

Population, family and household, and labour force projections for the Waikato region, 2013-2063 (2015 update)

Prepared by:
Michael P. Cameron
William Cochrane
University of Waikato

For:
Waikato Regional Council
Private Bag 3038
Waikato Mail Centre
HAMILTON 3240

July 2015

Document #: 3452327

Peer Reviewed by:
Dr Tom Wilson,
Advanced Demographic
Modelling, Queensland Date July 2015

Approved for release by:
Dr Beat Huser Date July 2015

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THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

**Population, Family and Household,
and Labour Force Projections
for the Waikato Region, 2013-2063
(2015 Update)**

Michael P. Cameron ^{a,b}

William Cochrane ^{b,c}

^a Department of Economics, University of Waikato

^b National Institute of Demographic and Economic Analysis, University of Waikato

^c Faculty of Arts and Social Sciences, University of Waikato

Commissioned Research Report

Prepared for Waikato Regional Council

Updated July 2015

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Any queries regarding this report should be addressed to:

Dr. Michael P. Cameron
Department of Economics
University of Waikato
Private Bag 3105
Hamilton 3240
E-mail: mcam@waikato.ac.nz
Phone: +64 7 858 5082.

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Acknowledgements

We thank Statistics New Zealand for providing much of the data used to generate these demographic projections. We also thank Sialupapu Siameja for research assistance, Natalie Jackson and Jacques Poot for helpful guidance, and Beat Huser, James Bevan, Ken Tremaine, Michael Spurr, Gary Knighton, Vishal Ramdumy, Anton Marais, Garry McDonald, and participants at two stakeholder workshops for comments on interim projections.

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The University of Waikato
Private Bag 3105
Hamilton
New Zealand

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1. Introduction

The Waikato Regional Council (WRC) approached the University of Waikato in early 2015 with a request to update the Territorial Authority (TA) level population, household and labour force projections for the Waikato Region undertaken in 2014 (Cameron and Cochrane, 2014). The 2014 projections used as a base population the 2013 Estimated Usually Resident Populations (EURPs) estimated by Statistics New Zealand before data from the 2013 Census of Population and Dwellings was fully released. The subsequent revised 2013 EURPs released by Statistics New Zealand in 2014 differed markedly for some of the TAs in the Waikato region.

The projections for the Waikato Region would use the Whole-of-Waikato population model which is both incorporated into, and can be run separately from, the Waikato Integrated Scenario Explorer (WISE) model (Rutledge *et al.*, 2008; 2010). The WISE model is a systems-based integrated model that incorporates economic, demographic, and environmental components across the entire Waikato Region.

The goal of this project was to update the population, household and labour force projections, following the same methods employed in Cameron and Cochrane (2014), and developed by Cameron *et al.* (2008). The assumptions for fertility and mortality would be updated to be consistent with those used in the 2013-base subnational population projections produced by Statistics New Zealand, while the net migration assumptions would be re-calibrated based on changes in the population growth rate between 2006-2013 (which in turn were based on the EURPs in 2006 and 2013). This report briefly summarises the NIDEA 2015-update population projections for TAs in the Waikato Region, and should be read alongside Cameron and Cochrane (2014), which details the methodology employed. The resulting population, household and labour force projections are provided in an electronic appendix only (on request available from the Waikato Regional Council).

In the simplest terms, the differences between the 2014 projections and the 2015 update can be summarised as follows. Both sets of projections follow identical methodologies, so the entirety of the difference is explained by the input data. The major change in input data is the estimated resident populations (ERPs) for June 2013, which were initially released by Statistics New Zealand in 2013 (and used in the 2014 projections), then updated in 2014 (and used in the 2015 updated projections). This leads to a different starting point (base population)

for the projections. The ERPs are also used to estimate migration between Censuses. So a large upward revision of the ERPs leads to a large upward revision of past migration. Future migration is projected on the basis of past migration, so large upward revisions in the ERPs also lead to large revisions in projected future migration.

The remainder of the report is structured as follows:

- Section 2 details the changes in the base populations, fertility, mortality (survivorship), and net migration assumptions, between the 2014 projections and the 2015 update;
- Section 3 summarises the resulting differences in population projections between the 2014 projections and the 2015 update, and compares both projections with the 2013-base subnational population projections produced by Statistics New Zealand; and
- Section 4 concludes.

2. Changes in Projection Assumptions between the 2014 Projections and the 2015 Update

2.1 Changes in Base Populations

Table 1 summarises the changes in base populations (in total) between the 2014 projections and the 2015 update. The 2014 projections (Cameron and Cochrane, 2014) used the EURPs produced in 2013 by Statistics New Zealand, whereas the 2015 update used the revised EURPs released by Statistics New Zealand in 2014. Note that those parts of Waitomo, Taupo and Rotorua Districts that are not within the Waikato Region are excluded from the base populations, as per Cameron and Cochrane (2014).

The EURPs produced by Statistics New Zealand in 2013 were based on the 2006 Census of Population and Dwellings, adjusted for estimated births, deaths, and net migration over the more than seven years following that Census. In contrast, the revised EURPs released in 2014 were based on the 2013 Census and represent the best estimate of all people who usually resided in each TA at 30 June 2013. The revised EURPs were derived “using the ‘census usually resident population count’ adjusted for net census undercount, residents temporarily overseas, and births, deaths, and migration between census night (5 March 2013) and the 30 June 2013 reference date” (Statistics New Zealand, 2014b, p.5). At the national level, the total adjustment from the Census Usually Resident Population (CURP) to the 30 June 2013

EURP was 200,100, made up of estimated net census undercount of 104,200 (52.1%), estimated residents temporarily overseas of 81,700 (40.8%), and population change and demographic reconciliation of 14,100 (7.0%) (Statistics New Zealand, 2014b). The net census undercount was estimated at the regional level using the 2013 Post-enumeration Survey (Statistics New Zealand, 2014a), then allocated to individual TAs based on a hierarchical Bayesian approach that also depends on age, sex, and ethnic composition of each TA (Statistics New Zealand, 2014b). Residents temporarily overseas were allocated to TAs based primarily on international travel and migration data, while population change and demographic reconciliation were based on vital statistics and other data (Statistics New Zealand, 2014a).

Table 1: Changes in Base Populations between the 2014 Projections and the 2015 Update

Territorial Authority	2013 Base Population		Difference	
	2014 proj.	2015 update	Number	%
Thames-Coromandel	27,030	27,340	+310	+1.1%
Hauraki	18,730	18,620	-110	-0.6%
Waikato District	64,910	66,530	+1,620	+2.5%
Matamata-Piako	32,210	32,910	+700	+2.2%
Hamilton City	147,290	150,180	+2,890	+2.0%
Waipa	46,400	48,660	+2,260	+4.9%
Otorohanga	9,340	9,610	+270	+2.9%
South Waikato	22,530	23,190	+660	+2.9%
Waitomo	9,300	9,295	-5	-0.1%
Taupo	34,150	34,585	+435	+1.3%
Rotorua (part)	3,625	3,820	+205	+5.4%
Total	415,515	424,740	+9,225	+2.2%

The differences between the original base populations and the revised base populations are in some cases quite substantial. In total, the revised base population is 9,225 (or 2.2 percent) higher. The largest revisions in absolute population numbers were for Hamilton City (+2,890), Waipa District (+2,260), and Waikato District (+1,620). The largest revisions in percentage terms were for part-Rotorua District (+5.4%), Waipa District (+4.9%), and Otorohanga District (+2.9%). As these base populations were used in the calibration of net migration rates, these changes can be expected to flow through to changes in net migration (see Section 2.4), with the TAs with the largest percentage changes in base population having the largest changes in net migration assumptions.

2.2 Changes in Fertility Assumptions

Table 2 summarises the changes in fertility assumptions (measured as the total fertility rate, i.e. the total number of births per woman of childbearing age) between the 2014 projections and the 2015 update. Both the 2014 projections and 2015 update used total fertility rates estimated by Statistics New Zealand. The 2014 projections used the total fertility rate series from the 2006-base subnational population projections, which extended only to 2031 (after which the total fertility rate was assumed to remain constant). In contrast, the 2015 update used the total fertility rate series from the 2013-base subnational population projections, which extend to 2043 (after which the total fertility rate is assumed to remain constant).

The differences between the original fertility assumptions and the revised fertility assumptions are not large in most cases. The 2013 assumed total fertility rates are lower for all TAs, and the 2043 assumed total fertility rates are lower for all TAs except Thames-Coromandel District, Matamata-Piako District, South Waikato District, and Rotorua District. The largest changes in 2043 are observed for Hauraki District (-0.17 births per woman of childbearing age), Waikato District (-0.16), and Waipa District (-0.11). These lower fertility assumptions are likely to accelerate the rate of ageing, and lower population growth rates in the 2015 update for these TAs, compared with the 2014 projections.

Table 2: Changes in Fertility Assumptions between the 2014 Projections and the 2015 Update

Territorial Authority	2013 Total Fertility Rate			2043 Total Fertility Rate		
	2014 proj.	2015 update	Difference	2014 proj.	2015 update	Difference
Thames-Coromandel	2.25	2.23	-0.02	2.08	2.14	+0.06
Hauraki	2.64	2.38	-0.26	2.44	2.27	-0.17
Waikato District	2.54	2.29	-0.25	2.35	2.19	-0.16
Matamata-Piako	2.44	2.43	-0.01	2.26	2.32	+0.06
Hamilton City	2.06	1.96	-0.10	1.90	1.88	-0.02
Waipa	2.30	2.10	-0.20	2.12	2.01	-0.11
Otorohanga	2.64	2.49	-0.15	2.44	2.36	-0.08
South Waikato	2.79	2.72	-0.07	2.57	2.58	+0.01
Waitomo	2.64	2.49	-0.15	2.44	2.36	-0.08
Taupo	2.39	2.23	-0.16	2.21	2.14	-0.07
Rotorua (part)	2.44	2.38	-0.06	2.26	2.27	+0.01

2.3 Changes in Mortality (Survivorship) Assumptions

Table 3 summarises the changes in mortality (survivorship) assumptions (measured as the life expectancy at birth for men (M) and women (F)) between the 2014 projections and the 2015 update. Both the 2014 projections and 2015 update used life expectancy at birth estimated by Statistics New Zealand. The 2014 projections used the life expectancy series from the 2006-base subnational population projections, which extended only to 2031 (after which the life expectancy was assumed to remain constant). In contrast, the 2015 update used the life expectancy series from the 2013-base subnational population projections, which extend to 2043 (after which the life expectancy is assumed to remain constant).

The differences between the original mortality assumptions and the revised mortality assumptions are fairly consistent across all TAs, with most life expectancies increased by

around 2.4 years. Much of this difference arises because in the 2014 projections, the increases in life expectancy over time were assumed to cease in 2031, whereas in the 2015 update increases in life expectancy continue until 2043. Some of the TA-level differences stand out, with Otorohanga and Waikato Districts increasing life expectancy by more, and Taupo District increasing life expectancy by less, than the other TAs. Higher (lower) projected life expectancy will be associated with higher (lower) population growth rates in the 2015 update, compared with the 2014 projections.

Table 3: Changes in Mortality (Survivorship) Assumptions between the 2014 Projections and the 2015 Update

Territorial Authority	2013 Life Expectancy			2043 Life Expectancy		
	2014 proj.	2015 update	Difference	2014 proj.	2015 update	Difference
Thames-Coromandel	M: 79.0 F: 82.5	M: 78.9 F: 82.8	M: -0.1 F: +0.3	M: 82.6 F: 85.7	M: 84.9 F: 88.1	M: +2.3 F: +2.4
Hauraki	M: 78.7 F: 82.2	M: 78.3 F: 82.2	M: -0.4 F: +0.0	M: 82.3 F: 85.4	M: 84.3 F: 87.5	M: +2.0 F: +2.3
Waikato District	M: 77.9 F: 81.5	M: 78.3 F: 82.2	M: +0.4 F: +0.7	M: 81.6 F: 84.7	M: 84.3 F: 87.5	M: +2.7 F: +2.8
Matamata-Piako	M: 79.3 F: 82.8	M: 79.7 F: 83.4	M: +0.4 F: +0.6	M: 83.0 F: 86.0	M: 85.5 F: 88.7	M: +2.5 F: +2.7
Hamilton City	M: 79.3 F: 82.8	M: 79.2 F: 83.1	M: -0.1 F: +0.3	M: 82.9 F: 86.0	M: 85.2 F: 88.4	M: +2.3 F: +2.4
Waipa	M: 79.6 F: 83.1	M: 79.7 F: 83.4	M: +0.1 F: +0.3	M: 83.3 F: 86.3	M: 85.5 F: 88.7	M: +2.2 F: +2.4
Otorohanga	M: 79.8 F: 83.3	M: 80.5 F: 84.3	M: +0.7 F: +1.0	M: 83.5 F: 86.5	M: 86.4 F: 89.6	M: +2.9 F: +3.1
South Waikato	M: 77.0 F: 80.6	M: 77.0 F: 80.8	M: +0.0 F: +0.2	M: 80.7 F: 83.8	M: 83.1 F: 86.3	M: +2.4 F: +2.5
Waitomo	M: 76.0 F: 79.6	M: 76.0 F: 80.0	M: +0.0 F: +0.4	M: 79.8 F: 83.0	M: 82.1 F: 85.4	M: +2.3 F: +2.4
Taupo	M: 78.6 F: 82.1	M: 77.6 F: 81.4	M: -1.0 F: -0.7	M: 82.3 F: 85.4	M: 83.7 F: 86.9	M: +1.4 F: +1.5
Rotorua (part)	M: 77.3 F: 80.9	M: 77.3 F: 81.1	M: +0.0 F: +0.2	M: 81.0 F: 84.2	M: 83.4 F: 86.6	M: +2.4 F: +2.4

2.4 Changes in Net Migration Assumptions

The net migration assumptions in the 2014 projections (Cameron and Cochrane, 2014) were based on inter-Censal net migration estimates, and the uncalibrated net migration estimates are unchanged for the 2015 update. However, the projection methodology includes a calibration, where the net migration profile is modified to more closely match expected future population trends. As explained in Cameron and Cochrane (2014, p.8-9):

“The process of calibration was undertaken using a combination of expert judgement and stakeholder engagement. An interim set of projections was first developed using a weighted average of the four population growth rates between each inter-censal period between 1991 and 2013 as an initial calibration guide. The weighted average that was applied was based on the mean weighted average applied in population projections developed for Smart Growth for the Bay of Plenty region (Jackson *et al.*, 2014b), thereby ensuring alignment between the projections for the Bay of Plenty and Waikato regions... 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... The result of the calibration is that the population projections were weighted to more closely reflect the experience of each TA in the most recent inter-Censal period, from 2006-2013. The greatest weighting towards the most recent experience was for Waikato District, and the least weighting towards that period was for Thames-Coromandel District, Hauraki District, and Matamata-Piako District.”

Such 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. As noted above, the calibration process used the inter-Censal trends in the EURP for each TA, in combination with end-user input. Given that the calibration placed a greater weight on most recent experience for every TA, this means that those TAs which had the greatest revision in EURP would also have the greatest revision in net migration. Table 4 summarises the resulting changes in net migration between the 2014 projections and the 2015 update.

With the exception of Hauraki District and Rotorua District, the 2015 update has higher net migration across all TAs, when compared to the 2014 projections. The largest differences in absolute terms arise in Hamilton City, Waipa District, and Waikato District, which also had

the largest revisions in base population (which as noted above, will have flowed through to the net migration during the calibration process). South Waikato and Taupo Districts also have substantial absolute increases in net migration. Higher net migration in these areas will be associated with higher population growth rates in the 2015 update, compared with the 2014 projections, and in the cases of Hamilton City, Waipa District and Waikato District, the population growth rates will be substantially higher.

Table 4: Changes in Net Migration between the 2014 Projections and the 2015 Update

Territorial Authority	2013 Net Migration			2014 Net Migration		
	2014 proj.	2015 update	Difference	2014 proj.	2015 update	Difference
Thames-Coromandel	+76	+140	+64	+49	+59	+10
Hauraki	-48	-76	-28	-19	-24	-5
Waikato District	+260	+572	+312	+180	+638	+458
Matamata-Piako	-122	-68	+54	-171	-133	+38
Hamilton City	+387	+825	+438	+623	+1290	+667
Waipa	+121	+433	+312	+36	+494	+458
Otorohanga	-121	-91	+30	-111	-80	+31
South Waikato	-417	-252	+165	-263	-198	+65
Waitomo	-149	-121	+28	-97	-89	+8
Taupo	-14	+65	+79	-74	+12	+86
Rotorua (part)	-23	-25	-2	-24	-27	-3
Total	-50	+1402	+1452	+129	+1942	+1813

3. Comparisons between the 2014 Projections and 2015 Update

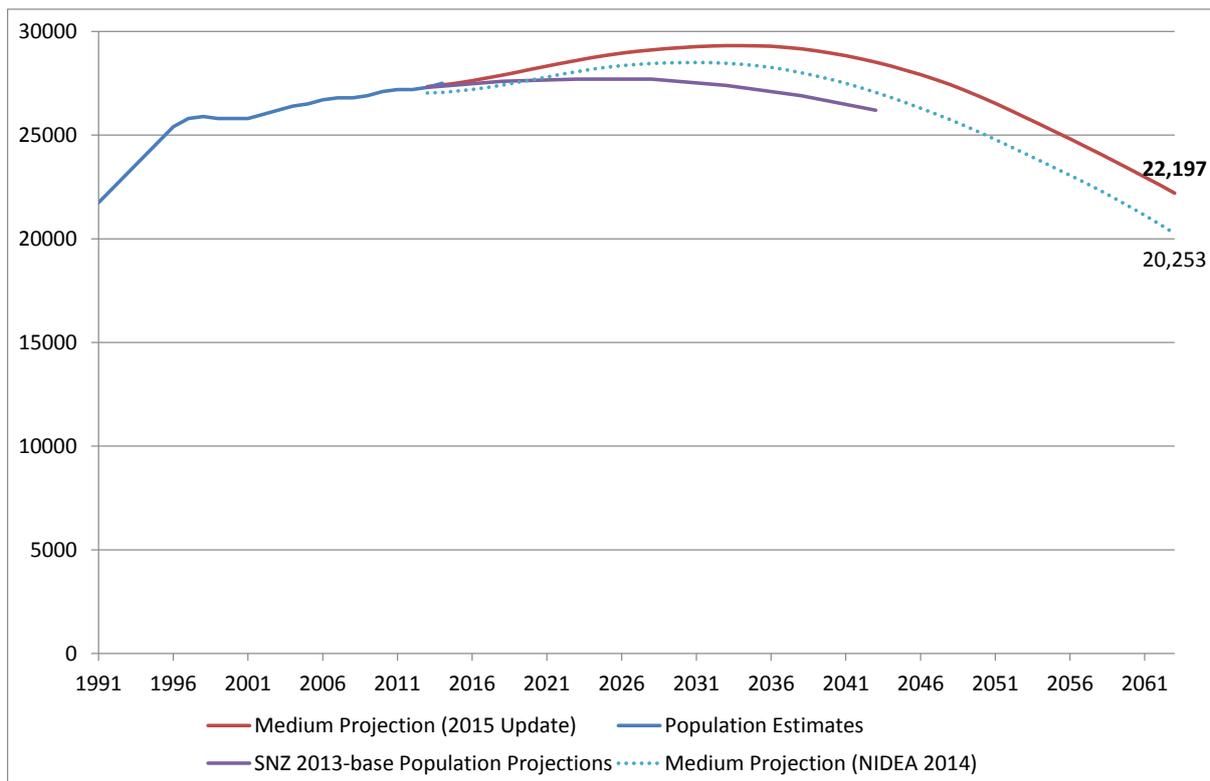
This section summarises the resulting differences in population projections between the 2014 projections and the 2015 update, and compares both projections with the 2013-base subnational population projections produced by Statistics New Zealand. All projections are presented in diagrammatic form, and only for total population. A summary table is included as Appendix Table 1. Tables showing the population projections numerically in total and broken down by five-year-age-group and sex are included in an electronic appendix, and also available using the Waikato Integrated Scenario Explorer Software (Rutledge *et al.*, 2008; 2010). Tables showing the family and household projections numerically are also included as an electronic appendix.

3.1 Population Projections for Thames-Coromandel District

Figure 1 presents the three population projections (NIDEA 2014 medium projection; NIDEA 2015 update; and Statistics New Zealand 2013-base projection) for Thames-Coromandel District to 2063, along with historical population estimates from Statistics New Zealand back to 1991.

Under the NIDEA 2014 medium population projection scenario, the population increases from 27,030 in 2013 to a peak of 28,499 in 2031 before declining to 20,253 in 2063. The 2015 updated projection increases from 27,340 in 2013 to a peak of 29,316 in 2034 before declining to 22,197 in 2063. The moderately higher 2015-update projection reflects a higher base population, and slightly higher fertility, life expectancy, and net migration. Both NIDEA projections are generally higher than the Statistics New Zealand 2013-base projection.

Figure 1: Population projections for Thames-Coromandel District, 2013-2063

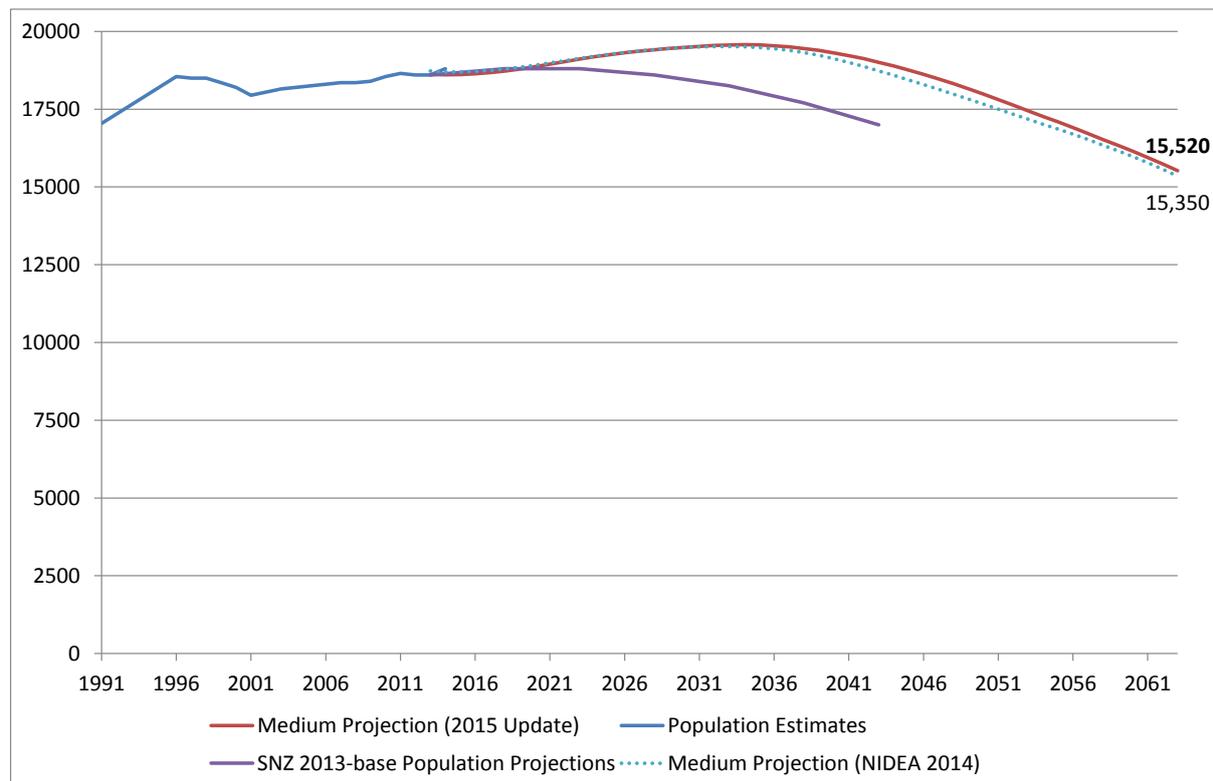


3.2 Population Projections for Hauraki District

Figure 2 presents the three population projections (NIDEA 2014 medium projection; NIDEA 2015 update; and Statistics New Zealand 2013-base projection) for Hauraki District to 2063, along with historical population estimates from Statistics New Zealand back to 1991.

Under the NIDEA 2014 medium population projection scenario, the population increases from 18,730 in 2013 to a peak of 19,512 in 2032 before declining to 15,350 in 2063. The 2015 updated projection increases from 18,620 in 2013 to a peak of 19,572 in 2034 before declining to 15,520 in 2063. The slightly higher 2015-update projection reflects a slightly higher base population, and slightly higher life expectancy, offset by slightly lower fertility and net migration. Both NIDEA projections are higher than the Statistics New Zealand 2013-base projection from about 2020 onwards.

Figure 2: Population projections for Hauraki District, 2013-2063

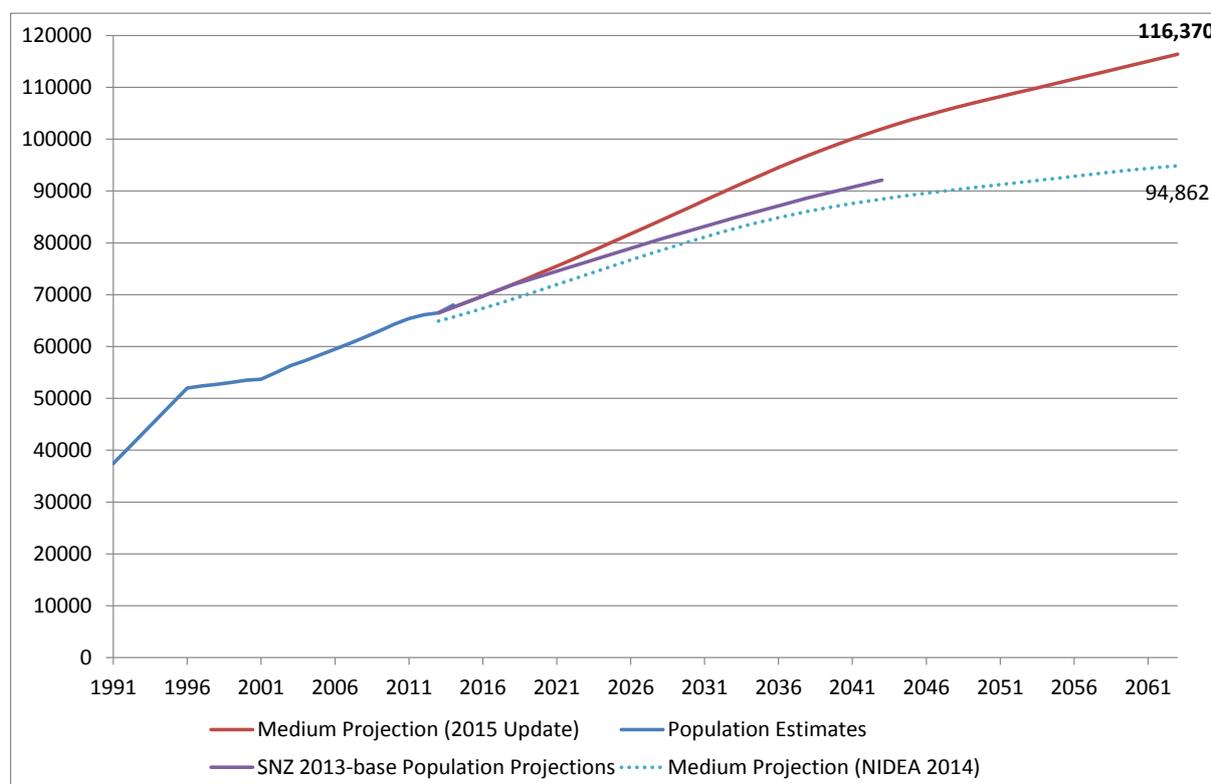


3.3 Population Projections for Waikato District

Figure 3 presents the three population projections (NIDEA 2014 medium projection; NIDEA 2015 update; and Statistics New Zealand 2013-base projection) for Waikato District to 2063, along with historical population estimates from Statistics New Zealand back to 1991.

Under the NIDEA 2014 medium population projection scenario, the population increases over the entire projection period, from 64,910 in 2013 to 94,862 in 2063. The 2015 updated projection increases from 66,530 in 2013 to 116,370 in 2063. The substantially higher 2015-update projection reflects a much higher base population and net migration, as well as slightly higher life expectancy, offset by slightly lower fertility. The NIDEA 2014 projection is slightly below than the SNZ 2013-base projection over the entire projection period, while the NIDEA 2015-update projection is higher than the SNZ projection from about 2018 onwards.

Figure 3: Population projections for Waikato District, 2013-2063

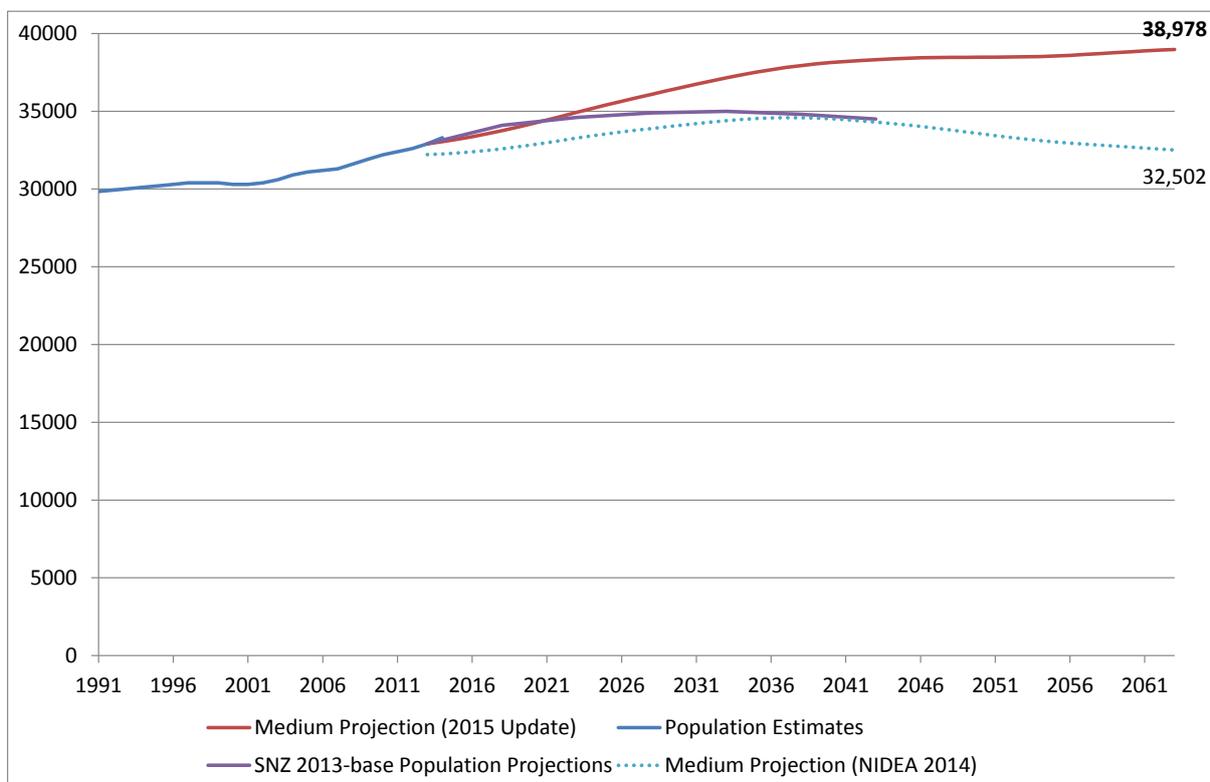


3.4 Population Projections for Matamata-Piako District

Figure 4 presents the three population projections (NIDEA 2014 medium projection; NIDEA 2015 update; and Statistics New Zealand 2013-base projection) for Matamata-Piako District to 2063, along with historical population estimates from Statistics New Zealand back to 1991.

Under the NIDEA 2014 medium population projection scenario, the population increases from 32,210 in 2013 to a peak of 34,588 in 2037 before declining to 32,502 in 2063. The 2015 updated projection increases over the entire projection period, from 32,910 in 2013 to 38,978 in 2063. The substantially higher 2015-update projection reflects a much higher base population, as well as slightly higher fertility, life expectancy, and net migration. The NIDEA 2014 projection is slightly below than the SNZ 2013-base projection over the entire projection period, while the NIDEA 2015-update projection is higher than the SNZ projection from about 2018 onwards.

Figure 4: Population projections for Matamata-Piako District, 2013-2063

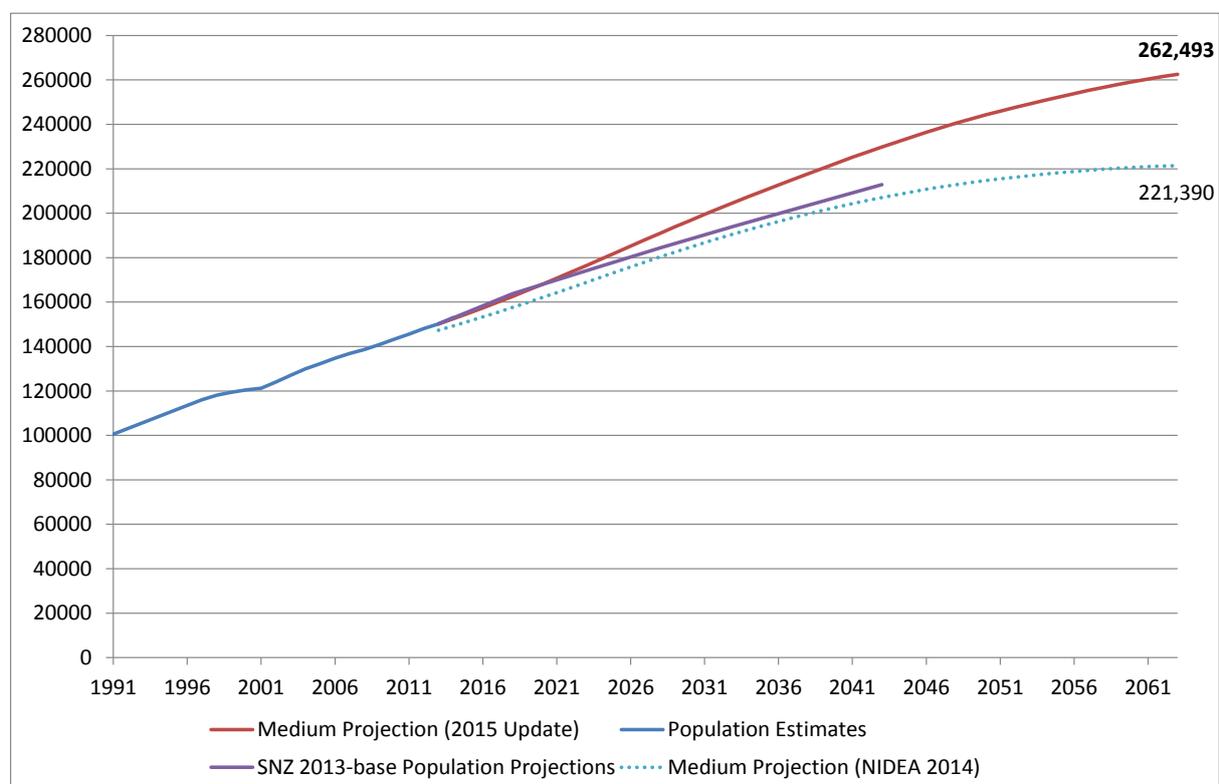


3.5 Population Projections for Hamilton City

Figure 5 presents the three population projections (NIDEA 2014 medium projection; NIDEA 2015 update; and Statistics New Zealand 2013-base projection) for Hamilton City to 2063, along with historical population estimates from Statistics New Zealand back to 1991.

Under the NIDEA 2014 medium population projection scenario, the population increases over the entire projection period, from 147,290 in 2013 to 221,390 in 2063. The 2015 updated projection increases from 150,180 in 2013 to 262,493 in 2063. The substantially higher 2015-update projection reflects a much higher base population and net migration, as well as slightly higher life expectancy, offset by slightly lower fertility. The NIDEA 2014 projection is slightly below than the SNZ 2013-base projection over the entire projection period, while the NIDEA 2015-update projection is higher than the SNZ projection from about 2021 onwards.

Figure 5: Population projections for Hamilton City, 2013-2063

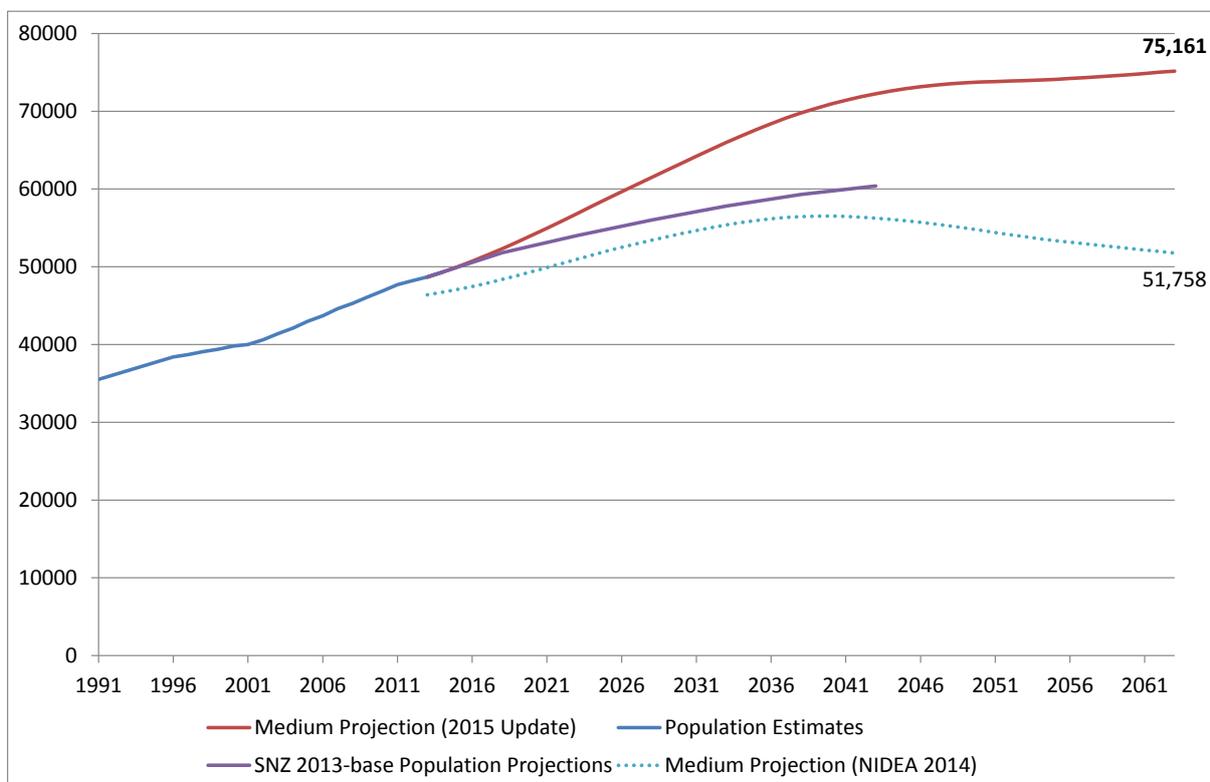


3.6 Population Projections for Waipa District

Figure 6 presents the three population projections (NIDEA 2014 medium projection; NIDEA 2015 update; and Statistics New Zealand 2013-base projection) for Waipa District to 2063, along with historical population estimates from Statistics New Zealand back to 1991.

Under the NIDEA 2014 medium population projection scenario, the population increases from 46,400 in 2013 to a peak of 56,515 in 2040 before declining to 51,758 in 2063. The 2015 updated projection increases over the entire projection period, from 48,660 in 2013 to 75,161 in 2063. The substantially higher 2015-update projection reflects a much higher base population and net migration, as well as slightly higher life expectancy, offset by slightly lower fertility. The NIDEA 2014 projection is slightly below than the SNZ 2013-base projection over the entire projection period, while the NIDEA 2015-update projection is higher than the SNZ projection from about 2018 onwards.

Figure 6: Population projections for Waipa District, 2013-2063

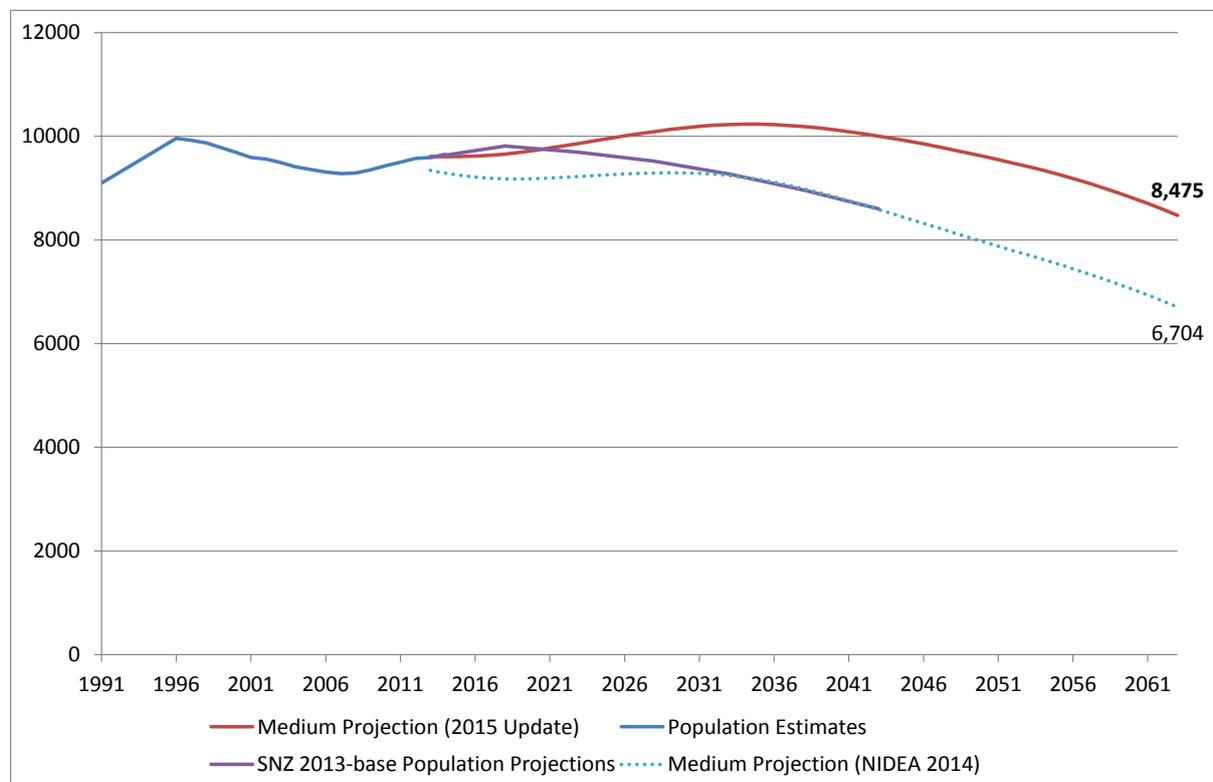


3.7 Population Projections for Otorohanga District

Figure 7 presents the three population projections (NIDEA 2014 medium projection; NIDEA 2015 update; and Statistics New Zealand 2013-base projection) for Otorohanga District to 2063, along with historical population estimates from Statistics New Zealand back to 1991.

Under the NIDEA 2014 medium population projection scenario, the population initially decreases from 9,340 in 2013 to 9,175 in 2019, before increasing to a peak of 9,295 in 2029, then declining to 6,704 in 2063. The 2015 updated projection increases from 9,610 in 2013 to a peak of 10,233 in 2035 before declining to 8,475 in 2063. The higher 2015-update projection reflects a higher base population and net migration, as well as slightly higher life expectancy, offset by slightly lower fertility. The NIDEA 2014 projection is initially slightly below than the SNZ 2013-base projection before following a very similar trajectory from 2033 onwards, while the NIDEA 2015-update projection is higher than the SNZ projection from about 2021 onwards.

Figure 7: Population projections for Otorohanga District, 2013-2063

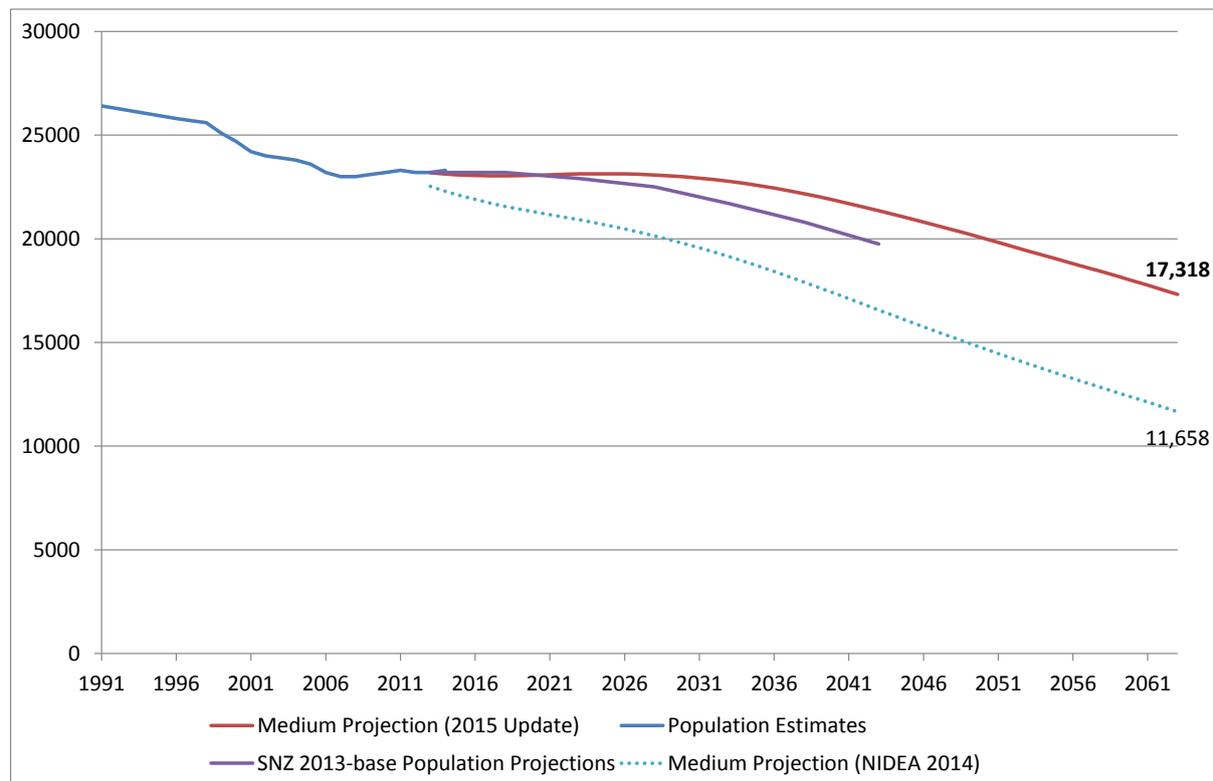


3.8 Population Projections for South Waikato District

Figure 8 presents the three population projections (NIDEA 2014 medium projection; NIDEA 2015 update; and Statistics New Zealand 2013-base projection) for South Waikato District to 2063, along with historical population estimates from Statistics New Zealand back to 1991.

Under the NIDEA 2014 medium population projection scenario, the population decreases from 22,530 in 2013 to 11,658 in 2063. The 2015 updated projection decreases from 23,190 in 2013 to 17,318 in 2063. The substantially higher 2015-update projection reflects a higher base population and net migration, as well as slightly higher life expectancy and fertility. The NIDEA 2014 projection is substantially below than the SNZ 2013-base projection over the entire projection period, while the NIDEA 2015-update projection is higher than the SNZ projection from about 2020 onwards.

Figure 8: Population projections for South Waikato District, 2013-2063

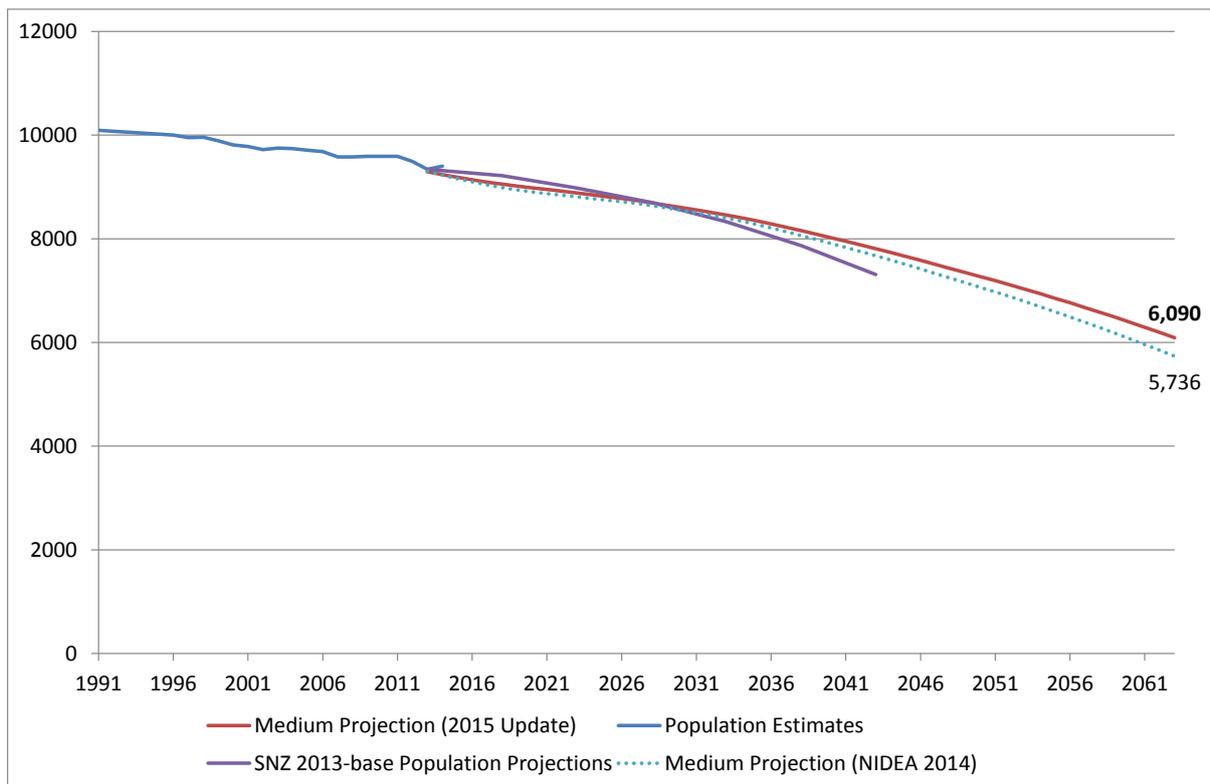


3.9 Population Projections for Waitomo District

Figure 8 presents the three population projections (NIDEA 2014 medium projection; NIDEA 2015 update; and Statistics New Zealand 2013-base projection) for Waitomo District to 2063, along with historical population estimates from Statistics New Zealand back to 1991.

Under the NIDEA 2014 medium population projection scenario, the population decreases from 9,300 in 2013 to 5,376 in 2063. The 2015 updated projection decreases from 9,295 in 2013 to 6,090 in 2063. The slightly higher 2015-update projection reflects a similar base population, slightly higher life expectancy and net migration, offset by slightly lower fertility. Both the NIDEA 2014 projection and 2015-update projection are slightly below than the SNZ 2013-base projection until about 2028 after which they are slightly higher than the SNZ projection.

Figure 9: Population projections for Waitomo District, 2013-2063

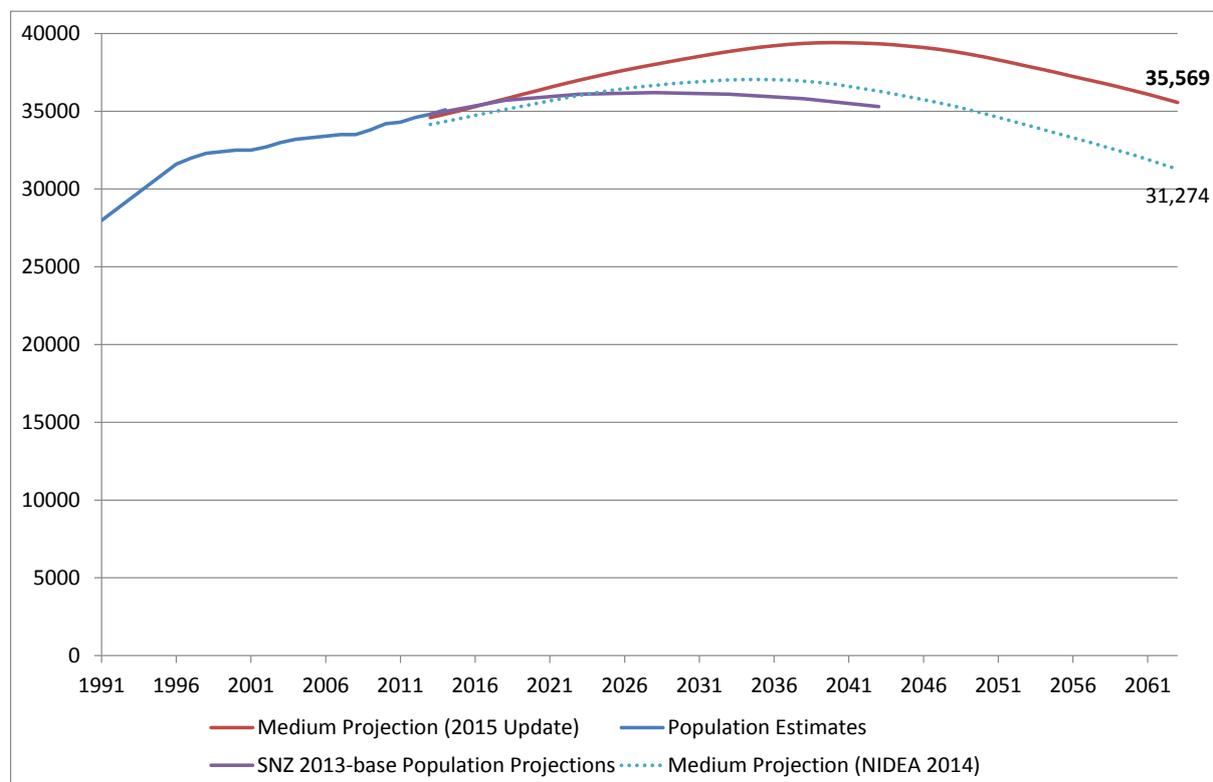


3.10 Population Projections for Taupo District

Figure 10 presents the three population projections (NIDEA 2014 medium projection; NIDEA 2015 update; and Statistics New Zealand 2013-base projection) for Taupo District to 2063, along with historical population estimates from Statistics New Zealand back to 1991.

Under the NIDEA 2014 medium population projection scenario, the population increases from 34,150 in 2013 to a peak of 37,046 in 2035 before declining to 31,274 in 2063. The 2015 updated projection increases from 34,585 in 2013 to a peak of 39,148 in 2040 before declining to 35,569 in 2063. The moderately higher 2015-update projection reflects a higher base population, and slightly higher life expectancy and net migration, offset by slightly lower fertility. The NIDEA 2014 projection is slightly below than the SNZ 2013-base projection until about 2022 after which it is higher than the SNZ projection, while the NIDEA 2015-update projection is higher than the SNZ projection from about 2016 onwards.

Figure 10: Population projections for Taupo District, 2013-2063

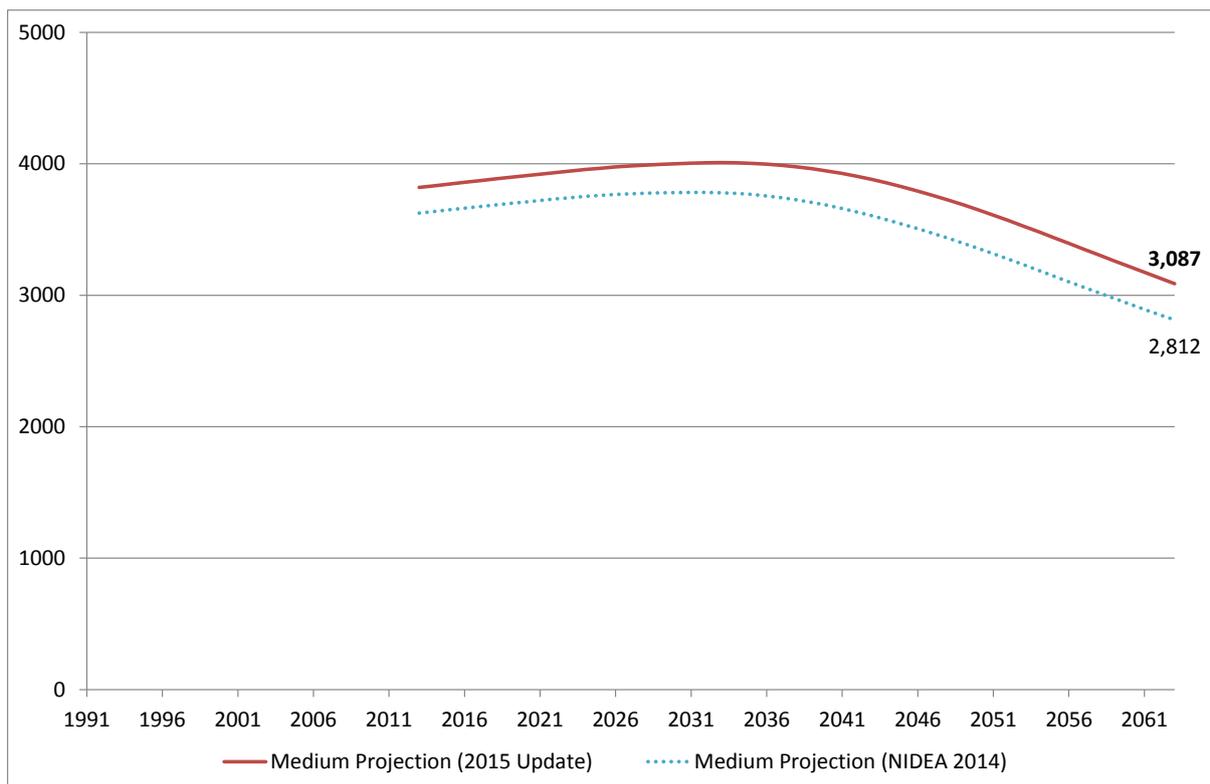


3.11 Population Projections for part-Rotorua District

Figure 11 presents the NIDEA 2014 medium projection and NIDEA 2015 update projection for part-Rotorua District to 2063. There is no corresponding 2013-base SNZ medium projection for the part of Rotorua District that is included in the Waikato Region.

Under the NIDEA 2014 medium population projection scenario, the population increases from 3,625 in 2013 to a peak of 3,783 in 2031 before declining to 2,812 in 2063. The 2015 updated projection increases from 3,820 in 2013 to a peak of 4,009 in 2033 before declining to 3,087 in 2063. The moderately higher 2015-update projection reflects a higher base population and slightly higher life expectancy, offset by slightly lower net migration and little change in fertility.

Figure 11: Population projections for part-Rotorua District, 2013-2063

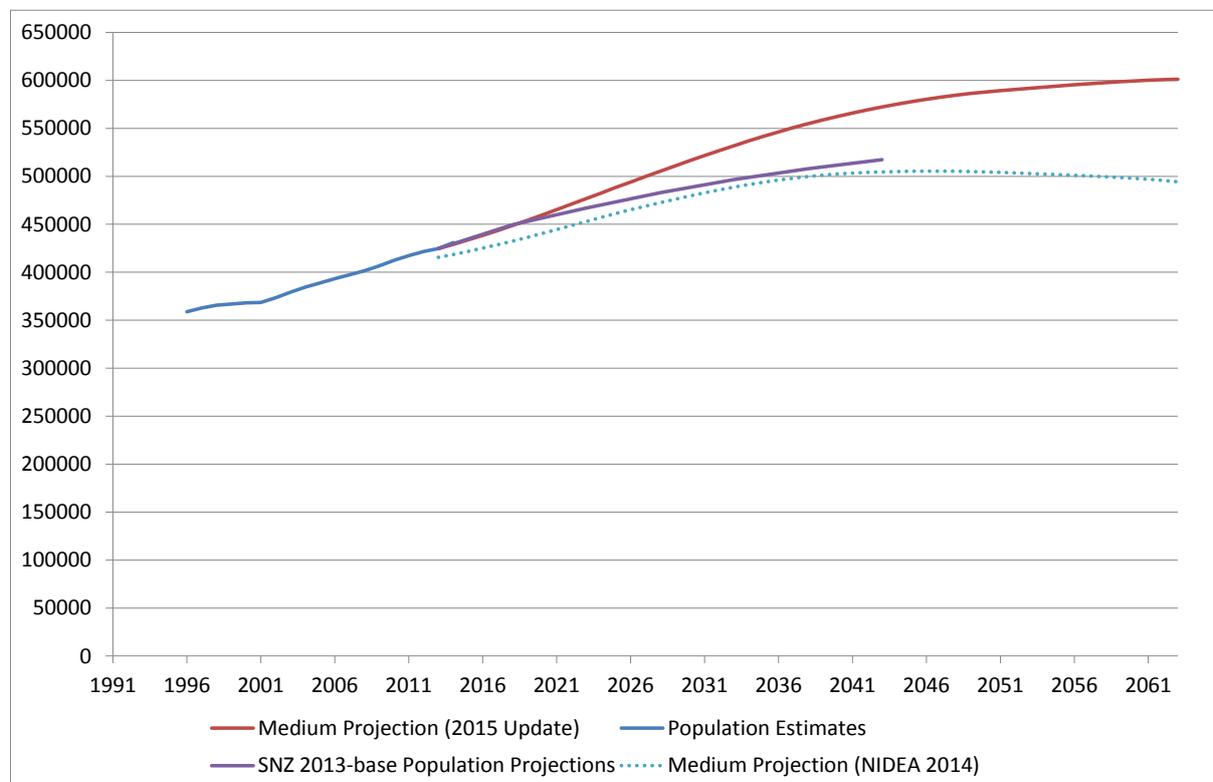


3.12 Population Projections for Waikato Region

Figure 12 presents the three population projections (NIDEA 2014 medium projection; NIDEA 2015 update; and Statistics New Zealand 2013-base projection) for the Waikato Region as a whole to 2063, along with historical population estimates from Statistics New Zealand back to 1996.

Under the NIDEA 2014 medium population projection scenario, the population increases from 415,515 in 2013 to a peak of 505,405 in 2047 before declining to 494,298 in 2063. The 2015 updated projection increases over the entire projection period, from 424,740 in 2013 to 601,259 in 2063. The substantially higher 2015-update projection reflects a much higher base population and net migration for the region as a whole, as well as slightly higher life expectancy, offset by slightly lower fertility. The NIDEA 2014 projection is slightly below than the SNZ 2013-base projection over the entire projection period, while the NIDEA 2015-update projection is higher than the SNZ projection from about 2018 onwards.

Figure 12: Population projections for the Waikato Region, 2013-2063



4. Discussion and Conclusion

This report briefly summarised the changes in assumptions (base population, fertility, mortality (survivorship), and net migration) and resulting population projections between the projections produced by Cameron and Cochrane (2014) and a 2015 update of those projections. The largest differences in the assumptions arise from differences in the base populations used in the projections, which flowed through into differences in net migration – this was most apparent for Waikato District, Waipa District, and Hamilton City. Changes in life expectancy will also have affected the projections, but changes in fertility assumptions were more modest.

Most of the 2015-update projections follow a similar trajectory to the previous projections. However, the projected populations of all TAs in the Waikato Region are higher in 2063 under the 2015-update projections than in the previous projections. The differences are most substantial for Hamilton City (projected population 41,103 higher in 2063 than previously projected), Waipa District (23,403 higher), and Waikato District (21,508 higher). In percentage terms, the differences are largest in South Waikato District (projected population 48.6% higher in 2063 than previously projected), Waipa District (45.2% higher), and Otorohanga District (26.4% higher).

These revised (2015-update) projections more closely reflect the demographic future of the region than the previous projections. This is because they take into account the latest estimates of base population (subsequent to the 2013 Census data release), and up-to-date projections of future mortality and fertility. They also take account of the on-the-ground intelligence of local stakeholders, through the calibration process (see Cameron and Cochrane (2014) for further details). Moreover, New Zealand has been experienced an extended period of historically high international net migration, and this will have flowed through into higher population growth since the 2013 Census.

However, the demographic futures (Myers, 2001) experienced by the component territorial authorities of the Waikato Region cannot be determined with complete accuracy, irrespective of the assumptions or model that is applied to estimate them. All of these areas are faced with a complex and changing national and international environment, and it is not possible to perfectly foresee all of the factors that might impact on future population. However, the updated projections presented in this report should assist planners in better understanding the demographic changes that they are faced with. In short, these projections are simply one tool that should be used in evaluating possible futures for the region.

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Appendix Table 1: Population projections for the Waikato Region, 2013-2063

	2013			2028			2043			2063	
	2014 proj.	2015 update	SNZ	2014 proj.	2015 update	SNZ	2014 proj.	2015 update	SNZ	2014 proj.	2015 update
Thames-Coromandel	27,030	27,340	27,300	28,451	29,108	27,700	27,057	28,514	26,200	20,253	22,197
Hauraki	18,730	18,620	18,600	19,420	19,413	18,600	18,730	19,007	17,000	15,350	15,520
Waikato District	64,910	66,530	66,500	78,513	84,271	80,700	88,456	101,980	92,100	94,862	116,370
Matamata-Piako	32,210	32,910	32,900	33,893	36,087	34,900	34,300	38,314	34,500	32,502	38,978
Hamilton City	147,290	150,180	150,200	180,340	190,998	184,400	207,058	229,794	212,900	221,390	262,493
Waipa	46,400	48,660	48,700	53,414	61,488	56,000	56,247	72,241	60,400	51,758	75,161
Otorohanga	9,340	9,610	9,590	9,290	10,090	9,520	8,585	10,003	8,600	6,704	8,475
South Waikato	22,530	23,190	23,200	20,135	23,076	22,500	16,563	21,353	19,750	11,658	17,318
Waitomo	9,300	9,295	9,340	8,640	8,696	8,700	7,673	7,809	7,310	5,736	6,090
Taupo	34,150	34,585	34,800	36,667	38,010	36,200	36,290	39,335	35,300	31,274	35,569
Rotorua (part)	3,625	3,820	-	3,776	3,990	-	3,604	3,880	-	2,812	3,087
Total	415,515	424,740	424,600	472,539	505,228	482,800	504,563	572,231	517,400	494,298	601,259