	2,104	2,248	1,970	1,995	2,460	3,312	2,847	2,732	2,888	2,669
55-59	1,729	2,009	2,093	2,241	1,967	1,978	2,441	3,282	2,824	2,709	2,865
60-64	1,196	1,492	1,815	1,974	2,204	1,920	1,931	2,382	3,205	2,757	2,644
65-69	585	868	1,167	1,513	1,737	1,851	1,613	1,622	2,000	2,692	2,315
70-74	230	399	591	797	1,034	1,075	1,145	998	1,004	1,238	1,666
75-79	94	147	250	363	485	565	585	625	544	548	677
80-84	29	33	55	101	151	183	212	220	235	204	206
85+	17	19	19	26	42	58	73	87	95	102	97
						Male					
15-19	1,116	1,027	1,102	1,047	971	1,047	1,073	1,041	1,014	1,001	996
20-24	1,635	1,463	1,349	1,448	1,381	1,277	1,377	1,411	1,371	1,334	1,317
25-29	1,432	1,670	1,491	1,381	1,479	1,418	1,305	1,407	1,444	1,403	1,365
30-34	1,388	1,642	1,917	1,710	1,586	1,698	1,631	1,499	1,616	1,660	1,613
35-39	1,636	1,706	2,019	2,358	2,103	1,952	2,089	2,009	1,845	1,989	2,043
40-44	1,999	1,943	2,030	2,405	2,810	2,509	2,326	2,490	2,390	2,198	2,370
45-49	2,106	2,165	2,112	2,218	2,638	3,081	2,753	2,550	2,731	2,619	2,411
50-54	2,198	2,247	2,312	2,258	2,369	2,809	3,283	2,931	2,718	2,909	2,793
55-59	1,920	2,353	2,410	2,484	2,430	2,546	3,019	3,527	3,150	2,919	3,126
60-64	1,529	1,935	2,413	2,515	2,636	2,572	2,697	3,199	3,736	3,338	3,091
65-69	883	1,217	1,664	2,226	2,471	2,548	2,486	2,607	3,093	3,611	3,228
70-74	438	681	918	1,241	1,636	1,682	1,732	1,687	1,774	2,106	2,458
75-79	176	242	403	573	813	1,007	1,033	1,062	1,032	1,090	1,295
80-84	79	81	106	170	233	301	371	380	390	378	401
85+	36	49	59	78	123	166	217	273	303	318	317
Total	34,618	37,948	41,346	44,588	47,547	49,328	50,840	52,202	53,328	53,947	53,977

Appendix F.4 Labour force projections, Scenario Four, Waikato District

Scenario Four: Waikato District	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	913	877	937	864	860	926	949	921	897	886	881
20-24	1,345	1,174	1,142	1,223	1,147	1,123	1,210	1,242	1,206	1,174	1,159
25-29	1,161	1,605	1,404	1,382	1,490	1,386	1,349	1,455	1,495	1,453	1,413
30-34	1,184	1,493	2,065	1,811	1,782	1,883	1,746	1,704	1,837	1,887	1,833
35-39	1,454	1,493	1,881	2,593	2,275	2,186	2,310	2,140	2,091	2,254	2,315
40-44	2,000	1,764	1,797	2,247	3,070	2,638	2,532	2,677	2,474	2,422	2,611
45-49	2,083	2,224	1,947	1,971	2,449	3,295	2,833	2,717	2,874	2,655	2,601
50-54	2,024	2,116	2,274	2,004	2,040	2,516	3,387	2,911	2,794	2,954	2,730
55-59	1,729	2,026	2,127	2,295	2,030	2,042	2,520	3,388	2,915	2,796	2,957
60-64	1,196	1,510	1,858	2,041	2,297	2,002	2,013	2,484	3,341	2,874	2,756
65-69	585	905	1,253	1,662	1,944	2,071	1,805	1,814	2,238	3,012	2,590
70-74	230	428	668	934	1,247	1,296	1,381	1,203	1,210	1,493	2,009
75-79	94	168	313	485	682	794	823	879	765	770	952
80-84	29	38	71	137	214	260	301	311	333	290	292
85+	17	25	32	49	87	120	152	181	198	212	202
						Male					
15-19	1,116	1,027	1,102	1,047	971	1,047	1,073	1,041	1,014	1,001	996
20-24	1,635	1,463	1,349	1,448	1,381	1,277	1,377	1,411	1,371	1,334	1,317
25-29	1,432	1,670	1,491	1,381	1,479	1,418	1,305	1,407	1,444	1,403	1,365
30-34	1,388	1,642	1,917	1,710	1,586	1,698	1,631	1,499	1,616	1,660	1,613
35-39	1,636	1,706	2,019	2,358	2,103	1,952	2,089	2,009	1,845	1,989	2,043
40-44	1,999	1,943	2,030	2,405	2,810	2,509	2,326	2,490	2,390	2,198	2,370
45-49	2,106	2,165	2,112	2,218	2,638	3,081	2,753	2,550	2,731	2,619	2,411
50-54	2,198	2,247	2,312	2,258	2,369	2,809	3,283	2,931	2,718	2,909	2,793
55-59	1,920	2,353	2,410	2,484	2,430	2,546	3,019	3,527	3,150	2,919	3,126
60-64	1,529	1,935	2,413	2,515	2,636	2,572	2,697	3,199	3,736	3,338	3,091
65-69	883	1,217	1,664	2,226	2,471	2,548	2,486	2,607	3,093	3,611	3,228
70-74	438	681	918	1,241	1,636	1,682	1,732	1,687	1,774	2,106	2,458
75-79	176	242	403	573	813	1,007	1,033	1,062	1,032	1,090	1,295
80-84	79	81	106	170	233	301	371	380	390	378	401
85+	36	49	59	78	123	166	217	273	303	318	317
Total	34,618	38,267	42,076	45,809	49,293	51,150	52,702	54,100	55,274	56,004	56,126

Appendix F.5: Labour force projections, Scenario One, Hamilton City

Scenario One: Hamilton City	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	2,608	2,531	2,653	2,744	2,618	2,628	2,568	2,483	2,466	2,490	2,483
20-24	5,281	4,693	4,572	4,822	4,970	4,745	4,763	4,653	4,498	4,472	4,516
25-29	4,402	4,665	4,145	4,036	4,263	4,390	4,192	4,207	4,109	3,972	3,950
30-34	3,773	4,201	4,443	3,966	3,859	4,065	4,193	4,003	4,017	3,925	3,794
35-39	3,661	3,993	4,447	4,704	4,202	4,088	4,306	4,442	4,240	4,255	4,158
40-44	4,123	4,090	4,463	4,973	5,262	4,698	4,573	4,816	4,969	4,743	4,760
45-49	3,922	4,346	4,314	4,710	5,252	5,556	4,963	4,830	5,086	5,247	5,009
50-54	3,799	4,024	4,462	4,435	4,844	5,402	5,713	5,107	4,969	5,231	5,398
55-59	3,115	3,771	4,001	4,441	4,419	4,827	5,383	5,693	5,091	4,953	5,213
60-64	2,275	2,748	3,332	3,541	3,939	3,921	4,283	4,777	5,052	4,516	4,394
65-69	1,047	1,399	1,694	2,061	2,198	2,446	2,436	2,659	2,966	3,135	2,808
70-74	343	511	688	837	1,023	1,092	1,215	1,210	1,321	1,474	1,556
75-79	95	135	203	273	336	410	436	487	483	529	590
80-84	46	31	45	69	93	115	141	149	166	164	181
85+	76	71	58	65	94	133	172	213	240	267	277
						Male					
15-19	2,526	2,359	2,413	2,632	2,451	2,460	2,404	2,324	2,308	2,331	2,324
20-24	5,247	4,930	4,621	4,748	5,145	4,812	4,829	4,718	4,560	4,534	4,578
25-29	4,877	5,119	4,797	4,499	4,638	5,006	4,692	4,708	4,599	4,445	4,421
30-34	4,251	4,609	4,826	4,547	4,259	4,376	4,747	4,436	4,452	4,349	4,204
35-39	4,089	4,396	4,772	4,994	4,716	4,414	4,531	4,924	4,595	4,612	4,506
40-44	4,059	4,413	4,747	5,156	5,397	5,098	4,772	4,896	5,324	4,968	4,986
45-49	3,707	4,401	4,788	5,154	5,602	5,865	5,540	5,186	5,320	5,785	5,398
50-54	3,578	3,932	4,674	5,090	5,484	5,959	6,241	5,892	5,516	5,663	6,152
55-59	2,992	3,627	3,993	4,754	5,185	5,587	6,073	6,359	6,006	5,621	5,770
60-64	2,420	2,995	3,640	4,017	4,793	5,230	5,636	6,126	6,415	6,057	5,671
65-69	1,349	1,754	2,181	2,661	2,948	3,520	3,841	4,140	4,500	4,711	4,451
70-74	517	780	1,021	1,277	1,567	1,738	2,075	2,264	2,440	2,652	2,777
75-79	165	225	345	453	572	704	778	928	1,013	1,092	1,184
80-84	57	37	52	82	108	136	168	185	221	241	259
85+	37	40	34	38	56	79	104	130	150	175	197
Total	78,438	84,826	90,424	95,779	100,292	103,501	105,768	106,944	107,094	106,610	105,968

Appendix E.6: Labour force projections, Scenario Two, Hamilton City

Scenario Two: Hamilton City	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	2,608	2,531	2,653	2,744	2,618	2,628	2,568	2,483	2,466	2,490	2,483
20-24	5,281	4,759	4,700	5,025	5,248	5,011	5,029	4,913	4,749	4,722	4,769
25-29	4,402	4,873	4,515	4,576	5,023	5,173	4,939	4,957	4,842	4,681	4,655
30-34	3,773	4,440	4,949	4,643	4,738	4,991	5,148	4,914	4,932	4,819	4,658
35-39	3,661	4,187	4,880	5,390	5,020	4,884	5,144	5,307	5,065	5,084	4,967
40-44	4,123	4,196	4,694	5,359	5,806	5,184	5,046	5,314	5,482	5,233	5,252
45-49	3,922	4,425	4,472	4,968	5,636	5,962	5,326	5,183	5,458	5,631	5,375
50-54	3,799	4,101	4,634	4,691	5,217	5,819	6,153	5,501	5,352	5,634	5,814
55-59	3,115	3,863	4,196	4,766	4,851	5,299	5,909	6,250	5,589	5,437	5,723
60-64	2,275	2,907	3,717	4,155	4,848	4,826	5,272	5,880	6,218	5,558	5,409
65-69	1,047	1,558	2,080	2,766	3,200	3,560	3,545	3,870	4,318	4,563	4,087
70-74	343	616	968	1,349	1,857	1,983	2,206	2,198	2,398	2,676	2,826
75-79	95	178	330	531	759	927	986	1,099	1,092	1,196	1,334
80-84	46	37	61	106	159	196	240	255	283	280	308
85+	76	71	58	65	94	133	172	213	240	267	277
						Male					
15-19	2,526	2,359	2,413	2,632	2,451	2,460	2,404	2,324	2,308	2,331	2,324
20-24	5,247	4,930	4,621	4,748	5,145	4,812	4,829	4,718	4,560	4,534	4,578
25-29	4,877	5,119	4,797	4,499	4,638	5,006	4,692	4,708	4,599	4,445	4,421
30-34	4,251	4,609	4,826	4,547	4,259	4,376	4,747	4,436	4,452	4,349	4,204
35-39	4,089	4,396	4,772	4,994	4,716	4,414	4,531	4,924	4,595	4,612	4,506
40-44	4,059	4,413	4,747	5,156	5,397	5,098	4,772	4,896	5,324	4,968	4,986
45-49	3,707	4,401	4,788	5,154	5,602	5,865	5,540	5,186	5,320	5,785	5,398
50-54	3,578	3,932	4,674	5,090	5,484	5,959	6,241	5,892	5,516	5,663	6,152
55-59	2,992	3,627	3,993	4,754	5,185	5,587	6,073	6,359	6,006	5,621	5,770
60-64	2,420	2,995	3,640	4,017	4,793	5,230	5,636	6,126	6,415	6,057	5,671
65-69	1,349	1,754	2,181	2,661	2,948	3,520	3,841	4,140	4,500	4,711	4,451
70-74	517	780	1,021	1,277	1,567	1,738	2,075	2,264	2,440	2,652	2,777
75-79	165	225	345	453	572	704	778	928	1,013	1,092	1,184
80-84	57	37	52	82	108	136	168	185	221	241	259
85+	37	40	34	38	56	79	104	130	150	175	197
Total	78,438	86,358	93,811	101,235	107,994	111,559	114,115	115,551	115,905	115,507	114,816

Appendix F.7 Labour force projections, Scenario Three, Hamilton City

Scenario Three: Hamilton City	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	2,608	2,531	2,653	2,744	2,618	2,628	2,568	2,483	2,466	2,490	2,483
20-24	5,281	4,693	4,572	4,822	4,970	4,745	4,763	4,653	4,498	4,472	4,516
25-29	4,402	4,665	4,145	4,036	4,263	4,390	4,192	4,207	4,109	3,972	3,950
30-34	3,773	4,201	4,443	3,966	3,859	4,065	4,193	4,003	4,017	3,925	3,794
35-39	3,661	3,993	4,447	4,704	4,202	4,088	4,306	4,442	4,240	4,255	4,158
40-44	4,123	4,090	4,463	4,973	5,262	4,698	4,573	4,816	4,969	4,743	4,760
45-49	3,922	4,346	4,314	4,710	5,252	5,556	4,963	4,830	5,086	5,247	5,009
50-54	3,799	4,034	4,485	4,468	4,892	5,456	5,770	5,158	5,019	5,283	5,452
55-59	3,115	3,827	4,119	4,638	4,680	5,112	5,701	6,030	5,392	5,245	5,522
60-64	2,275	2,887	3,668	4,077	4,733	4,711	5,147	5,741	6,071	5,426	5,280
65-69	1,047	1,660	2,329	3,219	3,845	4,277	4,260	4,650	5,188	5,483	4,911
70-74	343	674	1,124	1,633	2,320	2,478	2,756	2,746	2,996	3,343	3,531
75-79	95	193	378	627	917	1,119	1,190	1,327	1,318	1,445	1,611
80-84	46	38	64	112	170	209	256	271	302	298	328
85+	76	71	58	65	94	133	172	213	240	267	277
						Male					
15-19	2,526	2,359	2,413	2,632	2,451	2,460	2,404	2,324	2,308	2,331	2,324
20-24	5,247	4,930	4,621	4,748	5,145	4,812	4,829	4,718	4,560	4,534	4,578
25-29	4,877	5,119	4,797	4,499	4,638	5,006	4,692	4,708	4,599	4,445	4,421
30-34	4,251	4,609	4,826	4,547	4,259	4,376	4,747	4,436	4,452	4,349	4,204
35-39	4,089	4,396	4,772	4,994	4,716	4,414	4,531	4,924	4,595	4,612	4,506
40-44	4,059	4,413	4,747	5,156	5,397	5,098	4,772	4,896	5,324	4,968	4,986
45-49	3,707	4,410	4,809	5,187	5,650	5,915	5,587	5,230	5,366	5,834	5,444
50-54	3,578	3,938	4,688	5,114	5,519	5,997	6,281	5,929	5,551	5,698	6,191
55-59	2,992	3,662	4,071	4,893	5,388	5,806	6,310	6,608	6,241	5,841	5,995
60-64	2,420	3,048	3,770	4,233	5,137	5,605	6,040	6,565	6,874	6,492	6,078
65-69	1,349	1,964	2,703	3,616	4,360	5,206	5,680	6,123	6,656	6,967	6,583
70-74	517	940	1,438	2,061	2,850	3,160	3,773	4,117	4,438	4,822	5,050
75-79	165	292	551	858	1,254	1,544	1,706	2,036	2,222	2,396	2,596
80-84	57	50	88	169	260	328	405	445	531	581	623
85+	37	41	35	40	60	85	111	139	161	188	211
Total	78,438	86,074	93,592	101,543	109,159	113,479	116,680	118,768	119,790	119,954	119,375

Appendix F.8: Labour force projections, Scenario Four, Hamilton City

Scenario Four: Hamilton City	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	2,608	2,531	2,653	2,744	2,618	2,628	2,568	2,483	2,466	2,490	2,483
20-24	5,281	4,726	4,636	4,923	5,109	4,878	4,896	4,783	4,623	4,597	4,643
25-29	4,402	4,769	4,330	4,306	4,643	4,782	4,565	4,582	4,476	4,327	4,302
30-34	3,773	4,321	4,696	4,304	4,298	4,528	4,670	4,458	4,475	4,372	4,226
35-39	3,661	4,090	4,664	5,047	4,611	4,486	4,725	4,875	4,653	4,670	4,563
40-44	4,123	4,143	4,578	5,166	5,534	4,941	4,809	5,065	5,226	4,988	5,006
45-49	3,922	4,390	4,403	4,855	5,468	5,784	5,167	5,028	5,295	5,463	5,215
50-54	3,799	4,071	4,567	4,591	5,071	5,656	5,981	5,347	5,203	5,476	5,652
55-59	3,115	3,865	4,200	4,774	4,861	5,309	5,921	6,262	5,600	5,447	5,734
60-64	2,275	2,927	3,766	4,233	4,965	4,941	5,398	6,021	6,368	5,692	5,538
65-69	1,047	1,731	2,500	3,532	4,289	4,771	4,752	5,187	5,787	6,116	5,478
70-74	343	740	1,301	1,957	2,849	3,042	3,383	3,371	3,679	4,104	4,335
75-79	95	231	491	856	1,291	1,576	1,676	1,869	1,856	2,034	2,268
80-84	46	47	90	172	277	341	417	442	492	486	535
85+	76	71	58	65	94	134	173	215	242	269	279
						Male					
15-19	2,526	2,359	2,413	2,632	2,451	2,460	2,404	2,324	2,308	2,331	2,324
20-24	5,247	4,930	4,621	4,748	5,145	4,812	4,829	4,718	4,560	4,534	4,578
25-29	4,877	5,119	4,797	4,499	4,638	5,006	4,692	4,708	4,599	4,445	4,421
30-34	4,251	4,609	4,826	4,547	4,259	4,376	4,747	4,436	4,452	4,349	4,204
35-39	4,089	4,396	4,772	4,994	4,716	4,414	4,531	4,924	4,595	4,612	4,506
40-44	4,059	4,413	4,747	5,156	5,397	5,098	4,772	4,896	5,324	4,968	4,986
45-49	3,707	4,410	4,809	5,187	5,650	5,915	5,587	5,230	5,366	5,834	5,444
50-54	3,578	3,938	4,688	5,114	5,519	5,997	6,281	5,929	5,551	5,698	6,191
55-59	2,992	3,662	4,071	4,893	5,388	5,806	6,310	6,608	6,241	5,841	5,995
60-64	2,420	3,048	3,770	4,233	5,137	5,605	6,040	6,565	6,874	6,492	6,078
65-69	1,349	1,964	2,703	3,616	4,360	5,206	5,680	6,123	6,656	6,967	6,583
70-74	517	940	1,438	2,061	2,850	3,160	3,773	4,117	4,438	4,822	5,050
75-79	165	292	551	858	1,254	1,544	1,706	2,036	2,222	2,396	2,596
80-84	57	50	88	169	260	328	405	445	531	581	623
85+	37	41	35	40	60	85	111	139	161	188	211
Total	78,438	86,825	95,264	104,273	113,058	117,609	120,973	123,186	124,317	124,589	124,049

Appendix F.9: Labour force projections, Scenario One, Waipa District

Scenario One: Waipa District	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	718	650	665	632	571	564	543	516	494	473	449
20-24	914	864	788	803	768	691	684	657	626	598	573
25-29	859	893	839	767	779	749	672	665	640	609	582
30-34	907	1,027	1,069	1,002	917	930	896	803	795	765	728
35-39	1,075	1,059	1,200	1,246	1,174	1,072	1,089	1,046	939	929	894
40-44	1,368	1,154	1,137	1,290	1,338	1,263	1,152	1,172	1,124	1,010	999
45-49	1,564	1,443	1,218	1,200	1,363	1,414	1,335	1,217	1,238	1,188	1,067
50-54	1,521	1,563	1,445	1,220	1,203	1,366	1,419	1,337	1,219	1,239	1,191
55-59	1,328	1,548	1,593	1,474	1,247	1,229	1,395	1,449	1,364	1,246	1,266
60-64	925	1,246	1,457	1,502	1,393	1,178	1,162	1,318	1,371	1,288	1,177
65-69	482	617	834	978	1,013	940	796	784	889	927	868
70-74	174	255	328	446	525	543	504	426	420	477	496
75-79	66	86	129	165	227	267	275	255	215	212	242
80-84	25	18	24	37	47	65	76	78	71	60	59
85+	25	20	16	17	26	35	48	60	65	64	57
						Male					
15-19	827	730	776	698	622	615	592	564	539	517	490
20-24	1,148	999	885	940	846	754	746	718	684	654	627
25-29	1,050	1,177	1,025	914	967	875	776	768	740	704	673
30-34	1,024	1,200	1,344	1,171	1,046	1,106	1,002	887	879	846	805
35-39	1,153	1,179	1,382	1,549	1,351	1,205	1,275	1,154	1,023	1,013	975
40-44	1,423	1,229	1,256	1,474	1,653	1,442	1,285	1,360	1,231	1,091	1,080
45-49	1,429	1,539	1,329	1,360	1,597	1,791	1,562	1,393	1,474	1,333	1,182
50-54	1,578	1,473	1,588	1,373	1,406	1,651	1,851	1,615	1,440	1,523	1,378
55-59	1,316	1,666	1,559	1,682	1,456	1,491	1,751	1,965	1,713	1,528	1,617
60-64	1,126	1,283	1,630	1,528	1,653	1,432	1,467	1,722	1,931	1,684	1,503
65-69	706	946	1,082	1,380	1,300	1,406	1,219	1,248	1,465	1,642	1,431
70-74	324	506	681	783	1,004	946	1,024	887	909	1,067	1,196
75-79	134	167	264	356	413	529	497	540	466	477	561
80-84	56	48	61	101	136	158	201	188	204	175	179
85+	33	29	26	30	47	68	84	105	110	116	108
Total	25,279	26,615	27,629	28,120	28,085	27,775	27,375	26,898	26,275	25,454	24,454

Appendix F.10: Labour force projections, Scenario Two, Waipa District

Scenario Two: Waipa District	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	718	658	681	654	597	590	568	540	517	495	469
20-24	914	889	834	872	857	771	762	733	698	667	639
25-29	859	949	945	912	976	938	842	833	801	762	729
30-34	907	1,084	1,186	1,168	1,119	1,135	1,093	980	969	933	888
35-39	1,075	1,105	1,306	1,412	1,381	1,261	1,281	1,231	1,105	1,093	1,052
40-44	1,368	1,189	1,206	1,407	1,500	1,416	1,291	1,314	1,261	1,132	1,120
45-49	1,564	1,470	1,263	1,267	1,464	1,519	1,434	1,307	1,330	1,276	1,146
50-54	1,521	1,589	1,493	1,281	1,283	1,457	1,513	1,426	1,301	1,322	1,270
55-59	1,328	1,590	1,679	1,593	1,381	1,361	1,545	1,605	1,510	1,379	1,401
60-64	925	1,306	1,596	1,718	1,659	1,404	1,384	1,570	1,633	1,535	1,402
65-69	482	701	1,060	1,376	1,561	1,449	1,227	1,209	1,371	1,429	1,338
70-74	174	327	512	821	1,115	1,154	1,071	906	893	1,013	1,054
75-79	66	112	206	315	502	589	608	563	475	468	533
80-84	25	27	48	94	145	201	235	241	221	187	184
85+	25	27	26	34	59	81	111	137	150	148	132
						Male					
15-19	827	730	776	698	622	615	592	564	539	517	490
20-24	1,148	999	885	940	846	754	746	718	684	654	627
25-29	1,050	1,177	1,025	914	967	875	776	768	740	704	673
30-34	1,024	1,200	1,344	1,171	1,046	1,106	1,002	887	879	846	805
35-39	1,153	1,179	1,382	1,549	1,351	1,205	1,275	1,154	1,023	1,013	975
40-44	1,423	1,229	1,256	1,474	1,653	1,442	1,285	1,360	1,231	1,091	1,080
45-49	1,429	1,539	1,329	1,360	1,597	1,791	1,562	1,393	1,474	1,333	1,182
50-54	1,578	1,473	1,588	1,373	1,406	1,651	1,851	1,615	1,440	1,523	1,378
55-59	1,316	1,666	1,559	1,682	1,456	1,491	1,751	1,965	1,713	1,528	1,617
60-64	1,126	1,283	1,630	1,528	1,653	1,432	1,467	1,722	1,931	1,684	1,503
65-69	706	946	1,082	1,380	1,300	1,406	1,219	1,248	1,465	1,642	1,431
70-74	324	506	681	783	1,004	946	1,024	887	909	1,067	1,196
75-79	134	167	264	356	413	529	497	540	466	477	561
80-84	56	48	61	101	136	158	201	188	204	175	179
85+	33	29	26	30	47	68	84	105	110	116	108
Total	25,279	27,193	28,929	30,265	31,095	30,795	30,295	29,709	29,039	28,209	27,165

Appendix F.11: Labour force projections, Scenario Three, Waipa District

Scenario Three: Waipa District	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	718	650	665	632	571	564	543	516	494	473	449
20-24	914	864	788	803	768	691	684	657	626	598	573
25-29	859	893	839	767	779	749	672	665	640	609	582
30-34	907	1,027	1,069	1,002	917	930	896	803	795	765	728
35-39	1,075	1,059	1,200	1,246	1,174	1,072	1,089	1,046	939	929	894
40-44	1,368	1,154	1,137	1,290	1,338	1,263	1,152	1,172	1,124	1,010	999
45-49	1,564	1,443	1,218	1,200	1,363	1,414	1,335	1,217	1,238	1,188	1,067
50-54	1,521	1,570	1,457	1,235	1,223	1,388	1,442	1,359	1,240	1,260	1,211
55-59	1,328	1,562	1,623	1,515	1,293	1,275	1,446	1,503	1,414	1,292	1,312
60-64	925	1,302	1,587	1,704	1,642	1,389	1,370	1,554	1,616	1,519	1,388
65-69	482	737	1,157	1,547	1,797	1,669	1,413	1,392	1,579	1,645	1,541
70-74	174	332	525	848	1,157	1,198	1,112	940	927	1,052	1,094
75-79	66	110	200	303	479	562	580	537	453	447	509
80-84	25	23	37	67	99	137	159	164	150	127	125
85+	25	21	16	18	27	37	50	62	68	67	60
						Male					
15-19	827	730	776	698	622	615	592	564	539	517	490
20-24	1,148	999	885	940	846	754	746	718	684	654	627
25-29	1,050	1,177	1,025	914	967	875	776	768	740	704	673
30-34	1,024	1,200	1,344	1,171	1,046	1,106	1,002	887	879	846	805
35-39	1,153	1,179	1,382	1,549	1,351	1,205	1,275	1,154	1,023	1,013	975
40-44	1,423	1,231	1,260	1,481	1,664	1,451	1,294	1,369	1,239	1,098	1,088
45-49	1,429	1,539	1,329	1,360	1,597	1,791	1,562	1,393	1,474	1,333	1,182
50-54	1,578	1,482	1,607	1,397	1,439	1,690	1,895	1,653	1,474	1,560	1,411
55-59	1,316	1,666	1,559	1,682	1,456	1,491	1,751	1,965	1,713	1,528	1,617
60-64	1,126	1,314	1,708	1,638	1,811	1,569	1,607	1,887	2,116	1,845	1,647
65-69	706	1,034	1,283	1,765	1,782	1,928	1,671	1,712	2,009	2,253	1,963
70-74	324	582	885	1,136	1,607	1,514	1,639	1,420	1,455	1,708	1,914
75-79	134	210	400	631	838	1,072	1,008	1,095	945	967	1,138
80-84	56	54	77	139	204	237	301	282	305	262	269
85+	33	32	31	39	66	95	118	148	155	163	153
Total	25,279	27,174	29,068	30,718	31,922	31,732	31,179	30,602	30,048	29,429	28,481

Appendix F.12: Labour force projections, Scenario Four, Waipa District

Scenario Four: Waipa District	2013	2018	2023	2028	2033	2038	2043	2048	2053	2058	2063
						Female					
15-19	718	654	673	643	584	577	555	528	505	484	459
20-24	914	877	811	837	813	731	723	695	662	633	606
25-29	859	921	892	840	877	844	757	749	721	685	655
30-34	907	1,055	1,127	1,085	1,018	1,032	995	891	882	849	808
35-39	1,075	1,082	1,253	1,329	1,277	1,166	1,185	1,139	1,022	1,011	973
40-44	1,368	1,172	1,173	1,352	1,424	1,344	1,226	1,247	1,196	1,075	1,063
45-49	1,564	1,457	1,240	1,234	1,413	1,466	1,385	1,262	1,284	1,232	1,106
50-54	1,521	1,584	1,484	1,270	1,268	1,440	1,496	1,410	1,286	1,307	1,256
55-59	1,328	1,576	1,651	1,554	1,337	1,318	1,495	1,554	1,462	1,336	1,357
60-64	925	1,322	1,633	1,775	1,730	1,464	1,443	1,637	1,703	1,600	1,462
65-69	482	763	1,228	1,672	1,969	1,828	1,548	1,525	1,730	1,802	1,688
70-74	174	370	623	1,048	1,471	1,522	1,413	1,195	1,178	1,337	1,391
75-79	66	136	276	449	748	879	906	839	708	698	795
80-84	25	28	52	102	158	219	255	262	241	203	201
85+	25	26	25	32	55	75	103	127	140	137	123
						Male					
15-19	827	730	776	698	622	615	592	564	539	517	490
20-24	1,148	999	885	940	846	754	746	718	684	654	627
25-29	1,050	1,177	1,025	914	967	875	776	768	740	704	673
30-34	1,024	1,200	1,344	1,171	1,046	1,106	1,002	887	879	846	805
35-39	1,153	1,179	1,382	1,549	1,351	1,205	1,275	1,154	1,023	1,013	975
40-44	1,423	1,231	1,260	1,481	1,664	1,451	1,294	1,369	1,239	1,098	1,088
45-49	1,429	1,539	1,329	1,360	1,597	1,791	1,562	1,393	1,474	1,333	1,182
50-54	1,578	1,482	1,607	1,397	1,439	1,690	1,895	1,653	1,474	1,560	1,411
55-59	1,316	1,666	1,559	1,682	1,456	1,491	1,751	1,965	1,713	1,528	1,617
60-64	1,126	1,314	1,708	1,638	1,811	1,569	1,607	1,887	2,116	1,845	1,647
65-69	706	1,034	1,283	1,765	1,782	1,928	1,671	1,712	2,009	2,253	1,963
70-74	324	582	885	1,136	1,607	1,514	1,639	1,420	1,455	1,708	1,914
75-79	134	210	400	631	838	1,072	1,008	1,095	945	967	1,138
80-84	56	54	77	139	204	237	301	282	305	262	269
85+	33	32	31	39	66	95	118	148	155	163	153
Total	25,279	27,451	29,693	31,762	33,439	33,301	32,721	32,076	31,465	30,839	29,893

Appendix G.1: Motor vehicle projections, Waikato District 2013-2063

Waikato District	Low Series	Medium Series	High Series
2013	38,946	39,556	40,218
2014	39,317	40,378	41,463
2015	39,705	41,228	42,753
2016	40,110	42,106	44,092
2017	40,449	42,971	45,482
2018	40,802	43,867	46,930
2019	41,167	44,793	48,436
2020	41,531	45,736	49,991
2021	41,891	46,696	51,593
2022	42,255	47,693	53,284
2023	42,611	48,704	55,024
2024	42,954	49,721	56,806
2025	43,285	50,745	58,631
2026	43,598	51,768	60,489
2027	43,881	52,806	62,432
2028	44,150	53,844	64,410
2029	44,406	54,884	66,422
2030	44,649	55,921	68,464
2031	44,874	56,948	70,523
2032	45,012	57,526	71,748
2033	45,127	58,078	72,955
2034	45,220	58,607	74,146
2035	45,285	59,105	75,311
2036	45,326	59,577	76,456
2037	45,339	60,016	77,571
2038	45,328	60,427	78,661
2039	45,292	60,807	79,723
2040	45,232	61,160	80,760
2041	45,155	61,492	81,782
2042	45,059	61,803	82,789
2043	44,947	62,096	83,784
2044	44,823	62,374	84,771
2045	44,689	62,640	85,751
2046	44,541	62,890	86,723
2047	44,385	63,132	87,698
2048	44,220	63,367	88,680
2049	44,050	63,600	89,676
2050	43,871	63,826	90,680
2051	43,685	64,047	91,694
2052	43,496	64,269	92,727
2053	43,306	64,490	93,776
2054	43,116	64,715	94,844
2055	42,924	64,940	95,930
2056	42,736	65,172	97,042
2057	42,544	65,400	98,162
2058	42,349	65,625	99,295
2059	42,150	65,844	100,432
2060	41,941	66,051	101,568
2061	41,726	66,248	102,702
2062	41,500	66,430	103,828
2063	41,261	66,593	104,940

Appendix G.2: Motor vehicle projections, Hamilton City 2013-2063

Hamilton City	Low Series	Medium Series	High Series
2013	88,374	89,758	91,261
2014	89,330	91,735	94,193
2015	90,324	93,764	97,210
2016	91,338	95,832	100,300
2017	92,219	97,878	103,499
2018	93,139	99,989	106,810
2019	94,088	102,157	110,224
2020	95,053	104,368	113,726
2021	96,030	106,619	117,316
2022	97,053	108,979	121,103
2023	98,078	111,373	124,978
2024	99,106	113,803	128,947
2025	100,121	116,256	133,001
2026	101,102	118,707	137,110
2027	102,015	121,190	141,391
2028	102,900	123,677	145,741
2029	103,752	126,162	150,150
2030	104,559	128,628	154,602
2031	105,339	131,095	159,117
2032	105,901	132,520	161,744
2033	106,417	133,902	164,344
2034	106,877	135,230	166,909
2035	107,298	136,519	169,450
2036	107,678	137,768	171,966
2037	108,031	138,988	174,464
2038	108,349	140,170	176,933
2039	108,628	141,307	179,364
2040	108,873	142,405	181,762
2041	109,073	143,451	184,113
2042	109,214	144,429	186,400
2043	109,311	145,355	188,642
2044	109,381	146,252	190,864
2045	109,419	147,114	193,061
2046	109,433	147,947	195,238
2047	109,393	148,719	197,356
2048	109,303	149,430	199,417
2049	109,175	150,096	201,436
2050	109,001	150,708	203,408
2051	108,791	151,277	205,343
2052	108,544	151,803	207,242
2053	108,263	152,290	209,113
2054	107,957	152,745	210,956
2055	107,641	153,188	212,799
2056	107,294	153,592	214,609
2057	106,920	153,967	216,404
2058	106,522	154,316	218,186
2059	106,085	154,621	219,939
2060	105,618	154,894	221,674
2061	105,112	155,120	223,371
2062	104,565	155,295	225,025
2063	103,971	155,416	226,634

Appendix G.3: Motor vehicle projections, Waipa District 2013-2063

Waipa District	Low Series	Medium Series	High Series
2013	27,840	28,276	28,749
2014	27,939	28,714	29,506
2015	28,065	29,179	30,297
2016	28,216	29,670	31,124
2017	28,340	30,168	31,997
2018	28,487	30,695	32,914
2019	28,645	31,241	33,865
2020	28,812	31,807	34,854
2021	28,977	32,380	35,869
2022	29,157	32,990	36,951
2023	29,334	33,607	38,060
2024	29,500	34,223	39,189
2025	29,657	34,840	40,338
2026	29,793	35,442	41,491
2027	29,897	36,039	42,682
2028	29,991	36,631	43,884
2029	30,077	37,218	45,097
2030	30,156	37,803	46,323
2031	30,221	38,374	47,548
2032	30,227	38,637	48,196
2033	30,219	38,880	48,822
2034	30,187	39,091	49,411
2035	30,138	39,278	49,969
2036	30,066	39,432	50,486
2037	29,968	39,551	50,962
2038	29,840	39,629	51,385
2039	29,685	39,668	51,758
2040	29,507	39,674	52,086
2041	29,304	39,642	52,363
2042	29,078	39,577	52,595
2043	28,838	39,486	52,789
2044	28,588	39,377	52,957
2045	28,330	39,251	53,099
2046	28,060	39,106	53,210
2047	27,782	38,947	53,302
2048	27,499	38,778	53,380
2049	27,209	38,595	53,438
2050	26,909	38,400	53,482
2051	26,605	38,198	53,519
2052	26,306	38,000	53,562
2053	26,012	37,807	53,610
2054	25,728	37,629	53,683
2055	25,454	37,463	53,774
2056	25,191	37,311	53,885
2057	24,935	37,169	54,013
2058	24,676	37,025	54,147
2059	24,421	36,886	54,291
2060	24,165	36,746	54,440
2061	23,916	36,614	54,603
2062	23,668	36,483	54,771
2063	23,407	36,334	54,920