



# Annual report on the Public Housing System

As at 30 June 2017

## Appendices

This report has been produced for the Ministry of Social Development

## APPENDIX A      GUIDE TO APPENDICES

The Appendices provide much of the technical detail of our approach. The following table describes the various appendices supplied with the report.

#	Title	Description
A	Guide to Appendices	Describes appendices
B	Further background	Provides links to some background reading referred to in the report
C	Economic assumptions	Details on assumptions used, including inflation, discounting, and unemployment rate
D	Data supplied	Describes the datasets provided by MSD and used in the projection
E	Projection scope	Details the various payment types allowed for
F	Details on modelling approach	Provides further detail on the types of models used in the projection and their explicit parameterisation
G	Model Coefficients <i>[Separate Excel file]</i>	Excel file of parameters for each of the models
H	Actual versus expected comparisons for 2016/17	Tables of actual versus expected experience for the year to 30 June 2017
I	Change in lifetime housing payments since last projection	A segment level reconciliation of the changes from the 2016 to 2017 projection results
J	Sensitivity analysis	A segment level detailing of sensitivity to key projection assumptions
K	Other one-way tables	Showing lifetime housing payments across a number of different dimensions
L	Projected number of clients and payments <i>[Separate Excel file]</i>	Tables detailing the projected number of people in each state and their corresponding payments, over the duration of the projection



## APPENDIX B FURTHER BACKGROUND

### B.1 Benefit system projections

The benefit system is referred to extensively in the public housing system report due to the interdependencies between the two systems. Taylor Fry has been working in partnership with MSD and the Treasury since June 2011 to help develop the investment approach in the benefit system. Further detail is provided in our initial report on the feasibility of an investment approach, and in the six following reports of the benefit system. All six reports are publicly available on MSD's website<sup>1</sup>.

The 2017 benefit system report, not public at the time of writing, is also particularly relevant; it covers the same projection date as the housing projection and the integrated nature of the models mean that many of the comments in that report are relevant to the housing projection population.

### B.2 Public housing and the Social Housing Reform Programme (SHRP)

The report forms part of the New Zealand Government's SHRP. Further background, including cabinet papers, is available at

<http://www.socialhousing.govt.nz/>

There are also a significant number of publications and statistics regarding the public housing system available on both the MSD and HNZC websites. Interested readers can visit:

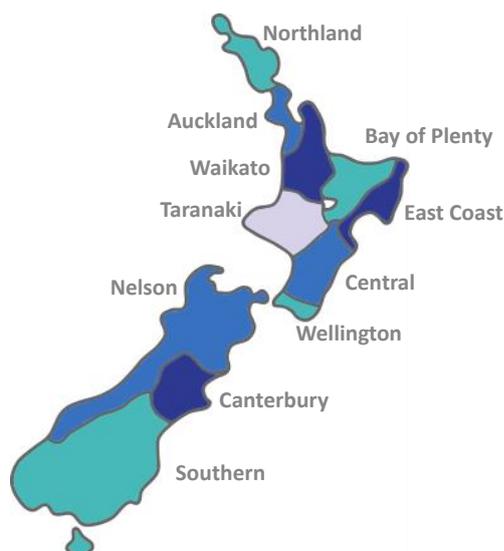
» <http://housing.msd.govt.nz/information-for-housing-providers/register/>

» <http://www.hnzc.co.nz/publications/>

### B.3 Work and Income regions, and Territorial Local Authorities

MSD has 11 regions that it uses to manage its services. These are summarised in the figure below.

**Figure B.1 Work and income regions**



<sup>1</sup> <https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/valuation-reports/index.html>

To give a more granular view of location, this projection models at a Territorial Local Authority (TLA) level (65 of them, excluding Auckland). However, Auckland is a single TLA so we further split this into the 20 local boards. These are all listed in the table below with their associated Work and Income region. Note that these groupings are not entirely exact; some TLAs straddle more than one Work and Income region.

**Table B.1 List of TLAs and Boards plus associated Work & Income region**

Region	TLA/Board	Region	TLA/Board	Region	TLA/Board
Northland	Far North District	Central	Horowhenua District	Southern	Invercargill City
Northland	Kaipara District	Central	Kapiti Coast District	Southern	Mackenzie District
Northland	Whangarei District	Central	Manawatu District	Southern	Queenstown-Lakes District
Waikato	Hamilton City	Central	Masterton District	Southern	Southland District
Waikato	Hauraki District	Central	Palmerston North City	Southern	Timaru District
Waikato	Matamata-Piako District	Central	Rangitikei District	Southern	Waimate District
Waikato	Thames-Coromandel District	Central	Carterton District	Southern	Waitaki District
Waikato	Waikato District	Central	South Wairarapa District	Auckland	Albert-Eden Local Board Area
Waikato	Waipa District	Central	Tararua District	Auckland	Devonport-Takapuna Local Board Area
Bay of Plenty	Kawerau District	Wellington	Lower Hutt City	Auckland	Franklin Local Board Area
Bay of Plenty	Opotiki District	Wellington	Porirua City	Auckland	Henderson-Massey Local Board Area
Bay of Plenty	Rotorua District	Wellington	Upper Hutt City	Auckland	Hibiscus and Bays Local Board Area
Bay of Plenty	South Waikato District	Wellington	Wellington City	Auckland	Howick Local Board Area
Bay of Plenty	Taupo District	Nelson	Buller District	Auckland	Kaipatiki Local Board Area
Bay of Plenty	Tauranga City	Nelson	Grey District	Auckland	Mangere-Otahuhu Local Board Area
Bay of Plenty	Western Bay of Plenty District	Nelson	Kaikoura District	Auckland	Manurewa Local Board Area
Bay of Plenty	Whakatane District	Nelson	Marlborough District	Auckland	Maungakiekie-Tamaki Local Board Area
East Coast	Central Hawke's Bay District	Nelson	Nelson City	Auckland	Orakei Local Board Area
East Coast	Gisborne District	Nelson	Tasman District	Auckland	Otara-Papatoetoe Local Board Area
East Coast	Hastings District	Nelson	Westland District	Auckland	Papakura Local Board Area
East Coast	Napier City	Canterbury	Ashburton District	Auckland	Puketapapa Local Board Area
East Coast	Wairoa District	Canterbury	Christchurch City	Auckland	Rodney Local Board Area
Taranaki	New Plymouth District	Canterbury	Hurunui District	Auckland	Upper Harbour Local Board Area
Taranaki	Otorohanga District	Canterbury	Selwyn District	Auckland	Waiheke Local Board Area
Taranaki	Ruapehu District	Canterbury	Waimakariri District	Auckland	Waitakere Ranges Local Board Area
Taranaki	South Taranaki District	Southern	Central Otago District	Auckland	Waitemata Local Board Area
Taranaki	Stratford District	Southern	Clutha District	Auckland	Whau Local Board Area
Taranaki	Waitomo District	Southern	Dunedin City		
Taranaki	Wanganui District	Southern	Gore District		



## APPENDIX C ECONOMIC ASSUMPTIONS

---

### C.1 Inflation assumptions

We model historical payments in June 2017 dollars. To do this, we inflate older payments to current levels using the historical Consumer Price Index (CPI) as shown in Table C.1.1 below (this is consistent with benefit rate increases). We also apply inflation to our projected payments in line with Treasury forecasts, presented in Table C.1.2.

For inflation factors that are different to CPI (namely average weekly earnings and market rents) we express these as the inflation *relative* to CPI in the projection.

We have assumed that incomes for working-age individuals in public housing grow at the rate of CPI, regardless of benefit status. This appears reasonable based on historical data. However, there is no inherent reason why the income of non-beneficiaries should be limited to CPI. In comparison, superannuation payments to those aged over 65 are currently indexed to changes in average weekly earnings (AWE). This means IRRS payment levels to pensioners will tend to grow more slowly than working-age clients. Tables C.1.1 and C.1.2 shows the historical and projected AWE increases relative to CPI.

We have assumed that growth in rents will be faster than AWE growth in the short to medium term. The historical and projected rental growth assumptions as a difference to CPI are presented in Tables C.1.1 and C.1.2. There are a number of reasons why rents can temporarily grow faster than average wages for example:

- » National average wages may mask regional effects such as higher wage growth in major cities.
- » Housing costs can grow as a proportion of total income.
- » Housing supply constraints can push both the home purchase and rental markets higher. These supply constraints can be further compounded by population growth, both from births and migration.



**Table C.1.1 Historic CPI, AWE and rental growth increases**

Date	CPI Yearly increase	CPI Scale up factor to 30 June 2017	AWE yearly increase relative to CPI	Rental growth yearly increase (National), relative to CPI
1-Apr-96	2.2%	1.52	0.7%	5.7%
1-Apr-97	1.8%	1.49	2.1%	2.9%
1-Apr-98	1.3%	1.47	0.2%	-0.4%
1-Apr-99	-0.2%	1.48	2.2%	-1.4%
1-Apr-00	1.5%	1.45	-0.1%	-1.4%
1-Apr-01	3.2%	1.41	-0.8%	-2.5%
1-Apr-02	2.6%	1.37	3.1%	1.7%
1-Apr-03	2.6%	1.34	0.7%	4.4%
1-Apr-04	1.6%	1.32	2.0%	5.1%
1-Apr-05	2.8%	1.28	0.2%	1.0%
1-Apr-06	3.3%	1.24	1.1%	0.4%
1-Apr-07	2.4%	1.21	3.1%	3.5%
1-Apr-08	3.5%	1.17	1.2%	3.3%
1-Apr-09	2.9%	1.14	2.7%	-1.7%
1-Apr-10	1.9%	1.12	-1.2%	0.3%
1-Apr-11	4.5%	1.07	-0.4%	-0.7%
1-Apr-12	1.5%	1.05	2.2%	1.8%
1-Apr-13	0.9%	1.04	1.9%	2.3%
1-Apr-14	1.4%	1.03	1.9%	2.6%
1-Apr-15	0.3%	1.03	2.2%	4.4%
1-Apr-16	0.4%	1.02	1.7%	4.6%
1-Apr-17	2.2%	1.00	0.0%	3.0%

**Notes:**

- (a) Increases to CPI and AWE apply at the first of April each year, as done by Work and Income.
- (b) Increases to rent are applied quarterly.



**Table C.1.2 Projected CPI, AWE and rental growth**

Date	CPI Yearly increase	CPI Scale up factor	AWE yearly increase relative to CPI	Rental growth yearly increase (National), relative to CPI
01-Apr-17		1.00		
01-Apr-18	1.67%	1.02	-0.27%	0.69%
01-Apr-19	1.67%	1.03	1.21%	2.08%
01-Apr-20	1.67%	1.05	0.91%	1.67%
01-Apr-21	1.67%	1.07	0.61%	1.27%
01-Apr-22	1.67%	1.09	0.61%	1.17%
01-Apr-23	1.67%	1.10	0.79%	1.25%
01-Apr-24	1.67%	1.12	0.97%	1.33%
01-Apr-25	1.67%	1.14	1.15%	1.41%
01-Apr-26	1.67%	1.16	1.34%	1.49%
01-Apr-27	1.67%	1.18	1.50%	1.55%
01-Apr-28	1.67%	1.20	1.50%	1.50%
01-Apr-29	1.67%	1.22	1.50%	1.50%
01-Apr-30	1.67%	1.24	1.50%	1.50%
01-Apr-31	1.67%	1.26	1.50%	1.50%
01-Apr-32	1.67%	1.28	1.50%	1.50%
01-Apr-33	1.67%	1.30	1.50%	1.50%
01-Apr-34	1.67%	1.33	1.50%	1.50%
01-Apr-35	1.67%	1.35	1.50%	1.50%
01-Apr-36	1.67%	1.37	1.50%	1.50%
01-Apr-37	1.67%	1.39	1.50%	1.50%
01-Apr-38	1.70%	1.42	1.47%	1.47%
01-Apr-39	1.73%	1.44	1.47%	1.47%
01-Apr-40	1.76%	1.47	1.47%	1.47%
01-Apr-41	1.79%	1.49	1.47%	1.47%
01-Apr-42	1.83%	1.52	1.46%	1.46%
01-Apr-43	1.86%	1.55	1.47%	1.47%
01-Apr-44	1.89%	1.58	1.47%	1.47%
01-Apr-45	1.92%	1.61	1.47%	1.47%
01-Apr-46	1.96%	1.64	1.46%	1.46%
01-Apr-47	1.99%	1.67	1.47%	1.47%
01-Apr-48	2.00%	1.71	1.49%	1.49%
01-Apr-49	2.00%	1.74	1.50%	1.50%
01-Apr-50	2.00%	1.77	1.50%	1.50%
01-Apr-51	2.00%	1.81	1.50%	1.50%
01-Apr-52	2.00%	1.85	1.50%	1.50%
01-Apr-53	2.00%	1.88	1.50%	1.50%
01-Apr-54	2.00%	1.92	1.50%	1.50%
01-Apr-55	2.00%	1.96	1.50%	1.50%
01-Apr-56	2.00%	2.00	1.50%	1.50%
01-Apr-57	2.00%	2.04	1.50%	1.50%
01-Apr-58	2.00%	2.08	1.50%	1.50%
Later	2.00%		1.50%	1.50%

**Notes:**

- (a) CPI and AWE increases assumed to apply at 1 April, consistent with current practice.
- (b) Rent increases applied quarterly.
- (c) CPI assumptions based on Treasury projections of CPI as at Jun-17, in provided spreadsheet *disc-rates-jun17.xls*.



**Table C.1.3 Historical regional rental growth rates (3 bedrooms) by region**

Date	Yearly 3 bedroom rental growth rate					
	Northland	Auckland	Waikato	Bay of Plenty	East coast	Taranaki
30-Jun-95	4.6%	12.6%	8.7%	6.0%	5.9%	4.8%
30-Jun-96	4.1%	9.9%	5.2%	3.7%	4.6%	1.0%
30-Jun-97	8.2%	2.3%	6.9%	1.9%	8.4%	-0.2%
30-Jun-98	4.0%	-3.1%	-0.9%	2.7%	-1.1%	0.8%
30-Jun-99	-3.1%	-3.4%	-0.2%	-1.1%	-0.7%	-0.2%
30-Jun-00	0.2%	0.8%	-1.7%	1.0%	-0.5%	-1.6%
30-Jun-01	0.5%	0.2%	-0.2%	1.5%	0.4%	-0.7%
30-Jun-02	1.9%	7.1%	4.3%	2.9%	3.1%	5.1%
30-Jun-03	3.4%	7.3%	4.4%	1.3%	6.0%	7.8%
30-Jun-04	10.7%	4.8%	10.6%	12.4%	8.3%	7.1%
30-Jun-05	8.3%	2.1%	6.9%	6.5%	5.9%	9.4%
30-Jun-06	12.1%	1.4%	7.2%	7.8%	6.0%	8.9%
30-Jun-07	7.6%	5.6%	6.4%	6.9%	5.8%	7.4%
30-Jun-08	4.2%	5.4%	4.8%	4.7%	5.3%	8.7%
30-Jun-09	-0.6%	0.1%	0.5%	-0.2%	0.3%	2.4%
30-Jun-10	1.9%	3.8%	2.2%	4.7%	2.5%	1.8%
30-Jun-11	1.7%	5.4%	3.1%	2.0%	2.2%	2.0%
30-Jun-12	2.1%	4.1%	1.8%	1.1%	3.4%	3.3%
30-Jun-13	0.6%	3.6%	3.5%	1.3%	0.5%	2.2%
30-Jun-14	2.1%	5.2%	2.5%	2.2%	4.0%	1.1%
30-Jun-15	6.8%	5.3%	4.8%	1.4%	4.9%	3.6%
30-Jun-16	6.7%	5.4%	7.4%	4.8%	10.1%	2.0%
30-Jun-17	7.7%	4.3%	5.3%	7.8%	7.4%	5.2%

Date	Yearly 3 bedroom rental growth rate					
	Central	Wellington	Nelson	Canterbury	Southern	National
30-Jun-95	2.2%	7.0%	3.8%	7.5%	8.5%	9.1%
30-Jun-96	3.0%	6.0%	1.8%	3.9%	-2.6%	7.2%
30-Jun-97	2.9%	4.3%	2.1%	3.8%	-3.6%	3.9%
30-Jun-98	1.6%	7.4%	3.9%	-0.3%	-0.3%	0.0%
30-Jun-99	2.8%	2.5%	1.5%	-2.4%	4.4%	-1.1%
30-Jun-00	0.3%	0.6%	-1.4%	0.3%	0.9%	0.4%
30-Jun-01	2.2%	2.0%	4.6%	0.5%	6.1%	1.0%
30-Jun-02	2.3%	2.0%	6.5%	6.7%	7.7%	5.6%
30-Jun-03	4.4%	3.6%	12.0%	9.3%	9.3%	6.3%
30-Jun-04	4.0%	3.2%	6.0%	10.1%	13.6%	6.4%
30-Jun-05	3.0%	4.4%	4.8%	4.6%	4.2%	3.7%
30-Jun-06	8.5%	5.9%	3.9%	5.4%	2.9%	4.1%
30-Jun-07	6.7%	9.9%	7.9%	6.2%	4.7%	6.2%
30-Jun-08	8.0%	7.6%	5.4%	4.7%	9.0%	5.7%
30-Jun-09	1.6%	4.9%	1.7%	-1.2%	-1.2%	0.5%
30-Jun-10	2.8%	2.1%	3.4%	2.6%	3.7%	3.0%
30-Jun-11	3.6%	2.5%	2.1%	4.2%	4.0%	3.7%
30-Jun-12	1.9%	1.9%	2.2%	8.7%	1.6%	3.6%
30-Jun-13	0.0%	1.4%	2.7%	10.0%	3.5%	3.1%
30-Jun-14	4.2%	3.3%	1.2%	8.1%	5.6%	4.7%
30-Jun-15	3.4%	2.3%	2.1%	2.0%	5.8%	4.2%
30-Jun-16	5.5%	6.2%	2.9%	-3.3%	9.0%	5.4%
30-Jun-17	7.7%	5.0%	5.0%	-2.3%	4.9%	4.8%

Notes:

- (a) Historical rental increases based on MBIE data from <http://www.mbie.govt.nz/info-services/housing-property/sector-information-and-statistics/rental-bond-data>



**Table C.1.4 Projected regional rental growth rates by region**

Date	Quarterly rental growth rate					
	Northland	Auckland	Waikato	Bay of Plenty	East coast	Taranaki
30-Sep-17	4.31%	2.19%	3.51%	3.52%	5.73%	1.00%
31-Dec-17	4.07%	2.19%	3.36%	3.37%	5.33%	1.13%
31-Mar-18	3.84%	2.19%	3.22%	3.22%	4.94%	1.26%
30-Jun-18	3.57%	2.16%	3.04%	3.04%	4.51%	1.36%
30-Sep-18	4.83%	3.69%	4.40%	4.40%	5.59%	3.04%
31-Dec-18	4.55%	3.69%	4.22%	4.23%	5.11%	3.21%
31-Mar-19	4.26%	3.70%	4.05%	4.05%	4.64%	3.37%
30-Jun-19	3.98%	3.70%	3.88%	3.88%	4.17%	3.54%
30-Sep-19	3.40%	3.40%	3.40%	3.40%	3.40%	3.40%
31-Dec-19	3.37%	3.37%	3.37%	3.37%	3.37%	3.37%
31-Mar-20	3.34%	3.34%	3.34%	3.34%	3.34%	3.34%
30-Jun-20	3.32%	3.32%	3.32%	3.32%	3.32%	3.32%
30-Sep-20	2.99%	2.99%	2.99%	2.99%	2.99%	2.99%
31-Dec-20	2.96%	2.96%	2.96%	2.96%	2.96%	2.96%
31-Mar-21	2.94%	2.94%	2.94%	2.94%	2.94%	2.94%
30-Jun-21	2.91%	2.91%	2.91%	2.91%	2.91%	2.91%
30-Sep-21	2.89%	2.89%	2.89%	2.89%	2.89%	2.89%
31-Dec-21	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%
31-Mar-22	2.84%	2.84%	2.84%	2.84%	2.84%	2.84%
30-Jun-22	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%

Date	Quarterly rental growth rate					
	Central	Wellington	Nelson	Canterbury	Southern	National
30-Sep-17	3.78%	2.85%	1.34%	-4.84%	4.08%	2.41%
31-Dec-17	3.60%	2.77%	1.43%	-4.08%	3.86%	2.38%
31-Mar-18	3.43%	2.70%	1.52%	-3.31%	3.65%	2.36%
30-Jun-18	3.22%	2.59%	1.59%	-2.57%	3.41%	2.30%
30-Sep-18	4.54%	4.04%	3.23%	-0.15%	4.70%	3.80%
31-Dec-18	4.33%	3.96%	3.34%	0.80%	4.45%	3.78%
31-Mar-19	4.12%	3.87%	3.46%	1.76%	4.20%	3.75%
30-Jun-19	3.91%	3.79%	3.58%	2.73%	3.95%	3.73%
30-Sep-19	3.40%	3.40%	3.40%	3.40%	3.40%	3.40%
31-Dec-19	3.37%	3.37%	3.37%	3.37%	3.37%	3.37%
31-Mar-20	3.34%	3.34%	3.34%	3.34%	3.34%	3.34%
30-Jun-20	3.32%	3.32%	3.32%	3.32%	3.32%	3.32%
30-Sep-20	2.99%	2.99%	2.99%	2.99%	2.99%	2.99%
31-Dec-20	2.96%	2.96%	2.96%	2.96%	2.96%	2.96%
31-Mar-21	2.94%	2.94%	2.94%	2.94%	2.94%	2.94%
30-Jun-21	2.91%	2.91%	2.91%	2.91%	2.91%	2.91%
30-Sep-21	2.89%	2.89%	2.89%	2.89%	2.89%	2.89%
31-Dec-21	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%
31-Mar-22	2.84%	2.84%	2.84%	2.84%	2.84%	2.84%
30-Jun-22	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%



## C.2 Discounting

Future cash flows are discounted to present value using the risk-free rate. This is taken to be the New Zealand government bond rate, as published by Treasury.

**Table C.2.1 Discounting assumptions**

Quarter	Treasury forward rate (end of qtr)	Discount factor applied to cashflows (middle of qtr)
Jun-18	1.97%	98.3%
Jun-19	2.36%	96.1%
Jun-20	2.66%	93.6%
Jun-21	2.89%	91.0%
Jun-22	3.10%	88.3%
Jun-23	3.29%	85.5%
Jun-24	3.45%	82.7%
Jun-25	3.60%	79.8%
Jun-26	3.72%	77.0%
Jun-27	3.83%	74.1%
Jun-28	3.92%	71.3%
Jun-29	4.01%	68.6%
Jun-30	4.10%	65.9%
Jun-31	4.18%	63.3%
Jun-32	4.25%	60.7%
Jun-33	4.32%	58.2%
Jun-34	4.38%	55.7%
Jun-35	4.44%	53.4%
Jun-36	4.49%	51.1%
Jun-37	4.54%	48.9%
Jun-38	4.56%	46.7%
Jun-39	4.58%	44.7%
Jun-40	4.60%	42.7%
Jun-41	4.62%	40.8%
Jun-42	4.64%	39.0%
Jun-43	4.66%	37.3%
Jun-44	4.68%	35.6%
Jun-45	4.70%	34.0%
Jun-46	4.72%	32.5%
Jun-47	4.74%	31.0%
Jun-48	4.75%	29.6%
Later	4.75%	

**Notes:**

- (a) Discounting assumptions apply to the middle of each quarter.
- (b) Although the table only shows the discount factor for each June quarter, in practice, separate discount factors are calculated for each quarter.
- (c) Assumptions based on Treasury projections of monthly forward rates as at Jun-17, in spreadsheet titled *disc-rates-jun17.xls*. Forward rates are as provided by Treasury.



## C.3 Unemployment rate

The unemployment rate is built into the state transition models, and thus influences the projection result. We use the new definitions of unemployment adopted by Statistics New Zealand in June 2016. We apply rates at a regional level.

**Table C.3.1 Historic national unemployment rate**

Year	Unemployment rate			
	31-Mar	30-Jun	30-Sep	31-Dec
1992	11.0%	10.4%	10.6%	10.6%
1993	10.1%	10.2%	9.6%	9.4%
1994	9.3%	8.5%	8.0%	7.6%
1995	6.8%	6.4%	6.3%	6.4%
1996	6.4%	6.1%	6.5%	6.2%
1997	6.7%	6.8%	7.0%	7.0%
1998	7.4%	7.9%	7.7%	8.0%
1999	7.5%	7.3%	7.0%	6.4%
2000	6.4%	6.3%	6.0%	5.8%
2001	5.5%	5.4%	5.4%	5.6%
2002	5.3%	5.3%	5.6%	5.0%
2003	5.0%	4.8%	4.5%	4.7%
2004	4.3%	4.2%	3.9%	3.7%
2005	3.9%	3.9%	3.8%	3.8%
2006	4.1%	3.7%	3.9%	3.8%
2007	3.9%	3.6%	3.6%	3.3%
2008	3.7%	3.8%	4.0%	4.4%
2009	5.0%	5.7%	6.1%	6.5%
2010	5.9%	6.5%	6.0%	6.2%
2011	6.0%	6.0%	5.9%	6.0%
2012	6.3%	6.4%	6.7%	6.2%
2013	5.7%	6.0%	5.8%	5.6%
2014	5.6%	5.3%	5.2%	5.5%
2015	5.4%	5.5%	5.6%	4.9%
2016	5.2%	5.1%	4.9%	5.2%
2017	4.9%	4.8%		

Notes:

- (a) Rates supplied by Treasury, sourced from Infoshare.
- (b) Figures are seasonally adjusted.

**Table C.3.2 Projected national unemployment rate**

Year	Unemployment rate			
	31-Mar	30-Jun	30-Sep	31-Dec
2017			4.8%	4.7%
2018	4.7%	4.6%	4.6%	4.6%
2019	4.5%	4.4%	4.4%	4.4%
2020	4.3%	4.3%	4.3%	4.3%
2021	4.3%	4.3%	4.3%	4.3%
Later	4.3%	4.3%	4.3%	4.3%

Notes:

- (a) Annual unemployment forecasts based on those provided by Treasury in their PREFU 2017 economic forecasts to June 2021.



**Table C.3.3.1 Historical regional unemployment rates in Northland**

Unemployment rate in Northland				
Year	31-Mar	30-Jun	30-Sep	31-Dec
1992	16.3%	12.3%	12.7%	12.1%
1993	10.0%	15.9%	15.8%	14.3%
1994	12.7%	12.9%	14.8%	14.3%
1995	13.6%	10.0%	10.1%	11.7%
1996	12.0%	11.4%	9.1%	6.9%
1997	8.7%	10.4%	9.3%	10.1%
1998	12.7%	11.5%	11.5%	14.2%
1999	13.3%	14.1%	9.2%	9.7%
2000	9.7%	8.9%	9.2%	9.0%
2001	7.9%	6.9%	8.5%	9.6%
2002	11.1%	8.9%	8.8%	8.8%
2003	10.2%	7.6%	8.7%	7.2%
2004	4.4%	5.0%	5.4%	4.4%
2005	4.4%	7.4%	5.9%	5.0%
2006	5.7%	6.0%	5.7%	3.6%
2007	5.1%	3.5%	5.5%	2.7%
2008	4.7%	4.1%	7.1%	6.5%
2009	8.5%	7.7%	8.9%	9.0%
2010	8.8%	8.9%	7.8%	8.2%
2011	9.3%	7.2%	8.2%	7.8%
2012	8.1%	8.7%	8.9%	9.0%
2013	9.2%	6.8%	9.0%	8.2%
2014	7.5%	7.3%	8.3%	7.8%
2015	8.8%	7.4%	8.1%	6.0%
2016	8.4%	10.6%	7.6%	7.2%
2017	7.9%	7.2%		

**Table C.3.3.2 Historical regional unemployment rates in Auckland**

Unemployment rate in Auckland				
Year	31-Mar	30-Jun	30-Sep	31-Dec
1992	13.0%	12.0%	10.9%	10.9%
1993	10.8%	10.6%	9.9%	8.7%
1994	10.1%	8.0%	7.3%	6.7%
1995	5.9%	5.8%	5.4%	5.2%
1996	5.1%	5.3%	5.7%	5.1%
1997	6.4%	7.0%	7.3%	7.0%
1998	7.7%	7.8%	6.7%	6.7%
1999	7.0%	6.3%	6.3%	5.0%
2000	6.5%	5.9%	5.2%	5.1%
2001	5.4%	5.7%	4.3%	4.7%
2002	5.0%	5.2%	5.0%	4.1%
2003	4.6%	4.1%	3.4%	3.9%
2004	4.5%	3.9%	3.9%	3.4%
2005	4.2%	3.4%	3.5%	3.7%
2006	3.9%	3.2%	3.8%	3.8%
2007	4.6%	3.3%	3.6%	3.6%
2008	4.6%	4.1%	4.1%	5.0%
2009	6.3%	6.1%	6.2%	7.2%
2010	7.5%	8.1%	6.7%	6.9%
2011	7.0%	6.6%	6.2%	6.1%
2012	7.2%	6.8%	7.7%	6.4%
2013	6.7%	6.3%	5.9%	5.6%
2014	6.6%	5.8%	5.7%	5.6%
2015	6.5%	5.9%	5.6%	5.1%
2016	6.1%	4.7%	5.3%	5.1%
2017	5.0%	4.5%		

**Table C.3.3.3 Historical regional unemployment rates in Waikato**

Unemployment rate in Waikato				
Year	31-Mar	30-Jun	30-Sep	31-Dec
1992	12.1%	11.2%	11.0%	10.5%
1993	12.1%	12.1%	9.6%	9.7%
1994	9.8%	9.4%	7.7%	7.8%
1995	8.8%	6.8%	6.3%	6.6%
1996	8.2%	6.5%	7.5%	6.5%
1997	8.3%	7.5%	6.7%	7.4%
1998	8.3%	8.3%	8.4%	9.2%
1999	10.3%	8.7%	7.6%	6.4%
2000	7.9%	5.9%	6.2%	6.1%
2001	6.6%	6.0%	5.9%	6.3%
2002	6.3%	5.0%	5.6%	5.6%
2003	5.7%	5.2%	3.3%	4.4%
2004	4.0%	3.1%	2.9%	3.2%
2005	4.2%	4.9%	3.9%	4.2%
2006	4.4%	2.9%	3.7%	2.8%
2007	4.4%	3.7%	3.3%	3.3%
2008	4.1%	3.9%	4.3%	4.4%
2009	5.6%	6.5%	6.0%	5.7%
2010	5.2%	5.6%	6.5%	5.5%
2011	6.7%	5.7%	6.6%	6.0%
2012	8.0%	6.5%	5.8%	5.3%
2013	5.4%	5.4%	5.7%	6.3%
2014	6.2%	6.1%	5.6%	5.4%
2015	5.9%	4.6%	6.2%	4.8%
2016	5.4%	4.8%	4.5%	5.7%
2017	4.9%	4.4%		

**Table C.3.3.4 Historical regional unemployment rates in Bay of Plenty**

Unemployment rate in Bay of Plenty				
Year	31-Mar	30-Jun	30-Sep	31-Dec
1992	13.5%	12.8%	12.9%	12.6%
1993	13.5%	10.6%	9.6%	11.8%
1994	13.2%	10.7%	10.1%	9.7%
1995	10.1%	9.6%	7.0%	8.3%
1996	9.3%	6.6%	8.1%	9.2%
1997	10.6%	9.1%	8.3%	9.1%
1998	9.9%	12.2%	11.2%	11.7%
1999	11.9%	10.9%	9.2%	8.6%
2000	7.5%	8.9%	8.4%	6.7%
2001	9.0%	7.9%	8.6%	8.1%
2002	7.5%	8.3%	7.4%	6.9%
2003	7.9%	7.0%	5.3%	6.2%
2004	7.0%	5.3%	3.2%	4.5%
2005	4.7%	3.1%	4.3%	4.2%
2006	5.1%	3.9%	4.2%	3.6%
2007	4.0%	2.9%	3.4%	3.7%
2008	4.9%	3.8%	4.1%	4.3%
2009	5.9%	5.7%	7.5%	6.9%
2010	7.7%	7.7%	8.3%	6.8%
2011	7.0%	6.6%	7.3%	7.8%
2012	8.1%	5.8%	6.8%	8.2%
2013	7.7%	5.8%	6.8%	8.8%
2014	6.7%	5.4%	6.3%	5.4%
2015	7.5%	6.3%	5.8%	5.9%
2016	4.7%	5.1%	5.1%	4.9%
2017	7.6%	6.1%		

**Table C.3.3.5 Historical regional unemployment rates in East Coast**

Unemployment rate in East Coast				
Year	31-Mar	30-Jun	30-Sep	31-Dec
1992	11.4%	10.0%	11.3%	13.6%
1993	9.9%	11.8%	10.3%	12.8%
1994	12.7%	8.8%	8.9%	9.4%
1995	9.2%	7.1%	7.7%	6.3%
1996	7.0%	7.4%	9.1%	7.9%
1997	8.9%	8.1%	10.2%	8.2%
1998	9.3%	9.2%	10.7%	8.1%
1999	7.0%	7.4%	7.5%	9.3%
2000	7.3%	6.3%	7.7%	8.0%
2001	7.0%	6.5%	6.0%	7.3%
2002	4.9%	5.0%	5.2%	6.0%
2003	6.3%	4.3%	5.3%	5.7%
2004	6.1%	4.4%	5.5%	4.9%
2005	4.7%	4.8%	7.0%	4.9%
2006	3.9%	3.8%	4.9%	4.8%
2007	4.8%	5.0%	4.2%	4.7%
2008	5.8%	4.4%	6.6%	6.3%
2009	6.8%	7.2%	9.7%	8.2%
2010	6.5%	8.2%	7.0%	6.9%
2011	7.8%	6.8%	7.0%	6.7%
2012	7.8%	6.0%	8.7%	8.4%
2013	8.0%	7.3%	8.1%	7.1%
2014	7.9%	6.5%	6.7%	7.8%
2015	7.2%	7.7%	6.9%	6.6%
2016	7.9%	5.0%	6.5%	8.1%
2017	7.6%	5.8%		

**Table C.3.3.6 Historical regional unemployment rates in Taranaki**

Unemployment rate in Taranaki				
Year	31 Mar	30 Jun	30-Sep	31-Dec
1992	13.6%	10.1%	10.3%	12.2%
1993	13.4%	8.6%	11.2%	10.0%
1994	10.0%	8.2%	8.1%	7.8%
1995	7.8%	6.3%	8.2%	6.5%
1996	7.6%	6.4%	8.1%	7.4%
1997	8.3%	7.0%	8.0%	6.5%
1998	6.6%	8.1%	6.9%	7.3%
1999	6.9%	6.2%	6.8%	8.9%
2000	10.2%	8.2%	6.3%	5.3%
2001	6.2%	4.8%	5.9%	6.1%
2002	5.1%	4.6%	5.8%	5.7%
2003	5.1%	5.6%	5.1%	4.5%
2004	5.3%	3.8%	4.3%	4.3%
2005	3.8%	2.9%	3.4%	4.2%
2006	5.1%	2.3%	3.6%	2.7%
2007	4.1%	4.0%	2.6%	2.6%
2008	3.5%	2.9%	3.3%	3.0%
2009	2.7%	4.3%	3.7%	5.9%
2010	4.8%	4.5%	4.8%	4.8%
2011	4.6%	5.1%	5.0%	3.5%
2012	4.5%	3.5%	4.4%	5.0%
2013	5.1%	5.0%	5.1%	5.6%
2014	6.3%	5.0%	4.4%	4.8%
2015	6.0%	7.2%	4.6%	3.9%
2016	5.7%	4.9%	4.7%	6.8%
2017	6.2%	5.0%		

**Table C.3.3.7 Historical regional unemployment rates in Central**

Unemployment rate in Central				
Year	31-Mar	30-Jun	30-Sep	31-Dec
1992	12.4%	10.4%	12.0%	13.0%
1993	12.1%	11.3%	9.3%	9.6%
1994	9.5%	8.9%	9.2%	8.7%
1995	6.0%	6.2%	8.2%	8.0%
1996	7.5%	6.3%	6.3%	6.1%
1997	6.0%	5.9%	5.5%	5.7%
1998	8.0%	6.8%	8.3%	5.6%
1999	7.5%	5.7%	7.3%	7.9%
2000	6.8%	6.8%	6.8%	5.5%
2001	6.7%	4.6%	4.3%	5.4%
2002	6.2%	5.4%	5.3%	4.0%
2003	4.8%	5.3%	5.4%	3.8%
2004	5.9%	4.3%	3.0%	4.3%
2005	4.8%	4.2%	4.5%	4.2%
2006	5.4%	4.8%	4.0%	4.4%
2007	5.0%	5.2%	5.1%	5.3%
2008	5.0%	4.4%	3.6%	3.7%
2009	4.7%	4.6%	5.4%	7.8%
2010	6.9%	6.8%	6.2%	6.5%
2011	6.5%	6.7%	6.1%	6.1%
2012	8.7%	6.9%	7.7%	8.0%
2013	7.0%	8.3%	7.1%	5.1%
2014	7.4%	6.6%	6.5%	8.8%
2015	7.2%	6.5%	6.3%	6.1%
2016	6.9%	5.6%	4.6%	5.9%
2017	5.3%	4.7%		

**Table C.3.3.8 Historical regional unemployment rates in Wellington**

Unemployment rate in Wellington				
Year	31-Mar	30-Jun	30-Sep	31-Dec
1992	10.1%	8.0%	9.6%	10.0%
1993	10.0%	8.9%	9.2%	9.5%
1994	9.3%	9.3%	8.0%	7.7%
1995	7.6%	6.4%	6.5%	6.9%
1996	7.6%	6.4%	5.4%	6.0%
1997	6.6%	5.3%	5.0%	5.8%
1998	5.8%	5.4%	5.7%	7.1%
1999	6.7%	6.7%	5.1%	4.2%
2000	6.4%	5.4%	5.1%	4.8%
2001	4.5%	3.3%	4.7%	4.8%
2002	5.9%	4.6%	4.8%	5.0%
2003	6.2%	4.9%	4.8%	5.6%
2004	4.8%	4.8%	4.0%	4.0%
2005	4.7%	4.2%	3.2%	3.1%
2006	5.8%	5.9%	3.7%	4.4%
2007	4.7%	3.4%	3.3%	2.4%
2008	5.0%	3.1%	3.4%	3.5%
2009	4.7%	5.3%	5.6%	6.0%
2010	5.1%	4.8%	4.5%	4.8%
2011	6.4%	4.8%	5.0%	6.5%
2012	5.6%	5.9%	6.4%	7.1%
2013	6.2%	5.8%	5.4%	6.0%
2014	5.1%	5.0%	5.1%	5.5%
2015	5.7%	5.1%	6.2%	5.3%
2016	5.9%	5.3%	4.6%	5.6%
2017	5.1%	4.8%		

**Table C.3.3.9 Historical regional unemployment rates in Nelson**

Unemployment rate in Nelson				
Year	31-Mar	30-Jun	30-Sep	31-Dec
1992	9.4%	6.1%	7.3%	9.1%
1993	8.3%	9.4%	7.9%	9.4%
1994	9.9%	6.8%	6.0%	6.5%
1995	7.7%	4.2%	5.5%	4.2%
1996	4.9%	5.9%	6.1%	7.2%
1997	5.2%	5.9%	4.8%	4.8%
1998	5.5%	7.3%	5.9%	5.3%
1999	6.2%	5.7%	6.8%	6.3%
2000	4.9%	5.4%	4.6%	4.7%
2001	3.0%	2.5%	4.6%	4.1%
2002	3.5%	4.0%	2.3%	4.2%
2003	3.5%	3.0%	3.8%	3.6%
2004	2.8%	3.3%	1.9%	2.2%
2005	2.8%	2.4%	2.6%	3.3%
2006	4.2%	2.1%	3.1%	3.2%
2007	2.3%	3.4%	2.5%	2.6%
2008	3.3%	2.9%	3.2%	3.3%
2009	2.9%	3.2%	4.0%	4.4%
2010	4.7%	3.2%	3.7%	4.4%
2011	5.0%	4.0%	3.7%	4.6%
2012	5.5%	4.3%	4.3%	5.7%
2013	4.6%	4.0%	3.8%	4.1%
2014	4.9%	3.9%	3.2%	6.1%
2015	4.3%	4.4%	5.0%	4.0%
2016	5.0%	5.8%	2.7%	4.1%
2017	2.7%	3.0%		

**Table C.3.3.10 Historical regional unemployment rates in Canterbury**

Unemployment rate in Canterbury				
Year	31-Mar	30-Jun	30-Sep	31-Dec
1992	8.8%	9.3%	8.9%	8.5%
1993	9.7%	7.4%	6.6%	8.0%
1994	8.2%	7.2%	5.9%	6.5%
1995	6.0%	5.9%	5.2%	6.0%
1996	6.8%	6.0%	5.5%	6.3%
1997	7.2%	6.1%	6.8%	6.2%
1998	8.0%	7.6%	7.1%	8.5%
1999	7.8%	7.2%	7.0%	6.7%
2000	5.8%	6.2%	5.5%	5.4%
2001	6.0%	5.8%	5.2%	5.0%
2002	5.5%	4.7%	5.6%	4.2%
2003	4.4%	4.3%	4.4%	3.7%
2004	4.4%	4.0%	3.6%	3.1%
2005	4.0%	2.6%	3.0%	2.4%
2006	3.8%	2.7%	2.9%	2.9%
2007	3.3%	3.1%	2.6%	2.4%
2008	2.6%	3.1%	3.0%	3.3%
2009	4.5%	4.7%	5.2%	4.9%
2010	5.3%	4.5%	4.7%	5.4%
2011	4.9%	5.3%	4.9%	4.4%
2012	4.8%	6.0%	4.8%	4.4%
2013	4.0%	4.0%	3.9%	3.1%
2014	3.2%	2.7%	3.1%	3.4%
2015	2.8%	3.0%	3.5%	3.3%
2016	2.7%	3.2%	3.9%	3.7%
2017	4.0%	3.8%		

**Table C.3.3.11 Historical regional unemployment rates in Southern region**

Unemployment rate in Southern				
Year	31-Mar	30-Jun	30-Sep	31-Dec
1992	7.8%	8.6%	8.6%	7.5%
1993	7.2%	7.1%	7.9%	7.1%
1994	5.6%	6.5%	6.5%	6.0%
1995	4.9%	5.1%	3.8%	6.3%
1996	4.9%	5.5%	4.9%	4.7%
1997	4.8%	5.1%	5.4%	6.2%
1998	6.7%	6.6%	7.6%	7.3%
1999	7.1%	6.7%	6.5%	6.1%
2000	6.6%	5.8%	5.1%	5.7%
2001	4.5%	5.1%	5.4%	4.3%
2002	5.5%	4.7%	5.6%	4.8%
2003	5.1%	4.9%	4.9%	5.1%
2004	3.9%	3.9%	4.2%	3.4%
2005	4.2%	3.5%	2.5%	3.1%
2006	4.7%	2.9%	3.2%	3.2%
2007	3.2%	3.3%	2.9%	2.7%
2008	2.3%	3.6%	2.8%	2.8%
2009	3.5%	4.5%	4.7%	3.9%
2010	5.0%	4.3%	3.7%	4.6%
2011	4.0%	4.3%	4.2%	4.5%
2012	4.5%	4.1%	4.8%	4.1%
2013	3.9%	5.3%	4.8%	4.5%
2014	4.4%	3.1%	3.3%	3.6%
2015	3.5%	4.2%	4.3%	4.1%
2016	4.5%	4.7%	4.2%	4.3%
2017	4.5%	4.9%		

Notes:

- (a) Regional unemployment rates sourced from Statistics New Zealand.
- (b) Figures are not seasonally adjusted.
- (c) Southern region rates are the population weighted average of two Statistics New Zealand regions; Southland and Otago.

## C.4 Methodology for projecting regional unemployment rates

### C.4.1 Regional unemployment rate approach – historical series

Our projection models use a seasonally adjusted unemployment rate for New Zealand and its regions. Regional rates are only available in raw form, i.e. not seasonally adjusted. Therefore, for consistency in our modelling process, it is necessary to first produce seasonally-adjusted series of regional unemployment rates. We also remove some of the quarterly volatility via smoothing.

Our approach to producing adjusted regional unemployment rate series is as follows:

- » Source raw data from Statistics New Zealand
- » Calculate de-seasonalisation factors, taken as the average amount that quarter of year is above or below the average for a five year moving window centred at that date. For example the 1991Q2 de-seasonalisation factor is the average unemployment rate for Q2 in '89, '90, '91, '92, and '93 compared to the overall average in those five years
- » Centre the de-seasonalisation factors so that each rolling year of factors is centred at 100%
- » Use these centred de-seasonalisation factors to produce seasonally adjusted time series
- » Smooth the time series by using neighbouring quarters:

$$UE(t) = 0.25 UE(t - 1) + 0.5 UE(t) + 0.25 UE(t + 1)$$

### C.4.2 Regional unemployment rate approach – projection series

The following approach is used to derive regional forecasts:

- » Find regional weights using the average total labour force over 2016/17.
- » Assume the quarters from 2005Q3 through to 2008Q2 represent a period of 'full employment', and calculate the average unemployment in each region over this time period.
- » Calculate the difference between the regional average and national average over that period. These differentials are used in the regional long term rate assumption.
  - Currently Treasury uses 4.3% as the national long term unemployment rate. So for example a differential of +1.1% was calculated for Northland (over 2005-2008), so the Northland long term rate is 5.4%.
- » Mirror the Treasury projection shape for each region, taking the unemployment rate from the current level to the long term average rate over 5 years.
  - Manual adjustment was made to the Canterbury projection; Canterbury's rate was judged to be lower than full employment, and a slow increase to 3.3% was assumed.
- » Add a correction factor to each future quarter, to ensure that the weighted average unemployment rate equals that used at the national level.

The forecast regional unemployment rates are shown below.

**Table C.4.1 Projected regional unemployment rates**

Date	Unemployment rate					
	Northland	Auckland	Waikato	Plenty	East coast	Taranaki
30-Sep-17	7.1%	4.6%	4.5%	6.6%	6.5%	5.1%
31-Dec-17	7.0%	4.6%	4.5%	6.4%	6.4%	5.0%
31-Mar-18	6.8%	4.5%	4.5%	6.2%	6.3%	4.9%
30-Jun-18	6.7%	4.5%	4.5%	6.1%	6.2%	4.8%
30-Sep-18	6.5%	4.5%	4.5%	5.9%	6.1%	4.7%
31-Dec-18	6.3%	4.5%	4.4%	5.7%	6.0%	4.6%
31-Mar-19	6.0%	4.5%	4.4%	5.2%	5.8%	4.4%
30-Jun-19	5.8%	4.4%	4.4%	5.0%	5.7%	4.3%
30-Sep-19	5.7%	4.4%	4.3%	4.9%	5.6%	4.2%
31-Dec-19	5.7%	4.4%	4.3%	4.9%	5.6%	4.2%
31-Mar-20	5.6%	4.4%	4.3%	4.7%	5.5%	4.1%
30-Jun-20	5.6%	4.4%	4.3%	4.7%	5.5%	4.1%
30-Sep-20	5.6%	4.4%	4.3%	4.7%	5.5%	4.1%
31-Dec-20	5.6%	4.4%	4.3%	4.7%	5.5%	4.1%
31-Mar-21	5.6%	4.4%	4.3%	4.7%	5.5%	4.1%
30-Jun-21	5.4%	4.4%	4.3%	4.5%	5.4%	4.0%
30-Sep-21	5.4%	4.4%	4.3%	4.5%	5.4%	4.0%
31-Dec-21	5.4%	4.4%	4.3%	4.5%	5.4%	4.0%
31-Mar-22	5.4%	4.4%	4.3%	4.5%	5.4%	4.0%
Later	5.4%	4.4%	4.3%	4.5%	5.4%	4.0%

Date	Unemployment rate					
	Central	Wellington	Nelson	Canterbury	Southern	Total
30-Sep-17	4.9%	5.0%	2.9%	3.8%	4.6%	4.8%
31-Dec-17	4.9%	4.9%	3.0%	3.7%	4.5%	4.7%
31-Mar-18	5.0%	4.9%	3.0%	3.7%	4.4%	4.7%
30-Jun-18	5.0%	4.9%	3.1%	3.6%	4.3%	4.6%
30-Sep-18	5.1%	4.8%	3.1%	3.6%	4.3%	4.6%
31-Dec-18	5.1%	4.8%	3.2%	3.6%	4.2%	4.6%
31-Mar-19	5.2%	4.7%	3.3%	3.5%	4.0%	4.5%
30-Jun-19	5.2%	4.7%	3.4%	3.4%	3.9%	4.4%
30-Sep-19	5.2%	4.7%	3.4%	3.4%	3.8%	4.4%
31-Dec-19	5.2%	4.7%	3.4%	3.4%	3.9%	4.4%
31-Mar-20	5.3%	4.6%	3.5%	3.3%	3.8%	4.3%
30-Jun-20	5.3%	4.6%	3.4%	3.3%	3.8%	4.4%
30-Sep-20	5.3%	4.6%	3.4%	3.3%	3.8%	4.4%
31-Dec-20	5.3%	4.6%	3.4%	3.3%	3.8%	4.4%
31-Mar-21	5.3%	4.6%	3.4%	3.3%	3.8%	4.4%
30-Jun-21	5.3%	4.6%	3.5%	3.3%	3.7%	4.3%
30-Sep-21	5.3%	4.6%	3.5%	3.3%	3.7%	4.3%
31-Dec-21	5.3%	4.6%	3.5%	3.3%	3.7%	4.3%
31-Mar-22	5.3%	4.6%	3.5%	3.3%	3.7%	4.3%
Later	5.3%	4.6%	3.5%	3.3%	3.7%	4.3%

Notes:

(a) The "Total" column in the table above represents the national unemployment rate, consistent with Appendix C.3.2.



## C.5 Expense rates

As discussed in Section 7 we have made an allowance for expenses incurred by MSD in operating the public housing system and programs. We have assumed the total expense costs are fixed in real terms and are based on the 2017/18 budgeted appropriations of \$46.3m. Expense costs are allocated to current clients based on projected IRRS payments for these clients as a proportion of total IRRS payments. These proportions are shown in C.5.1.

**Table C.5.1 Proportion of expenses attributed to current clients**

Year	Projection quarter ending				Year	Projection quarter ending			
	31-Mar	30-Jun	30-Sep	31-Dec		31-Mar	30-Jun	30-Sep	31-Dec
2018	100%	99%	98%	96%	2058	14%	14%	14%	14%
2019	95%	93%	91%	90%	2059	13%	13%	13%	13%
2020	88%	86%	85%	84%	2060	13%	13%	12%	12%
2021	83%	82%	80%	79%	2061	12%	12%	12%	11%
2022	79%	78%	77%	76%	2062	11%	11%	11%	11%
2023	75%	74%	73%	72%	2063	11%	10%	10%	10%
2024	72%	70%	70%	69%	2064	10%	10%	10%	9%
2025	68%	68%	67%	66%	2065	9%	9%	9%	9%
2026	66%	64%	64%	63%	2066	8%	8%	8%	8%
2027	62%	62%	61%	60%	2067	8%	8%	8%	7%
2028	60%	59%	59%	58%	2068	7%	7%	7%	7%
2029	57%	57%	56%	55%	2069	7%	7%	7%	6%
2030	55%	54%	54%	53%	2070	6%	6%	6%	6%
2031	52%	52%	51%	51%	2071	6%	6%	6%	6%
2032	50%	49%	49%	49%	2072	5%	5%	5%	5%
2033	48%	47%	47%	47%	2073	5%	5%	5%	5%
2034	46%	46%	45%	45%	2074	5%	5%	4%	4%
2035	44%	44%	43%	43%	2075	4%	4%	4%	4%
2036	42%	42%	42%	41%	2076	4%	4%	4%	4%
2037	40%	40%	39%	39%	2077	4%	4%	4%	3%
2038	39%	38%	38%	37%	2078	3%	3%	3%	3%
2039	37%	36%	36%	36%	2079	3%	3%	3%	3%
2040	35%	35%	34%	34%	2080	3%	3%	3%	3%
2041	34%	33%	33%	32%	2081	3%	3%	3%	3%
2042	32%	32%	31%	31%	2082	2%	2%	2%	2%
2043	31%	30%	30%	30%	2083	2%	2%	2%	2%
2044	29%	29%	29%	28%	2084	2%	2%	2%	2%
2045	28%	28%	28%	27%	2085	2%	2%	2%	2%
2046	27%	26%	26%	26%	2086	2%	2%	2%	2%
2047	25%	25%	25%	25%	2087	2%	1%	1%	1%
2048	24%	24%	24%	23%	2088	1%	1%	1%	1%
2049	23%	23%	22%	22%	2089	1%	1%	1%	1%
2050	22%	22%	21%	21%	2090	1%	1%	1%	1%
2051	21%	21%	20%	20%	2091	1%	1%	1%	1%
2052	20%	19%	19%	19%	2092	1%	1%	1%	1%
2053	19%	18%	18%	18%	2093	1%	1%	1%	1%
2054	18%	18%	17%	17%	2094	1%	1%	1%	1%
2055	17%	17%	16%	16%	2095	1%	1%	1%	1%
2056	16%	16%	16%	15%	2096	0%	0%	0%	0%
2057	15%	15%	15%	15%					



## APPENDIX D DATA SUPPLIED

---

This year we received two versions of each dataset:

- » One up to 31 March 2017 but extracted as at 30 April 2017
- » A later version including information up to 30 June 2017 but extracted as at 31 July 2017.

The earlier extracts were used for modelling and the more recent extracts were used to create the projection cohort as at June 2017.

### D.1 Public Housing datasets

Responsibility for all public housing data moved from Housing New Zealand to MSD in August 2015. Data was provided by MSD to cover the period since the transition. These newly supplied datasets are described below. This was combined together with data used in 30 June 2015 projection which covers the period prior to the transition.

- » **Tenancy\_snapshot.sas7bdat:** File with one record per public housing tenancy per end-of-month snapshot date that contains:
  - Snapshot date
  - Anonymised identification number of the application
  - Anonymised identification number of the primary householder
  - Public house entry date
  - Household size
  - Household type
  - Household weekly income
  - Income related rent
  - Income related rent subsidy
  - Market rent
  - Number of bedrooms
  - Location details including meshblock ID
  - Public housing provider type
- » **Tenancy\_hh\_snapshot.sas7bdat:** File with one record per household member in a public housing tenancy per end-of-month snapshot date that contains:
  - Snapshot date
  - Anonymised identification number of the application
  - Anonymised identification number of the household member
  - Relationship to the primary householder
  - Date of birth
  - Gender
  - Ethnicity
  - Application signatory flag
- » **Evidence\_items.sas7bdat:** File with one record per household member in a public housing tenancy in addition to those in tenancy\_hh\_snapshot.sas7bdat that contains:
  - Anonymised identification number of the application
  - Anonymised identification number of the household member
  - Source of evidence indicating they are a member of the household
  - Evidence start and end dates
  - Gender
  - Year and month of birth
- » **Register\_snapshot.sas7bdat:** File with one record per application on the public housing register per end-of-month snapshot date that contains:
  - Snapshot date



- Anonymised identification number of the application
  - Anonymised identification number of the primary applicant
  - Analysis scores for affordability, adequacy, suitability, sustainability, accessibility and total
  - Main reason for application
  - Household size
  - Number of required bedrooms
  - Current location
  - Stated location preference
  - No particular location preference flag
  - Household type
  - Application status
  - Transfer register status
  - Start and end dates
- » **Register\_hh\_snapshot.sas7bdat:** File with one record per household member on the public housing register per end-of-month snapshot date that contains:
- Snapshot date
  - Anonymised identification number of the application
  - Anonymised identification number of the household member
  - Relationship to the primary applicant
  - Date of birth
  - Gender
  - Ethnicity
  - Application signatory flag
- » **Houses\_snapshot.sas7bdat:** File with one record per public house per end-of-month snapshot date that contains:
- Snapshot date
  - Legacy and new system identification numbers for the public house
  - Location details including meshblock ID, suburb and postcode
  - Number of bedrooms
  - Weekly market rent
  - Rent date
  - House characteristics including building year, bathroom status, kitchen status, carpeting, heating, parking and access description
  - Occupancy status and status and expiry date of the current lease
  - Anonymised identification number of the application for occupied houses
- » **Mig\_map\_tenancy.sas7bdat:** File with a mapping of pre data migration to post data migration anonymised application identification numbers for public housing tenancies that contains:
- Legacy anonymised identification number of the application
  - Current anonymised identification number of the application
  - Variables flagging potential duplication
- » **Mig\_map\_tenancy\_hh.sas7bdat:** File with a mapping of pre data migration to post data migration anonymised household member identification numbers for public housing tenancies that contains:
- Legacy anonymised identification number of the household member
  - Current anonymised identification number of the household member
  - Match type
- » **Mig\_map\_register.sas7bdat:** File with a mapping of pre data migration to post data migration anonymised application identification numbers for the public housing register that contains:
- Legacy anonymised identification number of the application
  - Current anonymised identification number of the application
  - Match type
- » **Mig\_map\_register\_hh.sas7bdat:** File with a mapping of pre data migration to post data migration anonymised household member identification numbers for the public housing register that contains:
- Legacy anonymised identification number of the household member
  - Current anonymised identification number of the household member



- Match type

## D.2 Benefit system datasets

SAS datasets relating to benefit receipt supplied by MSD were used to conduct the projection. The datasets were:

- » **rate\_period.sas7bdatt:** Rate file with one record per client and benefit spell that contains:
  - Client identification number
  - Benefit type code (plus codes for supplementary benefits)
  - Gross and net payment amounts for primary benefit
  - Payment amounts for any supplementary benefits
  - Spell start and end date

The dataset covered spells from March 1993 through to 30 June 2017, the projection date.
- » **ahpy\_lumpsum1.sas7bdatt:** Lump sum file which covers those payment types recorded on system in a lump sum fashion (single date, rather than spell start and end dates). Fields include:
  - Client identification number
  - Benefit type code
  - Gross and net payment amounts
  - Input date
- » **ahpy\_ccs.sas7bdatt:** Similar to the ahpy\_lumpsum1 file, except specific to the child care subsidy benefit, which was not included on the original lump sum file.
- » **rate\_cda.sas7bdatt:** Similar to the rate\_period file, but specific to the child disability allowance benefit, which was not included on the original rate\_period file.
- » **spel.sas7bdatt:** File with one row per spell per client, containing a variety of fields related to the spell. The “oldcomdt” field contained the first payment date for the spell, which was used to overwrite spell commencement dates before the 1993 system change.
- » **swn.sas7bdatt:** File with one row per client, with a range of static variables. This dataset was used to determine age, gender, education level and ethnicity for each client.
- » **swns\_with\_dob\_eth.sas7bdatt:** File with one row per client, containing client ID and age for all clients. This data set was used to fill in this information for those clients where it was not included in swn20170630.sas7bdatt.
- » **chd.sas7bdatt:** File containing one record for every ‘child spell’ per client. This effectively provides child records to attach to all benefit spells which depend on the age and number of children. Child age is also included.
- » **dist.sas7bdatt:** File containing one record for every district per spell per client. This allows the assignment of each client spell to their district and region.
- » **dist\_changes.sas7bdatt:** File containing further records on districts by client and spell. Used to fill in information for client spells where it was not included in dist\_20170630.sas7bdatt.
- » **yp\_ypp\_regions.sas7bdatt:** File similar in structure to the rate file, but only for clients in the youth payment or young parent payment. An additional field indicates which of the two payments the client actually received.
- » **ptnr.sas7bdatt:** File containing one record for every ‘partner spell’ per client. This allows the assignment of each client’s partner details on the historical data. The partner’s identification number is also included.



- » **incp.sas7bdat:** File containing one record for every ‘incapacity spell’ per client. This allows the assignment of each incapacity details such as type and number of incapacities to JS-HCD and SLP-HCD clients.
- » **slp\_sinc.sas7bdat:** File contained the required HCD reassessment frequency for SLP-HCD clients approximately each quarter end to 30 June 2017.
- » **dv\_debt\_summary.sas7bdat:** File containing information about client loans in the form of recoverable assistance. There is an entry for every client who had a debt balance at 1 July 2007, plus one entry per client per change to their debt status (e.g. repayment made or debt issued) from 1 July 2007 to 30 June 2017. Pre-1 July 2007 data is not split by breach type.
- » **prov.sas7bdat:** File giving the outstanding provision for debts owed to MSD as at 30 June 2017. It contains one row per client, their aggregated debt plus a range of other static variables.
- » **Abt\_final\_appt\_status.sas7bdat:** File containing one row per client appointment with MSD, a broad reason for the appointment and attendance information.
- » **All\_sanctions.sas7bdat:** File containing one row per client sanction indicating the type of sanction, the date and some categorical indicators. This was used to produce the new variable: number of suspensions in the past five years.

### D.3 Other datasets

As with previous years we were also provided with datasets covering information from CYF and Corrections, as well as a file linking anonymous identities across the different systems. The datasets were:

- » **cyf\_summary.sas7bdat:** File containing one record per client per child protection (CP) or youth justice (YJ) spell. This allowed the calculation of CP and YJ related variables for each client including the age of first entry into the CP and YJ and total number of CP and YJ events.
- » **mmc\_period.sas7bdat:** File containing one record per client per corrections sentence served. This allowed the calculation of criminal history related variables for each client including the percentage of time spent in prison over the last year and the percentage of time serving sentences over the last ten years excluding those for driving offences.
- » **Dmatch\_id.sas7bdat:** File linking anonymous identities from different sources including children registered to parents while on benefits, corrections identities, CP/YJ identities and public housing identities. The matches in this file were used to attach CP/YJ, criminal history, intergenerational and public housing related variables to benefit system clients.

### D.4 New Ministry of Education datasets

This year we were provided with multiple datasets containing Ministry of Education information of secondary schooling covering clients who have left a NZ school since 2008. The datasets provided were:

- » **Edu\_schoolsattended.sas7bdat:** File containing one row per enrolment at secondary school, includes anonymised school identifier and first and last day of attendance.
- » **Edu\_qualifications.sas7bdat:** File containing one row per qualification reported and provides the NQF qualification level. Qualifications include literacy, numeracy, NCEA qualifications and University Entrance. This was used to create the new educational attainment at school variable.
- » **Edu\_standdownsuspension.sas7bdat:** File containing one row per stand-down or suspension. Stand-downs are when students are not allowed at school for a number of days due to behavioural or other reasons, and Suspensions are for more serious incidents which may lead to longer periods away from



school or exclusion. Contains the start and end dates, a reason group, student age and year level. This was used to create the new total duration of suspensions and stand-downs at school variable.

- » **Edu\_unjustifiedabsence.sas7bdat:** File containing one row per each non-enrolment or unjustified absence. A non-enrolment record is opened if a student stops attending one school and does not enrol at another. An Unjustified Absence record is opened if students do not attend the school they are enrolled at. Contains the start, end and outcome dates as well as an outcome category.
- » **Edu\_gateway.sas7bdat:** File containing one row per person undertaking a Gateway programme. Gateway is a long-standing programme to help students transition from secondary school to either tertiary education or employment. Information included the start and end dates, the outcome category, region and credits achieved. Data was only current to December 2015.
- » **Edu\_tradeacademies.sas7bdat:** File containing one row per person undertaking a secondary tertiary programme or trade academies programme. Trades academies (Secondary-Tertiary Programmes) aim to engage young people in education and equip them with the vocational skills and training they need to gain future employment<sup>2</sup>. Information included the start and end dates, the outcome destination category and credits achieved. Data was only current to July 2016.
- » **Edu\_tradeacademies.sas7bdat:** File containing one row per person undertaking a secondary tertiary programme or trade academies programme. Trades academies (Secondary-Tertiary Programmes) aim to engage young people in education and equip them with the vocational skills and training they need to gain future employment<sup>3</sup>. Information included the start and end dates, the outcome destination category and credits achieved. Data was only current to July 2016.
- » **Edu\_tertiaryattendance.sas7bdat:** File containing one row per tertiary enrolment either during the schooling period or after. Includes information on the enrolment year, NQF level of the course and anonymised tertiary provider. This was used to create the new variable: Highest NQF level of tertiary enrolments to date.
- » **Edu\_school.sas7bdat:** File containing one record per school attended by any matched student. Includes information on the type of school, the current decile and TLA.
- » **Edu\_schooldecilehistory.sas7bdat:** File containing a time-series of the decile of each school in Edu\_school\_20170630.sas7bdat. Includes the start date and end date of the period for which the decile applied.
- » **Edu\_schooltypehistory.sas7bdat:** File containing a time-series of the institution type of each school in Edu\_school\_20170630.sas7bdat. Includes the start date and end date of the period for which the type of school applied.

## D.5 One-off datasets

We were also provided with two one-off datasets to enable analysis of tenancy reviews and 3k to work grants. The datasets were:

- » **tenancy\_review.sas7bdat:** File containing summaries of all tenancy reviews conducted by MSD from July 2014 to June 2017. Information included the household, the stage of the review and an outcome.
- » **Grants3ktowork.sas7bdat:** File containing a list of anonymous identifiers and grant dates for recipients of 3k to work grants. The anonymous identifiers matched those used for other benefit system datasets so this information could be linked.

---

<sup>2</sup> <http://www.youthguarantee.net.nz/secondary-tertiary-programmes/>

<sup>3</sup> <http://www.youthguarantee.net.nz/secondary-tertiary-programmes/>



## D.6 Benefit rates

Our analysis requires the conversion of historical payments to “current values”. A series of pdf documents **BenefitRateSummary\_1999-04-01.pdf**, **BenefitRateSummary\_2000-04-01.pdf** etc. has previously been provided showing all benefit rates whenever they were updated (typically 1 April, and occasionally 1 September, each year). A spreadsheet **Benefit Rates pre 1999.XLS** has also previously been provided with values applicable before 1999. All but the most recent benefit rate information was carried across from the previous projection. The most recent information was provided on the MSD website<sup>4</sup>.

## D.7 Historical and forecast economic variables

- » **befu17-charts-data.xls**: Treasury fiscal strategy model, 2017 version. Excel spreadsheet containing historical quarterly values as well as Treasury forecasts for the next five years for each of population, employment and unemployment rates.
- » **disc-rates-jun17.xls**: Excel spreadsheet containing Treasury assumptions for government accounts for future discount and inflation rates as at June 2017.

## D.8 Miscellaneous files

Several other files were either supplied or carried across from the prior years that aided investigation and interpretation, but did not directly feed into the projection:

- » **benefit\_cancellations.sas7bdat**: Contains identifiers for codes related to reasons for leaving benefits
- » **benefit\_codes.sas7bdat**: Contains identifiers for different benefit codes
- » **district\_codes.sas7bdat**: Contains identifiers for district codes and corresponding regions

Various other summary files, file descriptors and overviews were also provided on an ad hoc basis.

---

<sup>4</sup> <https://www.workandincome.govt.nz/products/benefit-rates/benefit-rates-april-2017.html#null>.



## APPENDIX E PROJECTION SCOPE

The aggregate estimate of lifetime housing support cost comprises of many different types of payments and costs. These are:

- » IRRS payments
- » AS payments
- » TAS payments
- » MSD expenses.

Future IRRS payments related to tenancies managed by CHPs are included in the above list. The table below gives further details on this categorisation, with much of the detail provided by MSD. In this table we have attempted consistency with Treasury appropriations<sup>5</sup>.

Multi-Category Expenses and Capital Expenditure	Allocation
<b>Services to Support People to Access Accommodation</b> This category is limited to assessing and reviewing eligibility for social housing and income related rent, social housing register management and the accurate and timely payment of income related rent subsidies to the social housing provider.	MSD expenses
<b>Services Related to the Provision of Social Housing</b> This category is limited to the provision of services related to the provision of social housing by a social housing provider.	MSD expenses
<b>Housing Support Package</b> This category is limited to the provision of incentives, products and services to help households with lower housing need who are in, or seeking social housing, to access or retain alternative housing solutions.	MSD expenses
<b>Part Payment of Rent to Public Housing Providers</b> This appropriation is limited to the part purchase of public housing tenancies for individuals who have both been allocated a public house and had their income-related rent calculated by the public housing agency.	IRRS payments

Benefits or Related Expenses	Allocation
<b>Accommodation Assistance</b> This appropriation is limited to the Accommodation Supplement, Special Transfer Allowance, and Away From Home Allowance to cover accommodation costs, paid in accordance with the criteria set out in the Social Security Act 1964 and delegated legislation issued under that Act. Benefit codes 471, 470, 472, 473, 474 and 832.	AS payments
<b>Temporary Additional Support</b> This appropriation is limited to Temporary Additional Support to provide means-tested temporary financial assistance to persons with emergency or essential costs, paid in accordance with the criteria set out in the Social Security Act 1964 and delegated legislation issued under that Act. Benefit code 450.	TAS payments

<sup>5</sup> For example, the most recent appropriations are <http://www.treasury.govt.nz/budget/2017/estimates/v10/est17-v10-sochou.pdf>



Some program expenses are difficult to isolate and have not been included in the projection scope. Subject to availability, they will be added to future projections. This includes public housing rent debt write-downs and some types of recoverable assistance.

Expenses relating to emergency housing are **not** included in scope as these expenses largely relate to people currently outside the public housing system.

One other set of payments **not** included in scope are maintenance and administrative costs incurred by HNZ. In the private sector, these costs are generally borne by the landlord and are implicitly included in the market rent of a property. By analogy the IRRS includes these costs, and including them would be double-counting. In reality, management costs relating to public housing places may be higher than in the private rental market; we have not attempted to measure this difference.



## APPENDIX F DETAILS ON MODELLING APPROACH

---

### F.1 Generalised linear models

Most of the models used in the projection are generalised linear models so we give a brief overview of the theory behind these models here.

#### F.1.1 Overview

A generalised linear model ('GLM') is a generalisation of ordinary least squares regression that is able to deal with non-normally distributed response variables. Given a response variable  $y$  and a set of independent variables or predictors  $x_1, x_2, \dots, x_n$ , a GLM models the dependency as:

$$y = h^{-1} \left( \sum_{i=1}^n \beta_i x_i \right) + \varepsilon_i \quad (\text{F.1})$$

And

$$E(y) = \mu = h^{-1} \left( \sum_{i=1}^n \beta_i x_i \right) \quad (\text{F.2})$$

Where

$h^{-1}()$  is the **link function**

$\beta_i$  ( $i=1, 2, \dots, n$ ) is the **parameter** corresponding to the dependent variable  $x_i$

$\varepsilon_i$  is an **error** term.

Note that

$$\eta = \sum_{i=1}^n \beta_i x_i \quad (\text{F.3})$$

is referred to as the **linear predictor** and that the GLM may be written as:

$$y = h^{-1}(\eta) + \varepsilon_i \quad (\text{F.4})$$

Thus, a GLM consists of three components:

- » A probability distribution
- » A link function
- » A linear predictor

#### F.1.2 Further detail

##### Probability distribution

In the equations (F.1) and (F.4) above, the error term  $\varepsilon_i$  is determined by the probability distribution of the response variable. Common distributions that may be used include:

- » Normal



- » Poisson
- » Gamma
- » Inverse Gaussian
- » Binomial

The choice of distribution is informed by the response variable. For example, counts are naturally modelled by a Poisson distribution while strictly positive continuous quantities may be appropriately handled by a Gamma or Inverse Gaussian distribution depending on the distribution of the response values. Probabilities may be modelled using a Binomial distribution.

### Link function

The link function  $h^{-1}()$  gives the relationship between the mean of the distribution and the linear predictor. There are many possibilities for the link function including (but not limited to):

- » Identity link:  $h^{-1}(\eta) = \eta$
- » Log link:  $h^{-1}(\eta) = \exp(\eta)$
- » Logit link:  $h^{-1}(\eta) = \exp(\eta)/(1 + \exp(\eta))$

It is usually convenient to choose a link function which matches the domain of the link function to the range of the response variable's mean. In other words, if a response must be positive (for example, an average benefit payment), then a log link will ensure that the fitted value  $\mu$  in equation (F.2) is positive. If the modelled quantity is a probability (for example, the probability of transitioning off benefit in the next quarter), then the logit link ensures that the fitted value lies between 0 and 1, as probabilities must.

### Linear predictor

The linear predictor (equation F.3) is the quantity which incorporates the information about the independent variables into the model and is typically denoted by  $\eta$ .  $\eta$  is expressed as a linear combination of unknown parameters  $\beta_i$  and independent variables  $x_i$  ( $i=1, 2, \dots$ ), which are known.

In all cases, once the probability distribution and the link function have been selected, the linear predictor (F.3) needs to be constructed. The steps to doing this include:

- » Identify the list of independent variables or predictors ( $x_i$ ) to be considered.
- » Using data exploration, modelling techniques, statistical tests and prior knowledge, identify those  $x_i$  that are useful for predicting the response variable. Note that this may include functions of the predictors, rather than the raw predictors themselves.
- » Estimate the parameters  $\beta_i$  using GLM software.

The list of variables considered for the key benefits is given in Section F.5.

### Functions of the predictors

The predictors or independent variables may be used as follows.

- » In their raw forms: For example, gender with two levels F and M.
- » As categorical groupings of the original variable: For example, age may be banded into a number of groups (<18, 18-29, 30-39 etc).
- » As indicator functions depending on the value of the original variable where one condition is assigned the value 1 and the complementary position 0: For example, letting  $I(\text{age} \geq 30)$  be 1 for age  $\geq 30$  and 0 otherwise would fit a step term at age 30.
- » As a spline for underlying raw predictors which are numeric or ordinal (e.g. age, benefit quarter, duration on benefit): The dependency of a linear predictor on duration could be modelled (if



appropriate) by a combination of several line segments. For instance, if the linear predictor varied in a linear fashion with duration with one slope from duration 1 to 4, a different slope from 4 to 12 and a third slope from 12 onwards, then using three line pieces(1-4, 4-12 and 12+) would capture this dependency. The points 4 and 12 where the resulting fitted spline bends are referred to as knot points.

- » As interaction terms: All of the above may be used as interaction terms. For example a duration effect may be well fitted by one spline for those aged under 30 and another for those aged 30 and above. This could be accommodated by interacting the spline with the  $I(\text{age} \geq 30)$  term.

### F.1.3 Model fitting approach

Our typical approach to fitting a model includes the following:

- » First fit a saturated model including most, if not all, raw predictors as well as any known interactions. For continuous predictors like age, or categorical ordered predictors like duration, we would usually fit the predictor as a grouped version (e.g. for age which is in quarter years, we might fit it as integer years).
- » Simplify the model by:
  - Removing insignificant parameters
  - Grouping together related parameters with similar estimated values
  - Using splines where this is warranted
- » Using diagnostics check to see if there is evidence of poor fitting which may suggest the need for some interactions. Add additional terms as required until a satisfactory fit is obtained.

### F.1.4 References

The following books give a complete introduction to GLMs:

- » McCullagh P. and Nelder J. (1989). Generalized linear models, second edition. Chapman and Hall, London UK.
- » Dobson A. J. (2002). An introduction to generalized linear models, second edition. Chapman & Hall/CRC, Florida USA.

For a discussion on the application of GLMs in contexts similar to the modelling of the MSD benefit liabilities (e.g. claim size and claim numbers modelling in insurance), the following papers provide some starting points.

- » England, P. D. and Verrall, R. J. (2002). Stochastic claims reserving in general insurance. British Actuarial Journal, 8 443-544.
- » Haberman, S. and Renshaw, A. E. (1996). Generalized linear models and actuarial science. The Statistician, 45 407-436.
- » Mulquiney, P. and Taylor, G. (2007). Modelling Mortgage Insurance as a multi-state process. Variance 1, 81-102.
- » Taylor, G. and McGuire, G (2004). Loss reserving with GLMs: a case study. Casualty Actuarial Society Discussion Paper Program 2004. Available at <http://www.casact.org/pubs/dpp/dpp04/04dpp327.pdf>

## F.2 Transition models

The modelling involves producing probability estimates for:

- » transitioning from any given housing state to any other each quarter



- » transitioning from any given benefit state to any other each quarter
- » making a register application or moving off the register

In this context, ‘housing state’ refers to if a client is in a public house (PH), receiving Accommodation Supplement (AS) or neither (Nil). Transition probabilities will depend on a client’s state as well as other modelling variables, listed in Section F.5. The transition models are fitted using generalised linear models; further detail on their exact parameterisations is given in Appendix G – Model coefficients.

The transition model approach focuses on understanding how people move through the system over time. It is worth mentioning here that alternatives to such an approach exist (see for instance, the snapshot based approaches used in Section 15 of the 2012 benefit system report for the segmentation analysis). However, we have chosen the transition approach for a number of reasons:

- » **Responsiveness:** Changes in movement behaviour observed in recent years can be correctly reflected in the models.
- » **Long range accuracy:** We are able to leverage the behaviour of clients at various stages of the housing system to make appropriate long range assumptions. For instance, the behaviour of older clients can be used to model the behaviour of the younger clients in the distant future.
- » **Intuitive appeal:** A focus on measures such as probability of entering/exiting housing is natural, and will allow easier drill down analysis.
- » **Consistency:** This approach is used and works well for the benefit system projection, a consistent approach is required to combine the two projections. The significant overlap between these systems means that considerable insight will be gained by a combined approach.

The three housing states and nine benefit states are illustrated diagrammatically in Figure F.1. While there are 9 (3x3) housing transition types and 81 (9x9) different benefit transition types, it is worth noting that the most important transitions are:

- » A household staying unchanged in a public house
- » A primary householder leaving a public house and receiving AS the next quarter
- » A client moving from receiving AS into a public house the next quarter
- » A client remaining in their current benefit state
- » A client moving from benefits to no benefits (moving into the NOB state)
- » A client moving from no benefits back to benefits (moving out of the NOB state)

We also note that the projection population is not equally distributed across the various states. The largest seven states are PH & NOB, AS & JS-WR, AS & JS-HCD, AS & SPS, AS & SLP-HCD, AS & SUP and Nil & NOB. Overall cost of lifetime support results will tend to be dominated by changes to these clients, by sheer weight of numbers.

**Figure F.1 Housing states (left) and benefit states (right) in the projection model**

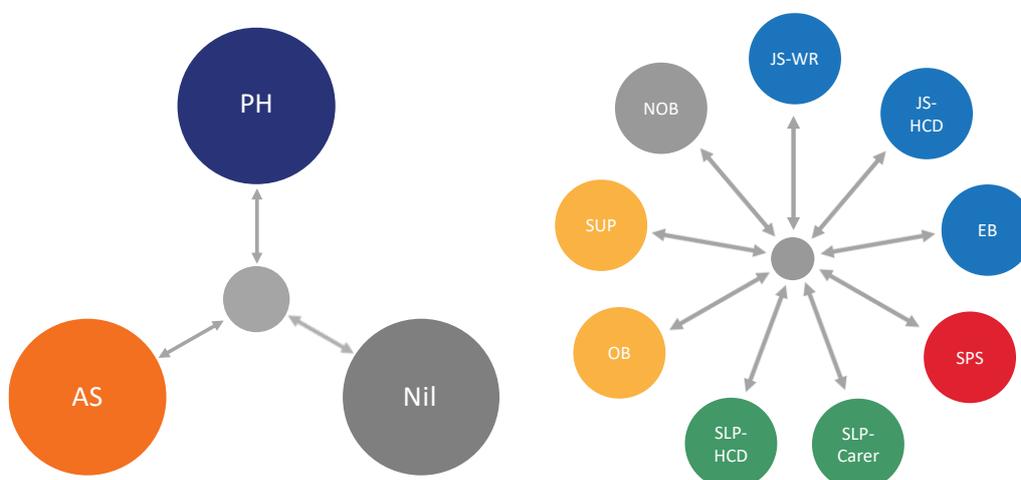


Table F.1 and Table F.2 show the models that have been fit to describe the transition behaviour in the public housing system and benefit system respectively. Detailed parameter values for these models are given in Appendix G, with a brief guide to these provided in Section F.8. All models were GLMs with the standard logistic link, with the exception of eight multinomial models. These multinomial models used the multinomial extension to logistic regression.

**Table F.1 List of housing transition models used in projection**

Housing state	Type	Model ID	Description
PH	Logistic	hou_tra	Probability that a client in a public house and aged <65 remains in a public house the following quarter
PH	Logistic	hou_trap	Probability that a client in a public house and aged >64.75 remains in a public house the following quarter
PH	Logistic	hou_acc	Probability that a primary householder aged <65 and in a public house and exits the public house receives AS the following quarter
PH	Logistic	hou_accp	Probability that a primary householder aged >64.75 and in a public house and exits the public house receives AS the following quarter
PH	Logistic	hou_sec	Probability that a non-primary householder remains in a public house given the primary householder exits
PH	Logistic	hou_sec2	Probability that a non-primary householder remains in a public house given the primary householder remains
AS	Logistic	acc_nil	Probability that an AS client aged <65 does not receive AS in the next quarter, given the client does not move into a public house
AS	Logistic	acc_nilp	Probability that an AS client aged >64.75 does not receive AS in the next quarter, given the client does not move into a public house
Nil	Logistic	nil_acc	Probability a client aged <65 who is not 'Not on benefit' (NOB) receives AS in the next quarter, given they do not move into a public house
Nil	Logistic	nil_accp	Probability a client aged >64.75 who is not 'Not on benefit' (NOB) receives AS in the next quarter, given they do not move into a public house
AS or Nil	Logistic	reg_hou	Probability a client moves from the register to a public house
AS or Nil	Logistic	reg_oth	Probability a client exits the register not to a public house
PH	Logistic	tran1	Probability a client in a public house makes a register application in the quarter
AS or Nil	Logistic	reg1	Probability a client not in a public house makes a register application in the quarter
SH, AS or Nil	Logistic	a_dea	Probability a client aged >64.75 dies



**Table F-2 List of benefit transition models used in projection**

Benefit state	Type	Model ID	Description
JS-WR	Logistic	jwr_tra	Probability that a client remains in JS-WR in the next quarter
JS-WR	Logistic	jwr_nob	Probability that a client moves from JS-WR to NOB, given that they leave JS-WR
JS-WR	Multinomial	jwr_mul	Multinomial Probability of moving to JS-HCD, SLP-HCD, SPS and OTH, conditional on leaving JS-WR and not entering NOB
JS-HCD	Logistic	jhd_tra	Probability that a client remains in JS-HCD in the next quarter
JS-HCD	Logistic	jhd_nob	Probability that a client moves from JS-HCD to NOB, given that they leave JS-HCD
JS-HCD	Multinomial	jhd_mul	Multinomial Probability of moving to JS-WR, SLP-HCD, SPS and OTH, conditional on leaving JS-HCD and not entering NOB
SPS	Logistic	sps_tra	Probability that a client remains in SPS in the next quarter
SPS	Logistic	sps_nob	Probability that a client moves from SPS to NOB, given that they leave SPS
SPS	Multinomial	sps_mul	Multinomial Probability of moving to JS-WR, SLP-HCD, JS-HCD and OTH, conditional on leaving SPS and not entering NOB
SLP-HCD	Logistic	slh_tra	Probability that a client remains in SLP-HCD in the next quarter
SLP-HCD	Logistic	slh_nob	Probability that a client moves from SLP-HCD to NOB, given that they leave SLP-HCD
SLP-HCD	Multinomial	slh_mul	Multinomial Probability of moving to JS-WR, JS-HCD, SPS and OTH, conditional on leaving SLP-HCD and not entering NOB
NOB	Logistic	nob_tra	Probability that a client remains in NOB in the next quarter
NOB	Multinomial	nob_mul	Multinomial Probability of moving to JS-WR, JS-HCD, SPS, SLP-HCD and OTH, conditional on leaving NOB
Other –inwards	Logistic	oi_sup	Probability that someone entering OTH is entering SUP
Other - inwards	Multinomial	oi_mulm	Multinomial probability that someone entering OTH but not SUP enters EB, SLP-Carer or OB
Other	Logistic	o_tra	Probability that someone in OTH leaves their current state
Other	Logistic	o_nob	Probability that someone in OTH moves to NOB, given that they leave their current state
Other	Logistic	o_key	Probability that someone in OTH moves to one of JS-WR, JS-HCD, SPS or SLP-HCD, given that they leave their current state and do not move to NOB
Other	Multinomial	o_mulk	Multinomial probability of moving from OTH to each of JS-WR, JS-HCD, SPS and SLP-HCD, given that they move to one of these states



Benefit state	Type	Model ID	Description
Other	Multinomial	o_mul2	Multinomial probability of moving within OTH to each of SUP, EB, SLP-Carer and OB, given that they move to one of these states

**Notes:**

(a) Other (OTH) in the table refers to benefits other than the main Tier 1 benefits, i.e. SUP, EB, SLP-Carer and OB

The structure is designed to place greater emphasis on the most important transitions; remaining in housing, remaining on the current benefit, moving out of housing, and moving out of the benefit system. Transitions where the client remains in the same state are handled by the models with “tra” suffixes. Transitions out of housing and benefits are handled by models with “nil” and “nob” suffixes respectively.

### F.3 Combining the transition models

The transition models are combined to permit calculation of the probability of moving into any state. This is done on an individual level, but with consideration as to the transitions of others in the household. For example the probability of a non-signatory exiting housing the next quarter is much higher in cases where the primary householder exits, but is still less than one – the individual transition models allow for this. The diagrams below show the steps involved in calculating these probabilities for:

- » A primary householder starting in a public house (PH) and a key benefit state (JS-WR/JS-HCD/SPS/SLP-HCD, here JS-WR)
- » A non-primary (signatory) householder starting in a public house (SH) and off benefits (NOB)



Figure F-2 Transition diagram for a primary householder aged < 65 starting in a key benefit - here JS-WR

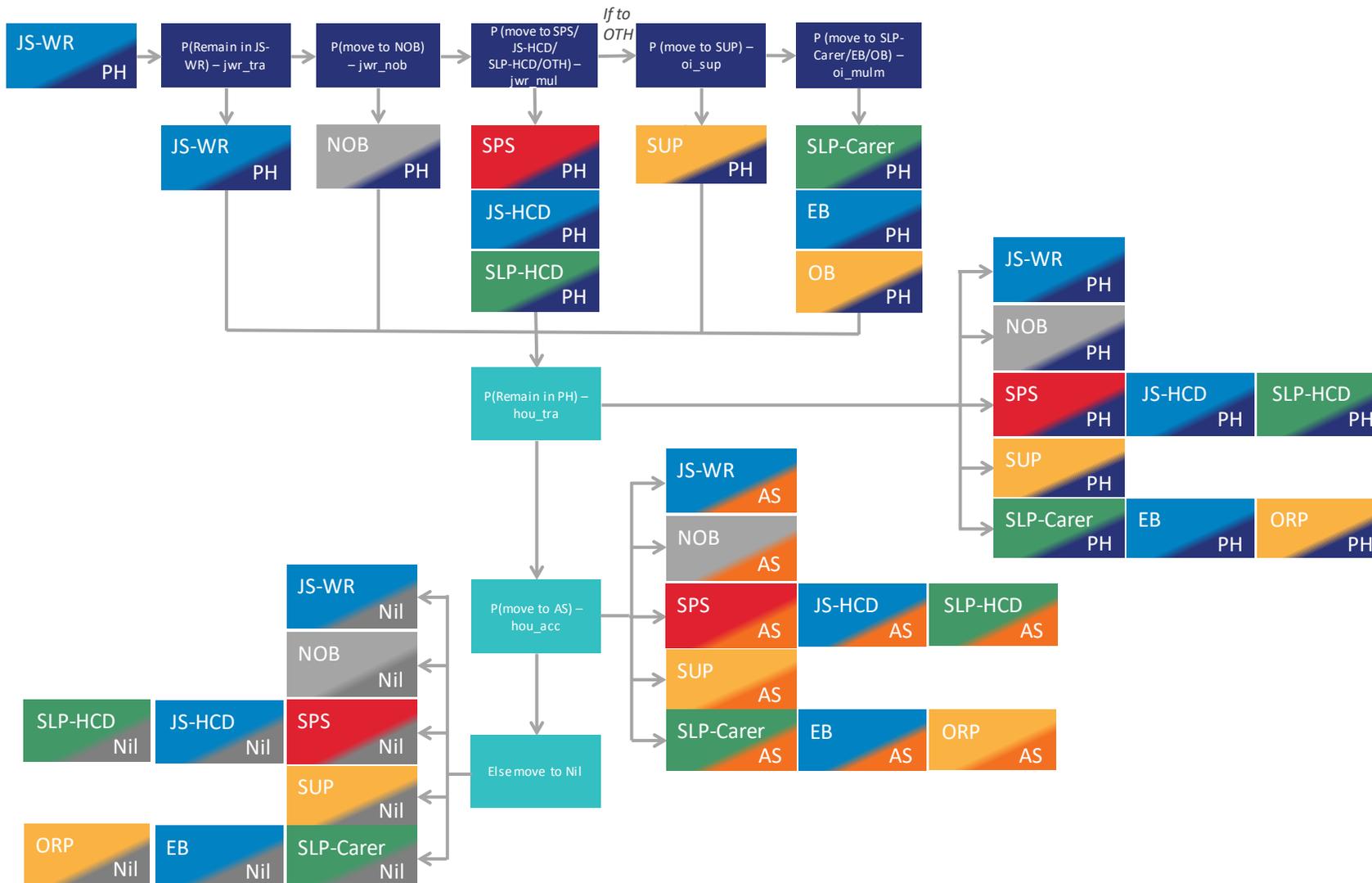
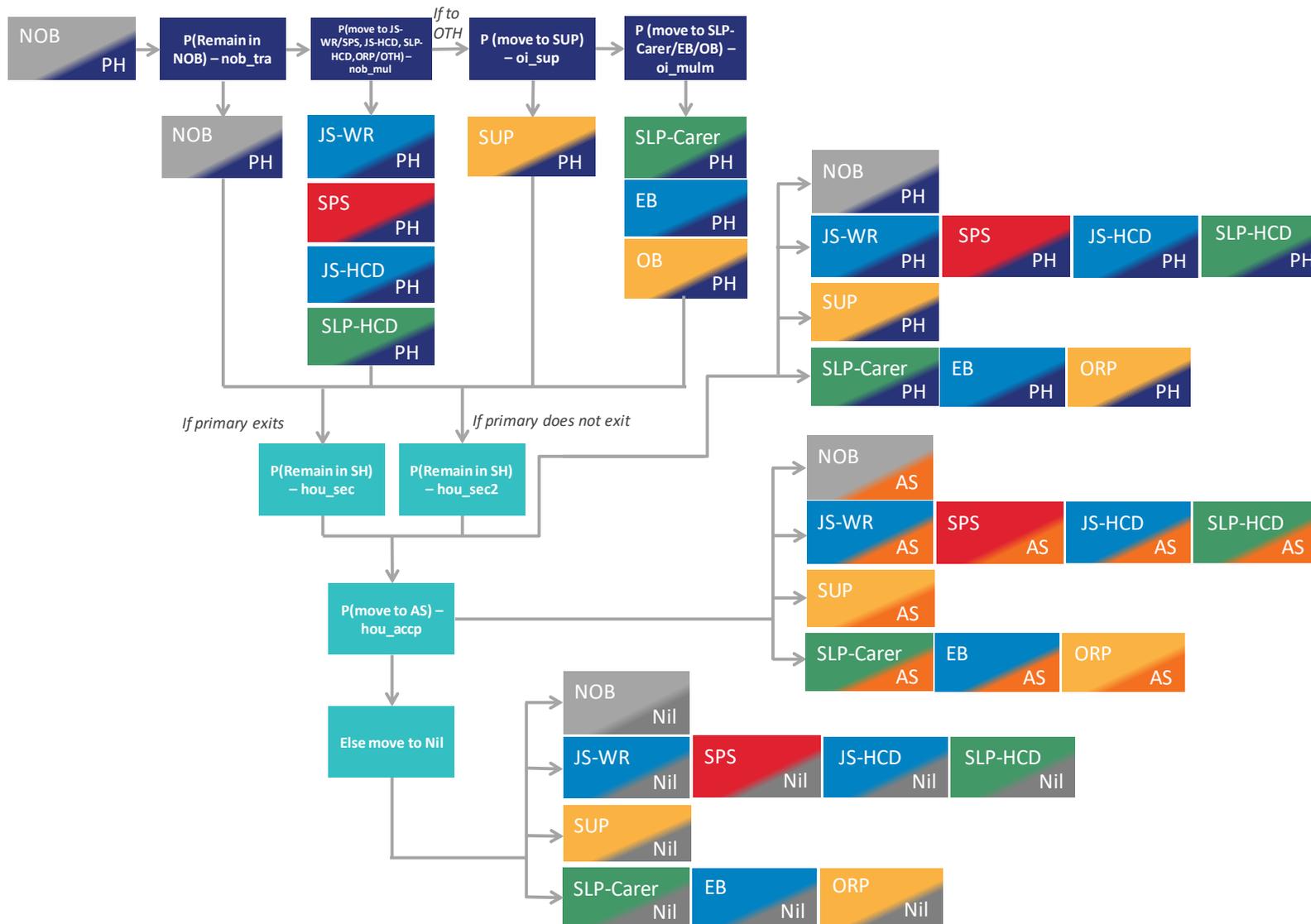


Figure F-3 Transition diagram for a non-primary (signatory) householder aged 65+ starting in a public house (SH) and off benefits (NOB)



## F.4 Payment models

Clients in each state can receive a number of different payment types over the quarter:

- » Income related rent subsidy (IRRS)
- » Accommodation supplement (AS)
- » Their main Tier 1 payment
- » Orphans (or child living alone) Benefit (OB)
- » Disability allowance (DA)
- » Child disability allowance (CDA)
- » Childcare subsidy (CCS)
- » Hardship assistance (HS)
- » Employment intervention payments (EI)
- » Recoverable assistance (LOA in this section)

If we want to be able to distinguish between these various benefits, then separate models are required to estimate each. The models also need to be sensitive to the current state of a client, as well as all their other characteristics listed in Section F.5.

These models are summarised in Table F.2, which shows the payment models required for each of the states. Note that although it is impossible to receive AS while in a public house, it is possible to receive both in a quarter – hence the need to have both an IRRS and AS model for the public housing state.

**Table F.2 Payment models attributable to each state**

Housing state	Benefit state	Payment Type										
		IRRS	AS	TAS	Main T1 (excl OB)	OB	DA	CDA	CCS	HS	EI	LOA
PH	SPS	●	●	●	●	●	●	●	●	●	●	●
PH	SLP-HCD	●	●	●	●	●	●	●	●	●	●	●
PH	JS-HCD	●	●	●	●	●	●	●	●	●	●	●
PH	JS-WR	●	●	●	●	●	●	●	●	●	●	●
PH	SLP-Carer	●	●	●	●	●	●	●	●	●	●	●
PH	EB	●	●	●	●	●	●	●	●	●	●	●
PH	OB	●	●	●	●	●	●	●	●	●	●	●
PH	SUP	●	●	●	●	●	●	●	●	●	●	●
PH	NOB	●	●	●	●	●	●	●	●	●	●	●
AS	SPS	●	●	●	●	●	●	●	●	●	●	●
AS	SLP-HCD	●	●	●	●	●	●	●	●	●	●	●
AS	JS-HCD	●	●	●	●	●	●	●	●	●	●	●
AS	JS-WR	●	●	●	●	●	●	●	●	●	●	●
AS	SLP-Carer	●	●	●	●	●	●	●	●	●	●	●
AS	EB	●	●	●	●	●	●	●	●	●	●	●
AS	OB	●	●	●	●	●	●	●	●	●	●	●
AS	SUP	●	●	●	●	●	●	●	●	●	●	●
AS	NOB	●	●	●	●	●	●	●	●	●	●	●
Nil	SPS	●	●	●	●	●	●	●	●	●	●	●
Nil	SLP-HCD	●	●	●	●	●	●	●	●	●	●	●
Nil	JS-HCD	●	●	●	●	●	●	●	●	●	●	●
Nil	JS-WR	●	●	●	●	●	●	●	●	●	●	●
Nil	SLP-Carer	●	●	●	●	●	●	●	●	●	●	●
Nil	EB	●	●	●	●	●	●	●	●	●	●	●
Nil	OB	●	●	●	●	●	●	●	●	●	●	●
Nil	SUP	●	●	●	●	●	●	●	●	●	●	●
Nil	NOB	●	●	●	●	●	●	●	●	●	●	●

While there are a large number of payment models, we note that the relative significance of each differs greatly. IRRS payments make up over 90% of the payments for housing support, and main benefits plus



accommodation support make up 90% of payments in the benefit system, so these payment types are modelled in greater detail.

It is therefore possible to rationalise the number of models by combining payments of a particular type across recipients in different benefit states. The models fitted are shown in Table F.3. The IRRS payment model and each of the main benefit models are fitted separately as are the larger components of Tier 2 payments (e.g. AS for JS-WR recipients, DA for JS-HCD and SLP-HCD recipients).

**Table F.3 Payment models attributable to each state**

Housing state	Benefit state	Payment Type										
		IRRS	AS	TAS	Main T1 (excl OB)	OB	DA	CDA	CCS	HS	EI	LOA
PH	SPS	hou_irrs2	hou_as	hou_tas	jwr_abp	jwr_orp	a_da	a_cda	a_ccs	jwr_hs	x_ei	jwr_loa
PH	SLP-HCD	hou_irrs2	hou_as	hou_tas	jhd_abp	jhd_orp	jhd_da	a_cda	a_ccs	jhd_hs	a_ei	jhd_loa
PH	JS-HCD	hou_irrs2	hou_as	hou_tas	sps_abp	sps_orp	sps_da	sps_cda	sps_ccs	sps_hs	x_ei	sps_loa
PH	JS-WR	hou_irrs2	hou_as	hou_tas	slh_abp	slh_orp	slh_da	a_cda	a_ccs	slp_hs	a_ei	slh_loa
PH	SLP-Carer	hou_irrs2	hou_as	hou_tas	emb_abp	a_orp	a_da	a_cda	a_ccs	a_hs	x_ei	a_loa
PH	EB	hou_irrs2	hou_as	hou_tas	slc_abp	a_orp	a_da	z_cda	z_ccs	a_hs	a_ei	a_loa
PH	OB	hou_irrs2	hou_as	hou_tas	orp_abp		a_da	z_cda	z_ccs	a_hs	a_ei	a_loa
PH	SUP	hou_irrs2	hou_as	hou_tas			z_da	z_cda	z_ccs	z_hs	a_ei	z_loa
PH	NOB	hou_irrs2	hou_as	hou_tas					nob_ccs	nob_hs	nob_ei	nob_loa
AS	SPS		acc_pmt	acc_tas	jwr_abp	jwr_orp	a_da	a_cda	a_ccs	jwr_hs	x_ei	jwr_loa
AS	SLP-HCD		acc_pmt	acc_tas	jhd_abp	jhd_orp	jhd_da	a_cda	a_ccs	jhd_hs	a_ei	jhd_loa
AS	JS-HCD		acc_pmt	acc_tas	sps_abp	sps_orp	sps_da	sps_cda	sps_ccs	sps_hs	x_ei	sps_loa
AS	JS-WR		acc_pmt	acc_tas	slh_abp	slh_orp	slh_da	a_cda	a_ccs	slp_hs	a_ei	slh_loa
AS	SLP-Carer		acc_pmt	acc_tas	emb_abp	a_orp	a_da	a_cda	a_ccs	a_hs	x_ei	a_loa
AS	EB		acc_pmt	acc_tas	slc_abp	a_orp	a_da	z_cda	z_ccs	a_hs	a_ei	a_loa
AS	OB		acc_pmt	acc_tas	orp_abp		a_da	z_cda	z_ccs	a_hs	a_ei	a_loa
AS	SUP		acc_pmt	acc_tas			z_da	z_cda	z_ccs	z_hs	a_ei	z_loa
AS	NOB		acc_pmt	acc_tas					nob_ccs	nob_hs	nob_ei	nob_loa
Nil	SPS			niltas	jwr_abp	jwr_orp	a_da	a_cda	a_ccs	jwr_hs	x_ei	jwr_loa
Nil	SLP-HCD			niltas	jhd_abp	jhd_orp	jhd_da	a_cda	a_ccs	jhd_hs	a_ei	jhd_loa
Nil	JS-HCD			niltas	sps_abp	sps_orp	sps_da	sps_cda	sps_ccs	sps_hs	x_ei	sps_loa
Nil	JS-WR			niltas	slh_abp	slh_orp	slh_da	a_cda	a_ccs	slp_hs	a_ei	slh_loa
Nil	SLP-Carer			niltas	emb_abp	a_orp	a_da	a_cda	a_ccs	a_hs	x_ei	a_loa
Nil	EB			niltas	slc_abp	a_orp	a_da	z_cda	z_ccs	a_hs	a_ei	a_loa
Nil	OB			niltas	orp_abp		a_da	z_cda	z_ccs	a_hs	a_ei	a_loa
Nil	SUP			niltas			z_da	z_cda	z_ccs	z_hs	a_ei	z_loa
Nil	NOB			niltas					nob_ccs	nob_hs	nob_ei	nob_loa

Some detailed comments on the payment models follow:

- » Payments are allocated by client quarter, or proportionally in the event that payment spells span multiple quarters. Further, all payments are scaled to June 2017 benefit levels, using the CPI index applied to benefit payments over the past 24 years. We have used past increases in DPB/SPS payment levels to infer these CPI increases. Non-CPI increases (such as those seen for AS) come through as additional time series effects in the models. IRRS payments are modelled as a proportion of market rent, rather than as a dollar amount.
- » It is possible to receive more than one Tier 1 benefit in a quarter. We have dealt with this by reallocating all Tier 1 payments to the current state; for example if someone is allocated to JS-WR in a quarter but they receive both JS-WR and JS-HCD, all payments are summed and treated as JS-WR. The overall impact of this allocation is very small, since:
  - The amounts involved are generally small compared to a full quarter’s benefit
  - The allocations largely offset each other (e.g. for every client with a JS-HCD payment allocated to JS-WR there is another with a JS-WR payment allocated to JS-HCD)
  - The average number of quarters before transitions is high enough that such a reallocation occurs in a relatively small proportion of quarters.



- » All models were Poisson with a log link, except the IRRS payment model, which uses a logit link. The choice of distribution was found to have a very minor effect on predictions in the payment models.
- » Table F.3 is a simplification in two ways:
  - It shows the housing payment models for clients up to age 65. For clients aged 65 and above a second model is used with the suffix 'p'. For example, for AS payments, for clients aged 65 and above the model acc\_pmt<sub>p</sub> is used.
  - It shows one IRRS payment model for clients in public housing ('hou\_irrs2'), there is in fact a second model used on the quarter of entry into public housing ('hou\_irrs1').
- » As implied above, some payment models are 'shared' across states – for example, the accommodation supplement payments for all clients in the AS housing state use the 'acc\_pmt' payment model. Similarly the main payment model for clients on Jobseeker support is 'jwr\_abp', this is used regardless of housing state. This sharing is done when the individual models are believed to share similarities to improve the efficiency of modelling. In these cases the current state is also used as a predictor to ensure that any differences between states are still modelled.
- » There is an important point to note regarding the non-main payment models (that is, every column of models except the first, second and fourth in Table F.3). These payments represent an **average** value across people in a given benefit state; thus to take an example, the TAS model for those in the JS-WR state estimates the average TAS paid to clients receiving JS-WR, conditional on all their attributes like age, gender etc. However, in reality some JS-WR clients receive TAS and some do not, so at an individual level these payment models are misleading since the actual TAS payments will usually be much higher (if the client receives TAS) or much lower (if they do not). Thus these payment levels are appropriate for the aggregate and segment level results, but must be interpreted carefully when inspected at an individual level. Distinguishing between the cases of receipt of supplementary payments at an individual level is beyond the scope of this projection.

## F.5 Model predictors

A list of independent variables or predictors used in the various GLM models includes:

- » Age
- » Gender
- » Public housing and benefit history including number of quarters:
  - In current housing state
  - On current benefit
  - Since last in housing
  - Since last on the register for housing
  - Since first benefit
  - Spent in public housing
  - Spent in each of the various benefit states
- » Ethnicity
- » Region (Territorial Local Authority and Board in Auckland)
- » Regional unemployment rates
- » Education related predictors including education attainment level as well as total duration of suspensions and stand-downs at school
- » For those in public housing and/or the register:
  - IRRS level
  - Household size
  - Number of quarters the household has been together
  - Designation of primary and signatory
  - SAS priority of application
  - Market rent for the location
- » Youngest child age and number of registered children (for SPS clients)
- » Partner flag (SLP-HCD, JS-HCD, JS-WR and EB clients)



- » Incapacity type (SLP-HCD and JS-HCD clients)
- » Whether the incapacity belongs to the client's partner (SLP-HCD and JS-HCD clients)
- » Benefit last spell (if any)
- » Housing last spell (if any)
- » Family benefit history ('intergenerational') variables including match type with a parent beneficiary and intensity of the parent's benefit receipt while the client was aged 13-18 (note that this data is available only for those aged 30 or under)
- » Child, Youth and Family history variables which measure a client's exposure to CYF services as a child (note that this data is available only for those aged 30 or under)
- » Criminal conviction history variables which measure a client's convictions and related recent and longer-term exposure to correctional services
- » Relevant client characteristics which depend upon the benefit being received (e.g. Health condition or disability for JS-HCD or SLP-HCD, number and ages of children for SPS, partner information for a number of benefits etc).
- » History of previous benefit sanctions

In theory there are a very large number of variables that would impact on a client's lifetime public housing cost that do not feature in the list above (including health system information, employment history, family status etc.). The omission of a variable does not imply that it is unimportant. Rather, it indicates that our results should be considered as an average over that variable.

The variables may be separated into two categories:

- » **Static variables:** those that remain fixed at all points in time (for example gender).
- » **Dynamic variables:** those that change over time. These may be further subdivided into:
  - Those that vary in a known (deterministic) manner. Examples include quarter, age, the various duration measures, and market rents (given our assumptions of a single set of forecasts for rental growth by future benefit quarter and region).
  - Those that vary in an unknown (stochastic) manner. A client's region, the number of children and age of youngest child for SPS recipients and the incapacity type for HCD clients (JS and SLP) are examples of these predictors.

We generally refer to the last category as "semi-dynamic", recognising that while they change over time, changes are generally slow; the value does not change for most clients every quarter. For example, most clients remain in the same region in the subsequent quarter, but a small proportion move between regions.

A full list of the semi-dynamic variables is given here together with an overview of their updating method. Some detailed examples are then given.

#### F.5.1 List of semi-dynamic predictors

##### Register status

Information on any register applications active during the quarter is stored for all clients.

##### IRRS as a ratio of market rent

The IRRS payment level and the market rent of the house for the area is stored for all clients in public housing.



## Region and TLA

The client's region is stored for every client receiving support. For clients in a public house this is at the Territorial Local Authority (and Board in Auckland) level. Information on the region when last on benefit is retained for those not on benefit.

## Household

Household size, primary and signatory status can all evolve with time. For this projection we have not modelled this evolution.

## Children variables

The number of children (1, 2 or 3+) is stored for SPS recipients, as is the age of the youngest child.

## Partner flag

This is stored for clients in EB, SLP-HCD, JS-HCD and JS-WR. It is not stored for all other benefit types.

## Incapacity variables

The variables relating to incapacity group, the number of incapacities, a flag for whether the client has mental condition as primary incapacity and a flag for whether the incapacity relates to a partner (for cases where the client has a partner) are stored for SLP-HCD and JS-HCD only. The incapacity reassessment frequency is stored for SLP-HCD clients only.

## Education variables for younger clients

The variables indicating whether the client has left school, the attainment level at secondary school, the total days of any suspensions or stand-downs while at school and the highest NQF level of any tertiary enrolments to date are stored for clients aged under 25.

## Benefit sanctions variables

Variable counting the number of sanctions over the past 5 years.

## Child protection and youth justice

Variables specifying whether the client, as a child, was involved in child protection or youth justice services (or both), the number of events, days in child protection and age at first entry into the system are stored for clients up to age 30. These can potentially change for clients up to age 18, but are fixed thereafter.

## Criminal conviction history variables

We used for variables related to criminal conviction and related sentences, available for all clients. These were the percentage of time in prison over the last year, serving any sentence over the last year excluding those for driving offences, serving any sentence over the last ten years excluding driving offences, and in serving a sentence specifically related to theft over the last ten years.

### F.5.2 Updating semi-dynamic predictors

This section discusses the updating methods for each of the semi-dynamic variables. Note that GLMs and probability tables referred to here are presented in the electronic appendices G.

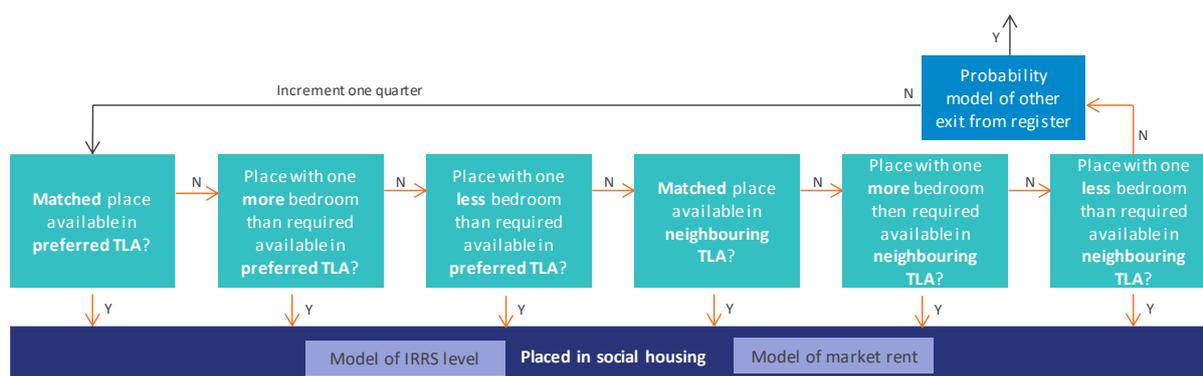


## Register status

The public housing register status of clients is updated as follows:

- » If a client has an active public housing register application:
  - For those not in public housing, a model is used to determine the relative likelihood that clients move from the register to public housing. This likelihood model is data-based, and primarily depends on SAS priority and related underlying need scores. The allocation step uses the likelihood, collective demand for houses of that size and location, and available supply. The figure below shows how we place applications to allow for imperfect matches of size and location. If they do not move from the register to public housing a second model is used to determine the probability they exit the register not to public housing.
  - A similar pair of models are used for clients already in public housing with an active transfer register application.
- » If the client does not have an active public housing register application:
  - For those not in public housing, a model is used to determine the probability a client makes a new application in the quarter. If so a further model and probability table determines the priority of the application and requested location respectively.
  - A similar pair of models and table are used for clients already in public housing who may make a transfer register application.

Figure F.4 Depiction of placement of register applications in projection



## Treatment of households

Households evolve over time; children leave home, singles become partnered and couples can split. The grouping of individuals into households in future years is difficult. Further, the data available is scant; household evolution while in public housing is available, but there is little data for what happens after exiting public housing. We have simplified the treatment of households for tractability:

- » Existing households in public housing or on the register at the projection date are modelled as a group, the movements of one householder will be closely related to the movements of the primary householder. We refer to these as 'real' households.
- » Future households are notional; we model people as individuals and assign them to **notional households** ('Person A is the partner in a household of size four'), but we do not formally link these individuals as a household.
- » Real households (in housing or the register) are dissolved when they exit, as there is limited ability to track household status; all householders become notional. This means for a couple who exit public housing, the future housing state of one is not affected by the other.

## IRRS as a ratio of market rent

For clients entering public housing we simulate the market rent of the house (based on a distribution around first quartile rent levels) and then simulate the expected fraction of market rent that will be paid by IRRS.

For clients remaining in public housing IRRS level is first given a 'default' update:

$$\text{Default IRRS update} = (\text{Old rent} \times \text{rental growth inflation} - \text{old rent}) + \text{old IRRS}$$

The default update is slightly modified when the individuals are on NZ Super. These benefits are indexed to AWE, which we assume grows faster than CPI.

We have a series of models for IRRS updating each quarter:

- » Probability that IRRS level moves from zero to nonzero, or vice versa
- » If it toggles to nonzero, we have a probability table for expected IRRS level (as a fraction of market rent)
- » If IRRS remains nonzero, we have a probability model for whether the new IRRS equals the default update. If not, we apply a probability table for the new IRRS level.

## Region – all benefits

**For clients not in public housing**, region is updated as follows:

**Switching between benefits:** A model is run to determine whether the region changes. If it changes, then the region is sampled from a table of probabilities. The new TLA is then sampled from a second table of probabilities. If the region does not change a second model is run to determine if the TLA changes. If it changes, then the new TLA is sampled from another table of probabilities.

**Returning to benefit after being off benefit for at least one quarter:** a binomial GLM gives the probability that a client's region (last updated when they were last on benefits) has changed while they were off benefit. In each simulation, we sample if the region has changed and if so, the new region is sampled from a table of probabilities. The new TLA is then sampled from a second table of probabilities. If the region has not changed a second model is run to determine if the TLA has changed. If it has, then the new TLA is sampled from another table of probabilities.

**Leaving benefits:** the region is not changed but the current value is stored.

**For clients in public housing**, region and TLA are stored regardless of benefit state. Furthermore, their region and TLA may only change if the client is simulated to apply to the transfer register for rehousing. In this case, a binomial GLM gives the probability that the client applies to the transfer register. The register characteristics (including TLA) are sampled from typical characteristics of clients entering the register. If the register application is successful in the simulation, the client's TLA and region are updated accordingly.

## Children variables - number of children and age of youngest child – SPS only

These variables are updated as follows:

**Entering SPS:** Values for the number of children are sampled from a table of probabilities based on the client's age. Values for the age of the youngest child are sampled from a zero inflated beta model (**aye**).

**Remaining in SPS:** At each quarter

- » A GLM is run to calculate the probability of a new youngest child.
- » If no new youngest child, then the age of the youngest child increments by 0.25 years.



- » If there is a new youngest child, then the age of this child is sampled from a zero inflated beta model. If the model returns 0 as the value, the age of the child is actually spread over 0, 0.25 and 0.5 years by the probabilities 0.2, 0.7 and 0.1 respectively.
- » For all SPS clients, the change in the total number of children is sampled from a multinomial GLM. Note probabilities are different depending on whether there is a new youngest child or not.

**Leaving SPS:** child variable information is forgotten.

#### Partner flag – EB, SLP-HCD, JS-HCD and JS-WR only

The partner flag variable is updated as follows:

**Moving into any of EB/SLP-HCD/JS-HCD/JS-WR from one of the other benefits:** a binomial GLM gives the probability that the client has a partner.

**Remaining in any of EB/SLP-HCD/JS-HCD/JS-WR:** a binomial GLM gives the probability that the partner flag switches (i.e. if the client has a partner they switch to having no partner and vice versa).

**Leaving EB/SLP-HCD/JS-HCD/JS-WR and moving into one of the other benefits:** partner information is dropped.

#### Incapacity variables – incapacity group, number of incapacities, incapacity relating to partner – JS-HCD and SLP-HCD only

The incapacity variables are updated as follows:

##### » **Entry into JS-HCD or SLP-HCD from other benefits:**

- The incapacity group is sampled from a probability table.
- A second probability table is used to simulate the number of incapacities
- If the client has a partner a third probability table is used to determine whether the incapacity relates to the partner or not
- A fourth probability table is used to determine if the client has a psychological incapacity (primary or secondary)
- If entering SLP-HCD the reassessment frequency is sampled from a fifth probability table

There are different SLP probability tables for each of the situations: entry into JS-HCD from all benefits apart from SLP-HCD, entry into SLP-HCD from all benefits apart from JS-HCD, switching from JS-HCD to SLP-HCD and switching from SLP-HCD to JS-HCD.

- » **Remaining in JS-HCD or SLP-HCD:** a binomial GLM gives the probability that the client changed primary incapacity type. If so then a series of probability tables as above are used to simulate the new incapacity variables.
- » **Leaving JS-HCD / SLP-HCD:** incapacity variables are forgotten.

#### Education variables – clients aged under 25 only

The new education variables are updated for matched clients as follows:

##### » **Clients still at school:**

- Are simulated to leave school during the quarter using a probability table. At age 25 the probability is 1.
- If the client leaves school during the quarter the NQF level at exit is sampled from a probability table and the total duration of any stand-downs/suspensions is sampled from a zero inflated log-normal distribution.

##### » **Clients not still at school:**



- New tertiary enrolments are simulated using a probability table.
- If a new enrolment occurs the change in highest NQF level enrolment to date is sampled from a probability table.

### Benefit suspension variables

The number of suspensions in each of the previous 20 quarters are stored to allow the calculation of the number of suspensions in the past 5 years. For each successive quarter, we delete the oldest of the 20 quarters and simulate the newest one. New suspension events in the quarter are sampled from a probability table. If a suspension event occurs the probability that second occurs in the quarter is sampled from a probability table. A maximum of 2 suspensions in any quarter is allowed.

### Child, Youth and Family variables

The Child, Youth and Family (CYF) variables are updated (for clients under age 18) as follows:

- » A binomial GLM is run for the probability of at least one CYF event occurring in the quarter. If yes:
  - A lookup table is used to update the type of interaction (i.e. child protection or youth justice).
  - Another lookup table is used to simulate the number of new events in the quarter (one or more).
  - If it is the first event for a person, the age of entry into CYF is recorded.
- » In both cases of the initial GLM, a binomial GLM is used to simulate the probability that the number of days in a CYF child protection placement changes in the quarter. This is always no if the CYF history does not include child protection.
  - If yes, then two lookup tables are used to simulate how many additional days in placement are applicable.

### Criminal conviction history variables

The proportion of time in prison, non-prison theft sentences and other sentences are stored for the previous 40 quarters, making 120 variables in total. This is sufficient for calculating the four variables used in the transition and payment models. For each successive quarter, we delete the oldest of the 40 quarters and simulate the newest one:

- » If there **was no** sentence served in the previous quarter, a binomial GLM is used to simulate the probability that a new sentence is served in the quarter. The GLM uses a number of demographic characteristics of the individual.
  - If no, then the sentence served variables for the new quarter are set to zero.
  - If yes, then a table is used to allocate which type of sentence is served (prison, theft or other). A second lookup table is then used to allocate the proportion of the quarter served for each non-zero variable.
- » If there **was** a sentence served in the previous quarter, a binomial GLM is used to simulate the probability that a new sentence continues in the new quarter.
  - If no, then the sentence served variables for the new quarter are set to zero.
  - If yes, then an additional binomial GLM is used model the probability that the type of sentence being served changes. Lookup tables for the type and proportion are then used to simulate the new non-zero variables for that quarter.

This allows the 120 variables encoding sentence history to be updated for the new quarter. The four variables used in the models are then re-calculated before transition and payment models are applied.

### F.5.3 Macroeconomic variables

We use private sector level of rents (25<sup>th</sup> percentile, based on data from MBIE) in some housing models.

We use the unemployment rate extensively in benefit system models but not in housing models. This means that the unemployment rate is an important but indirect variable in our housing projection. In our projection higher unemployment rates increase entries into the benefit system which in turn increases register applications.

#### F.5.4 Mortality adjustments

As well as using a mortality model for those aged over 65, we attempt to adjust for improving mortality over time. Statistics New Zealand projects substantial mortality improvements over time<sup>6</sup>; life expectancy should grow by 12 years for females over the next 90 years and by 14 years for males. This means older clients will tend to leave homes slower in the future, as about half of public housing exits for those over 70 is due to death or poor health.

We have allowed for improving mortality rates by 'shifting the age curve to the right' for older clients. So a 73-year-old male in 2024 is assumed to have the same dynamics as a 72-year-old male in 2017, and a 73-year-old male in 2031 is assumed to behave like a 71-year-old male in 2017. We apply this shift for all clients aged over 70, and do so at a rate of 1 year per 26 quarters for males and 1 year per 30 quarters for females.

#### F.6 Overlay models

Due to the housing and benefit state definitions of being in a housing state (PH say) or benefit (SPS say) in a quarter, additional information is needed for segment allocation to know if:

- » The client is in the same state at the end of the quarter and
- » The client has been on benefits continuously throughout the quarter.

We project this using models referred to as 'overlay models,' as they do not affect the main projection results, so they can be regarded as by-products of the simulation.

The overlay models include a full multinomial allocation of benefit type received by a client at the end of a benefit quarter. The process is:

- » Firstly for benefit:
  - The benefit state for the current ("ben\_now") and next quarter ("ben\_next") are determined using the core transition models
  - If ben\_now or ben\_next are NOB (not on benefit), then end of quarter benefit status ("ben\_end") is set to NOB
  - If not, then if ben\_now is NZ Super, then ben\_end is set to NZ Super
  - If not, then a binomial GLM is used for the probability that ben\_end is the same as either ben\_now or ben\_next. If yes, then a lookup table is used to allocate
  - If not, and either ben\_now or ben\_next are SUP, then ben\_end is set to NOB
  - If not, then a binomial GLM is used for the probability that the end of quarter benefit is NOB. If yes, then ben\_end is set to NOB
  - If not and either ben\_now or ben\_next are ORP, then ben\_end is set to ORP
  - If not, then a binomial GLM is used for the probability that the end of quarter benefit is SUP. If yes, then ben\_end is set to SUP
  - If not, then a lookup table is used to simulate the remaining possibilities for ben\_end
- » Then for housing:
  - The housing state for the current ("hou\_now") and next quarter ("hou\_next") are determined using the core transition models

<sup>6</sup> <http://www.stats.govt.nz/methods/research-papers/working-papers-original/forecasting-mortality-14-01.aspx>



- If hou\_now and hou\_next are both PH then the housing end of quarter status (“hou\_end”) is set to PH
- If hou\_now is PH but hou\_next is AS then hou\_end is set to AS
- Similarly if hou\_now is AS but hou\_next is PH then hou\_end is set to AS
- If hou\_now and hou\_next are both AS then a binomial GLM is used to predict if hou\_end is AS or Nil
- A person is on the register at the end of the quarter if they were on the register and failed to exit under the reg\_hou or reg\_exit binomial models (exit to public house and other exit respectively)

Once this chain of logic has been completed, we then update continuous duration. If ben\_end is NOB, then the continuous duration is set to zero. Otherwise a binomial GLM is used to decide whether continuous duration is incremented by 1 (i.e. the client has had no 14 day breaks off benefits in the quarter) or reset to zero (i.e. they did have a 14 day break).

## F.7 Number of new clients model

We allow for new individuals to be added to the projection, at the point at which they are part of a register application. Numbers of individuals entering are a function of:

- » The number of register applications each quarter
- » The number of individuals per application
- » The proportion of future applicants who are not part of the starting projection population, nor a register applicant in an earlier period.

We have each of these components. For entries beyond 10 years into the future, the last bullet requires extrapolation due to data limitations.

For each new client on the register we randomly sample client characteristics from the equivalent population of people entering the system in 2016/17. After entry, their pathway through the housing and benefit system is the same as other individuals in the projection.

## F.8 Guide to electronic Appendix G

The file Appendix G.xlsx contains tables of the parameters for:

- » Each of the models listed in Table F.1 and Table F.3
- » The models for dynamic predictors described in Section F.5.2
- » The overlay models used for simulating continuous duration (Section F.6)
- » The number of future new clients (Section F.7).

Many of the parameters correspond to functions of the predictors rather than the raw predictors (see Section F.1.3); thus each table is accompanied by the formulae giving the derivation of the predictor.

A number of models use offsets in their fitting, particularly for the benefit state transition models. These help lock-in effects (for example, fixing the unemployment rate sensitivity to the same level as previously), as well as encoding some of the projection assumptions. A description of these offsets is also included in Appendix G - Model Coefficients.



## APPENDIX G MODEL COEFFICIENTS

---

Please see the separate spreadsheet for model parameterisations.



# APPENDIX H ACTUAL VERSUS EXPECTED COMPARISONS FOR 2016/17

## H.1 Household level results

### H.1.1 Actual versus expected results by starting segment

#### H.1.1.1 Number of households in public housing during the quarter

Segment			Q1			Q2			Q3			Q4			Average across quarters			
H_seg	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio			
On register	Priority A	110	731	870	84%	947	1,222	78%	1,048	1,359	77%	1,111	1,447	77%	959	1,225	78%	
	Priority B and other	120	139	150	93%	223	231	97%	288	280	103%	329	305	108%	245	241	102%	
IRRS recipients, primary aged <65	Less close / IRRS > \$150	Work obligated	211	8,518	8,581	99%	8,335	8,434	99%	8,203	8,286	99%	8,056	8,121	99%	8,278	8,355	99%
		Child in the household	212	8,365	8,408	99%	8,193	8,283	99%	8,076	8,157	99%	7,924	8,028	99%	8,139	8,219	99%
	No child in the household	NOMB	213	7,538	7,591	99%	7,373	7,462	99%	7,267	7,368	99%	7,143	7,245	99%	7,330	7,416	99%
		Work obligated	214	1,751	1,757	100%	1,710	1,718	100%	1,671	1,680	99%	1,645	1,639	100%	1,694	1,698	100%
	NOMB	215	9,619	9,647	100%	9,464	9,519	99%	9,313	9,383	99%	9,169	9,234	99%	9,391	9,446	99%	
		Work obligated	216	3,291	3,311	99%	3,213	3,249	99%	3,163	3,186	99%	3,112	3,130	99%	3,195	3,219	99%
	Child in the household	221	1,343	1,350	100%	1,300	1,294	101%	1,263	1,238	102%	1,229	1,185	104%	1,284	1,266	101%	
		222	1,224	1,228	100%	1,182	1,187	100%	1,159	1,156	100%	1,130	1,121	101%	1,174	1,173	100%	
	Closer / IRRS ≤ \$150	NOMB	223	3,223	3,246	99%	3,078	3,126	98%	2,956	3,030	98%	2,858	2,945	97%	3,029	3,087	98%
		Work obligated	224	415	418	99%	403	401	100%	393	387	102%	374	364	103%	396	392	101%
	No child in the household	225	2,331	2,334	100%	2,270	2,266	100%	2,217	2,207	100%	2,160	2,154	100%	2,244	2,240	100%	
		NOMB	226	2,202	2,218	99%	2,091	2,142	98%	2,012	2,067	97%	1,945	2,000	97%	2,062	2,106	98%
IRRS recipients, primary aged 65+	Child in the household	311	1,406	1,402	100%	1,381	1,370	101%	1,373	1,343	102%	1,354	1,314	103%	1,378	1,357	102%	
	Less close / IRRS > \$150	312	9,099	9,121	100%	8,895	8,871	100%	8,731	8,658	101%	8,578	8,454	101%	8,826	8,776	101%	
	No child in the household	321	222	220	101%	215	220	98%	212	216	98%	206	208	99%	213	216	99%	
	Child in the household	322	2,730	2,733	100%	2,666	2,648	101%	2,610	2,564	102%	2,564	2,497	103%	2,642	2,611	101%	
Recent exit from housing	Receiving AS	410	42	13	323%	78	39	203%	117	69	171%	149	92	162%	96	53	182%	
	Not receiving AS	Aged <60	420	62	20	310%	96	62	155%	128	96	133%	151	131	115%	109	77	142%
		Aged 60+	430	12	1	1150%	13	0	-	17	1	1650%	20	2	1000%	15	1	1525%
Recent exit from register	Receiving AS	510	42	13	336%	93	29	321%	147	54	274%	192	82	236%	118	44	268%	
	Not receiving AS	520	12	4	329%	31	11	295%	53	15	362%	65	26	255%	40	14	286%	
Total			64,314	64,629	100%	63,248	63,780	99%	62,411	62,794	99%	61,463	61,718	100%	62,859	63,230	99%	

### H.1.1.2 Average IRRS per household (\$)

Segment		H_seg	Q1			Q2			Q3			Q4			Average across quarters			
			Actual	Expected	Ratio	Actual	Expected	Ratio										
On register	Priority A	110	2,012	976	206%	2,847	2,679	106%	2,954	2,848	104%	3,100	2,846	109%	2,728	2,337	117%	
	Priority B and other	120	1,472	954	154%	2,566	2,475	104%	2,774	2,644	105%	2,945	2,671	110%	2,439	2,186	112%	
IRRS recipients, primary aged < 65	Work obligated	211	3,719	3,708	100%	3,759	3,766	100%	3,694	3,703	100%	3,779	3,754	101%	3,738	3,733	100%	
		Child in the household	212	3,857	3,823	101%	3,917	3,886	101%	3,863	3,822	101%	3,980	3,866	103%	3,904	3,849	101%
	Less close / IRRS > \$150	NOMB	213	3,510	3,466	101%	3,551	3,525	101%	3,518	3,456	102%	3,623	3,518	103%	3,551	3,491	102%
		Work obligated	214	3,589	3,546	101%	3,603	3,554	101%	3,530	3,479	101%	3,635	3,545	103%	3,589	3,531	102%
	No child in the household	Not work obligated	215	3,634	3,564	102%	3,669	3,599	102%	3,612	3,520	103%	3,711	3,594	103%	3,657	3,569	102%
		NOMB	216	3,389	3,379	100%	3,413	3,412	100%	3,375	3,330	101%	3,534	3,425	103%	3,428	3,387	101%
	Child in the household	Work obligated	221	1,531	1,448	106%	1,575	1,474	107%	1,608	1,461	110%	1,721	1,496	115%	1,609	1,470	109%
		Not work obligated	222	1,514	1,420	107%	1,606	1,491	108%	1,629	1,484	110%	1,762	1,514	116%	1,628	1,477	110%
	Closer / IRRS ≤ \$150	NOMB	223	1,190	1,001	119%	1,286	1,102	117%	1,348	1,133	119%	1,473	1,214	121%	1,324	1,112	119%
		Work obligated	224	1,606	1,471	109%	1,662	1,496	111%	1,623	1,453	112%	1,705	1,484	115%	1,649	1,476	112%
	No child in the household	Not work obligated	225	1,540	1,475	104%	1,594	1,502	106%	1,591	1,482	107%	1,692	1,510	112%	1,604	1,492	107%
		NOMB	226	1,073	950	113%	1,180	1,018	116%	1,222	1,049	116%	1,317	1,115	118%	1,198	1,033	116%
IRRS recipients, primary aged 65+	Child in the household	311	4,017	3,948	102%	4,090	3,998	102%	4,040	3,926	103%	4,166	4,003	104%	4,078	3,969	103%	
	Less close / IRRS > \$150	312	3,401	3,335	102%	3,421	3,377	101%	3,385	3,316	102%	3,488	3,400	103%	3,424	3,357	102%	
	Child in the household	321	1,278	1,047	122%	1,377	1,095	126%	1,400	1,171	120%	1,483	1,304	114%	1,384	1,154	120%	
	Closer / IRRS ≤ \$150	322	1,329	1,250	106%	1,395	1,286	108%	1,411	1,282	110%	1,514	1,317	115%	1,412	1,284	110%	
Recent exit from housing	Receiving AS	410	1,975	1,017	194%	2,490	2,215	112%	2,564	2,463	104%	2,806	2,362	119%	2,459	2,014	122%	
	Not receiving AS	Aged <60	420	3,222	1,011	319%	2,744	2,353	117%	2,588	2,800	92%	2,903	2,567	113%	2,865	2,183	131%
		Aged 60+	430	2,490	365	681%	2,707	-	-	2,387	1,807	132%	2,418	1,939	125%	2,501	1,370	182%
Recent exit from register	Receiving AS	510	1,617	993	163%	2,229	2,385	93%	2,409	2,425	99%	2,785	2,123	131%	2,260	1,982	114%	
	Not receiving AS	520	1,873	1,085	173%	2,336	2,103	111%	2,296	2,454	94%	2,704	2,022	134%	2,302	1,916	120%	
Total			3,106	3,030	103%	3,166	3,108	102%	3,139	3,065	102%	3,251	3,128	104%	3,165	3,082	103%	

### H.1.1.3 Total IRRS (\$m)

Segment			Q1			Q2			Q3			Q4			Average across quarters		
H_seg	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio		
On register	Priority A	110	1.5	0.8	173%	2.7	3.3	82%	3.1	3.9	80%	3.4	4.1	84%	2.7	3.0	88%
	Priority B and other	120	0.2	0.1	143%	0.6	0.6	100%	0.8	0.7	108%	1.0	0.8	119%	0.6	0.6	112%
	Work obligated	211	31.7	31.8	100%	31.3	31.8	99%	30.3	30.7	99%	30.4	30.5	100%	30.9	31.2	99%
	Child in the household	212	32.3	32.1	100%	32.1	32.2	100%	31.2	31.2	100%	31.5	31.0	102%	31.8	31.6	100%
	NOMB	213	26.5	26.3	101%	26.2	26.3	100%	25.6	25.5	100%	25.9	25.5	102%	26.0	25.9	101%
	Work obligated	214	6.3	6.2	101%	6.2	6.1	101%	5.9	5.8	101%	6.0	5.8	103%	6.1	6.0	101%
	No child in the household	215	35.0	34.4	102%	34.7	34.3	101%	33.6	33.0	102%	34.0	33.2	103%	34.3	33.7	102%
	NOMB	216	11.2	11.2	100%	11.0	11.1	99%	10.7	10.6	101%	11.0	10.7	103%	10.9	10.9	100%
	Work obligated	221	2.1	2.0	105%	2.0	1.9	107%	2.0	1.8	112%	2.1	1.8	119%	2.1	1.9	111%
	Child in the household	222	1.9	1.7	106%	1.9	1.8	107%	1.9	1.7	110%	2.0	1.7	117%	1.9	1.7	110%
	NOMB	223	3.8	3.2	118%	4.0	3.4	115%	4.0	3.4	118%	4.2	3.6	118%	4.0	3.4	117%
	Work obligated	224	0.7	0.6	109%	0.7	0.6	112%	0.6	0.6	113%	0.6	0.5	118%	0.7	0.6	113%
	No child in the household	225	3.6	3.4	104%	3.6	3.4	106%	3.5	3.3	108%	3.7	3.3	112%	3.6	3.3	108%
	NOMB	226	2.4	2.1	112%	2.5	2.2	113%	2.5	2.2	113%	2.6	2.2	115%	2.5	2.2	113%
	Child in the household	311	5.6	5.5	102%	5.6	5.5	103%	5.5	5.3	105%	5.6	5.3	107%	5.6	5.4	104%
	No child in the household	312	30.9	30.4	102%	30.4	30.0	102%	29.6	28.7	103%	29.9	28.7	104%	30.2	29.5	103%
	Child in the household	321	0.3	0.2	123%	0.3	0.2	123%	0.3	0.3	117%	0.3	0.3	113%	0.3	0.2	119%
	No child in the household	322	3.6	3.4	106%	3.7	3.4	109%	3.7	3.3	112%	3.9	3.3	118%	3.7	3.3	111%
	Receiving AS	410	0.1	0.0	627%	0.2	0.1	228%	0.3	0.2	178%	0.4	0.2	192%	0.2	0.1	205%
	Aged <60	420	0.2	0.0	988%	0.3	0.1	181%	0.3	0.3	123%	0.4	0.3	130%	0.3	0.2	160%
	Aged 60+	430	0.0	0.0	7835%	0.0	0.0	-	0.0	0.0	2180%	0.0	0.0	1247%	0.0	0.0	2505%
	Receiving AS	510	0.1	0.0	547%	0.2	0.1	300%	0.4	0.1	272%	0.5	0.2	309%	0.3	0.1	303%
	Not receiving AS	520	0.0	0.0	567%	0.1	0.0	328%	0.1	0.0	339%	0.2	0.1	341%	0.1	0.0	345%
Total		200	196	102%	200	198	101%	196	192	102%	200	193	103%	199	195	102%	

### H.1.1.4 Number of households on the register at the end of the quarter

Segment			Q1			Q2			Q3			Q4			Average across quarters		
H_seg	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio		
On register	Priority A	110	1,812	1,481	122%	1,259	949	133%	949	702	135%	723	509	142%	1,186	910	130%
	Priority B and other	120	1,199	1,083	111%	897	862	104%	712	716	99%	551	594	93%	840	814	103%
	Work obligated	211	254	192	132%	291	184	158%	319	184	173%	314	212	148%	295	193	153%
	Child in the household	212	325	283	115%	406	272	149%	401	251	160%	421	245	172%	388	263	148%
	Less close / IRRS > \$150	213	104	122	85%	135	132	102%	140	153	92%	143	163	88%	131	143	92%
	Work obligated	214	35	26	135%	38	28	136%	39	32	122%	45	33	136%	39	30	132%
	No child in the household	215	281	242	116%	304	223	136%	317	215	147%	346	204	170%	312	221	141%
	NOMB	216	22	26	85%	34	37	92%	34	35	97%	35	37	95%	31	34	93%
	Work obligated	221	45	24	188%	49	29	169%	47	26	181%	49	27	181%	48	27	179%
	Child in the household	222	53	35	151%	59	28	211%	53	30	177%	61	26	235%	57	30	190%
	NOMB	223	30	34	88%	39	41	95%	45	38	118%	46	34	135%	40	37	109%
	Work obligated	224	9	6	150%	10	6	167%	13	5	260%	11	4	275%	11	5	205%
	No child in the household	225	62	46	135%	75	47	160%	81	42	193%	87	39	223%	76	44	175%
	NOMB	226	12	17	71%	23	27	85%	30	27	111%	21	29	72%	22	25	86%
	Child in the household	311	29	27	107%	31	31	100%	28	27	104%	31	28	111%	30	28	105%
	Less close / IRRS > \$150	312	108	108	100%	124	118	105%	137	125	110%	132	123	107%	125	119	106%
	No child in the household	321	6	9	67%	4	8	50%	6	5	120%	5	6	83%	5	7	75%
	Child in the household	322	29	24	121%	29	22	132%	32	26	123%	35	25	140%	31	24	129%
	No child in the household	410	93	29	321%	137	34	403%	155	45	344%	171	50	342%	139	40	352%
	Receiving AS	420	58	44	132%	80	47	170%	87	54	161%	93	58	160%	80	51	157%
	Not receiving AS	430	5	0	-	10	1	1000%	13	2	650%	12	3	400%	10	2	667%
	Aged <60	510	168	21	800%	192	39	492%	202	43	470%	204	40	510%	192	36	536%
	Aged 60+	520	55	8	688%	64	11	582%	68	17	400%	51	22	232%	60	15	410%
	Receiving AS	510	168	21	800%	192	39	492%	202	43	470%	204	40	510%	192	36	536%
	Not receiving AS	520	55	8	688%	64	11	582%	68	17	400%	51	22	232%	60	15	410%
Total		4,794	3,887	123%	4,290	3,176	135%	3,908	2,800	140%	3,587	2,511	143%	4,145	3,094	134%	

### H.1.1.5 Number of new register applications in the quarter

Segment			Q1			Q2			Q3			Q4			Average across quarters		
H_seg	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio		
On register	Priority A	110	8	0	-	51	21	243%	58	34	171%	93	27	344%	53	21	256%
	Priority B and other	120	5	0	-	17	8	213%	28	5	560%	29	11	264%	20	6	329%
IRRS recipients, primary aged < 65	Child in the household	211	114	142	80%	118	115	103%	125	105	119%	125	176	71%	121	135	90%
	Not work obligated	212	144	162	89%	192	137	140%	122	96	127%	159	153	104%	154	137	113%
	NOMB	213	64	116	55%	63	102	62%	57	107	53%	59	103	57%	61	107	57%
	Work obligated	214	15	12	125%	15	16	94%	14	14	100%	20	16	125%	16	15	110%
	No child in the household	215	85	121	70%	78	93	84%	73	98	74%	98	92	107%	84	101	83%
	NOMB	216	14	29	48%	20	37	54%	15	22	68%	14	33	42%	16	30	52%
	Work obligated	221	22	13	169%	17	27	63%	22	15	147%	25	16	156%	22	18	121%
	Child in the household	222	24	16	150%	23	18	128%	19	17	112%	27	18	150%	23	17	135%
	NOMB	223	22	37	59%	22	33	67%	17	25	68%	22	29	76%	21	31	67%
	Work obligated	224	5	4	125%	3	5	60%	5	1	500%	6	7	86%	5	4	112%
IRRS recipients, primary aged 65+	No child in the household	225	24	23	104%	23	25	92%	22	20	110%	23	24	96%	23	23	100%
	NOMB	226	5	19	26%	11	15	73%	11	14	79%	7	18	39%	9	17	52%
	Child in the household	311	18	18	100%	13	17	76%	11	9	122%	13	18	72%	14	16	89%
	Less close / IRRS > \$150	312	33	58	57%	43	59	73%	37	63	59%	30	53	57%	36	58	61%
	No child in the household	321	2	5	40%	0	6	0%	2	1	200%	0	4	0%	1	4	25%
	Child in the household	322	8	10	80%	7	10	70%	7	11	64%	12	12	100%	9	11	79%
Recent exit from housing	Receiving AS	410	112	50	224%	93	40	233%	79	52	152%	92	42	219%	94	46	204%
	Not receiving AS	420	60	63	95%	60	53	113%	50	54	93%	53	47	113%	56	54	103%
	Aged <60	430	7	1	700%	8	1	800%	6	2	300%	7	2	350%	7	2	467%
Recent exit from register	Aged 60+	510	132	34	388%	107	43	249%	100	37	270%	97	34	285%	109	37	295%
	Receiving AS	520	54	12	450%	33	12	275%	31	16	194%	17	13	131%	34	13	255%
	Not receiving AS																
Total			977	945	103%	1,017	893	114%	911	818	111%	1,028	948	108%	983	901	109%

## H.1.2 Actual versus expected results by region

### H.1.2.1 Number of households in public housing during the quarter

Region	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Auck	29,848	29,936	100%	29,425	29,620	99%	29,102	29,282	99%	28,738	28,920	99%	29,278	29,439	99%
Cant	6,100	6,113	100%	6,020	6,024	100%	5,971	5,933	101%	5,888	5,827	101%	5,994	5,974	100%
Central	1,969	1,996	99%	1,932	1,957	99%	1,888	1,906	99%	1,848	1,857	100%	1,909	1,929	99%
East	3,927	3,952	99%	3,827	3,870	99%	3,762	3,794	99%	3,706	3,702	100%	3,805	3,829	99%
Nelson	1,411	1,431	99%	1,380	1,424	97%	1,360	1,395	97%	1,327	1,356	98%	1,369	1,401	98%
Northld	2,094	2,113	99%	2,055	2,074	99%	2,027	2,030	100%	1,977	1,969	100%	2,038	2,046	100%
Plenty	2,848	2,857	100%	2,808	2,823	99%	2,758	2,767	100%	2,716	2,732	99%	2,782	2,794	100%
South	2,361	2,375	99%	2,289	2,332	98%	2,230	2,281	98%	2,189	2,217	99%	2,267	2,301	99%
Taran	1,840	1,859	99%	1,790	1,809	99%	1,747	1,758	99%	1,708	1,703	100%	1,771	1,782	99%
Waik	3,888	3,904	100%	3,809	3,856	99%	3,745	3,786	99%	3,671	3,715	99%	3,778	3,815	99%
Wlgn	8,029	8,096	99%	7,914	7,994	99%	7,823	7,865	99%	7,697	7,722	100%	7,866	7,919	99%
Total	64,314	64,629	100%	63,248	63,780	99%	62,411	62,794	99%	61,463	61,718	100%	62,859	63,230	99%

### H.1.2.2 Average IRRS per household (\$)

Region	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Auck	3,924	3,848	102%	4,003	3,950	101%	3,969	3,894	102%	4,085	3,971	103%	3,996	3,916	102%
Cant	3,052	2,996	102%	3,007	3,012	100%	2,923	2,909	101%	2,952	2,925	101%	2,983	2,961	101%
Central	1,796	1,583	113%	1,830	1,631	112%	1,815	1,618	112%	1,942	1,662	117%	1,846	1,624	114%
East	1,879	1,797	105%	2,016	1,847	109%	2,048	1,814	113%	2,236	1,839	122%	2,045	1,824	112%
Nelson	2,349	2,309	102%	2,406	2,351	102%	2,372	2,312	103%	2,471	2,357	105%	2,399	2,332	103%
Northld	2,056	1,994	103%	2,162	2,091	103%	2,125	2,080	102%	2,175	2,124	102%	2,130	2,072	103%
Plenty	2,428	2,340	104%	2,439	2,436	100%	2,440	2,442	100%	2,477	2,502	99%	2,446	2,430	101%
South	1,882	1,860	101%	1,878	1,917	98%	1,893	1,905	99%	1,935	1,962	99%	1,897	1,911	99%
Taran	1,687	1,631	103%	1,758	1,656	106%	1,721	1,628	106%	1,784	1,661	107%	1,738	1,644	106%
Waik	2,626	2,552	103%	2,638	2,615	101%	2,603	2,581	101%	2,747	2,639	104%	2,653	2,597	102%
Wlgn	2,589	2,523	103%	2,651	2,584	103%	2,632	2,551	103%	2,790	2,601	107%	2,665	2,565	104%
Total	3,106	3,030	103%	3,166	3,108	102%	3,139	3,065	102%	3,251	3,128	104%	3,165	3,082	103%

### H.1.2.3 Total IRRS (\$m)

Region	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Auck	117.1	115.2	102%	117.8	117.0	101%	115.5	114.0	101%	117.4	114.8	102%	117.0	115.3	101%
Cant	18.6	18.3	102%	18.1	18.1	100%	17.5	17.3	101%	17.4	17.0	102%	17.9	17.7	101%
Central	3.5	3.2	112%	3.5	3.2	111%	3.4	3.1	111%	3.6	3.1	116%	3.5	3.1	113%
East	7.4	7.1	104%	7.7	7.1	108%	7.7	6.9	112%	8.3	6.8	122%	7.8	7.0	111%
Nelson	3.3	3.3	100%	3.3	3.3	99%	3.2	3.2	100%	3.3	3.2	103%	3.3	3.3	100%
Nor thld	4.3	4.2	102%	4.4	4.3	102%	4.3	4.2	102%	4.3	4.2	103%	4.3	4.2	102%
Plenty	6.9	6.7	103%	6.8	6.9	100%	6.7	6.8	100%	6.7	6.8	98%	6.8	6.8	100%
South	4.4	4.4	101%	4.3	4.5	96%	4.2	4.3	97%	4.2	4.3	97%	4.3	4.4	98%
Taran	3.1	3.0	102%	3.1	3.0	105%	3.0	2.9	105%	3.0	2.8	108%	3.1	2.9	105%
Waik	10.2	10.0	102%	10.0	10.1	100%	9.7	9.8	100%	10.1	9.8	103%	10.0	9.9	101%
Wlgtn	20.8	20.4	102%	21.0	20.7	102%	20.6	20.1	103%	21.5	20.1	107%	21.0	20.3	103%
Total	200	196	102%	200	198	101%	196	192	102%	200	193	103%	199	195	102%

#### H.1.2.4 Number of households on the register at the end of the quarter

Region	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Auck	2,113	1,855	114%	1,928	1,616	119%	1,754	1,485	118%	1,624	1,325	123%	1,855	1,570	118%
Cant	552	432	128%	491	366	134%	405	317	128%	356	308	116%	451	356	127%
Central	156	91	171%	138	60	230%	134	47	285%	136	43	316%	141	60	234%
East	325	246	132%	266	195	136%	248	156	159%	236	137	172%	269	184	146%
Nelson	133	90	148%	118	46	257%	103	40	258%	100	36	278%	114	53	214%
Nor thld	178	145	123%	162	105	154%	148	96	154%	120	77	156%	152	106	144%
Plenty	388	324	120%	305	252	121%	263	219	120%	233	188	124%	297	246	121%
South	107	85	126%	94	63	149%	97	51	190%	89	48	185%	97	62	157%
Tar an	77	45	171%	68	29	234%	76	25	304%	68	23	296%	72	31	237%
Waik	238	200	119%	194	165	118%	188	146	129%	174	132	132%	199	161	123%
Wlgtn	527	374	141%	526	279	189%	492	218	226%	451	194	232%	499	266	187%
Total	4,794	3,887	123%	4,290	3,176	135%	3,908	2,800	140%	3,587	2,511	143%	4,145	3,094	134%

### H.1.2.5 Number of new register applications in the quarter

Region	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Auck	405	459	88%	445	391	114%	350	359	97%	438	398	110%	410	402	102%
Cant	117	80	146%	128	94	136%	103	86	120%	113	107	106%	115	92	126%
Central	40	16	250%	38	19	200%	48	18	267%	46	33	139%	43	22	200%
East	83	65	128%	57	80	71%	65	54	120%	84	77	109%	72	69	105%
Nelson	35	28	125%	26	19	137%	30	13	231%	33	19	174%	31	20	157%
Northld	35	34	103%	40	27	148%	29	37	78%	27	35	77%	33	33	98%
Plenty	43	38	113%	35	36	97%	39	37	105%	46	33	139%	41	36	113%
South	27	19	142%	33	22	150%	43	22	195%	31	25	124%	34	22	152%
Taran	21	11	191%	20	20	100%	31	20	155%	24	15	160%	24	17	145%
Waik	35	40	88%	38	43	88%	44	49	90%	52	48	108%	42	45	94%
Wlgn	136	155	88%	157	142	111%	129	123	105%	134	158	85%	139	145	96%
Total	977	945	103%	1,017	893	114%	911	818	111%	1,028	948	108%	983	901	109%

### H.1.3 Actual versus expected results by benefit status at projection date

#### H.1.3.1 Number of households in public housing during the quarter

Benefit receipt	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
JWR	5,210	5,256	99%	5,154	5,216	99%	5,106	5,151	99%	5,058	5,049	100%	5,132	5,168	99%
JHD	5,957	5,995	99%	5,930	5,979	99%	5,878	5,914	99%	5,812	5,864	99%	5,894	5,938	99%
SPS	10,478	10,495	100%	10,369	10,396	100%	10,273	10,211	101%	10,119	9,999	101%	10,310	10,275	100%
SLH	10,785	10,851	99%	10,676	10,787	99%	10,579	10,708	99%	10,474	10,563	99%	10,628	10,727	99%
SLC	1,433	1,442	99%	1,436	1,439	100%	1,438	1,421	101%	1,428	1,405	102%	1,433	1,427	100%
SUP	1,175	1,179	100%	1,182	1,181	100%	1,177	1,179	100%	1,170	1,160	101%	1,176	1,175	100%
ORP	271	269	101%	266	263	101%	267	257	104%	263	247	106%	266	259	103%
PEN	13,216	13,246	100%	12,929	12,896	100%	12,702	12,562	101%	12,477	12,261	102%	12,831	12,741	101%
EMB	150	145	104%	150	147	103%	153	146	105%	155	144	108%	152	145	105%
NOB	15,640	15,752	99%	15,156	15,477	98%	14,839	15,249	97%	14,508	15,028	97%	15,036	15,376	98%
Total	64,314	64,629	100%	63,248	63,780	99%	62,411	62,794	99%	61,463	61,718	100%	62,859	63,230	99%

### H.1.3.2 Average IRRS per household (\$)

Benefit receipt	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
JWR	3,283	3,203	103%	3,329	3,265	102%	3,270	3,210	102%	3,358	3,266	103%	3,310	3,236	102%
JHD	3,730	3,619	103%	3,779	3,696	102%	3,734	3,640	103%	3,840	3,697	104%	3,771	3,663	103%
SPS	3,334	3,299	101%	3,399	3,408	100%	3,357	3,374	100%	3,456	3,416	101%	3,387	3,374	100%
SLH	3,106	3,037	102%	3,161	3,109	102%	3,118	3,047	102%	3,229	3,110	104%	3,153	3,076	103%
SLC	3,863	3,769	102%	3,936	3,857	102%	3,876	3,802	102%	4,015	3,851	104%	3,922	3,820	103%
SUP	2,880	2,758	104%	2,977	2,881	103%	3,009	2,826	106%	3,124	2,903	108%	2,997	2,842	105%
ORP	2,900	2,796	104%	3,055	2,867	107%	3,106	2,818	110%	3,197	2,921	109%	3,064	2,850	108%
PEN	3,015	2,943	102%	3,054	2,990	102%	3,030	2,947	103%	3,134	3,020	104%	3,058	2,975	103%
EMB	3,138	3,149	100%	3,287	3,212	102%	3,229	3,116	104%	3,364	3,097	109%	3,255	3,144	104%
NOB	2,683	2,591	104%	2,753	2,676	103%	2,756	2,651	104%	2,885	2,722	106%	2,769	2,660	104%
Total	3,106	3,030	103%	3,166	3,108	102%	3,139	3,065	102%	3,251	3,128	104%	3,165	3,082	103%

### H.1.3.3 Total IRRS (\$m)

Benefit receipt	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
JWR	17.1	16.8	102%	17.2	17.0	101%	16.7	16.5	101%	17.0	16.5	103%	17.0	16.7	102%
JHD	22.2	21.7	102%	22.4	22.1	101%	21.9	21.5	102%	22.3	21.7	103%	22.2	21.7	102%
SPS	34.9	34.6	101%	35.2	35.4	99%	34.5	34.4	100%	35.0	34.2	102%	34.9	34.7	101%
SLH	33.5	33.0	102%	33.7	33.5	101%	33.0	32.6	101%	33.8	32.8	103%	33.5	33.0	102%
SLC	5.5	5.4	102%	5.7	5.5	102%	5.6	5.4	103%	5.7	5.4	106%	5.6	5.4	103%
SUP	3.4	3.3	104%	3.5	3.4	103%	3.5	3.3	106%	3.7	3.4	109%	3.5	3.3	106%
ORP	0.8	0.8	104%	0.8	0.8	108%	0.8	0.7	115%	0.8	0.7	116%	0.8	0.7	111%
PEN	39.8	39.0	102%	39.5	38.6	102%	38.5	37.0	104%	39.1	37.0	106%	39.2	37.9	104%
EMB	0.5	0.5	103%	0.5	0.5	105%	0.5	0.5	109%	0.5	0.4	118%	0.5	0.5	109%
NOB	42.0	40.8	103%	41.7	41.4	101%	40.9	40.4	101%	41.9	40.9	102%	41.6	40.9	102%
Total	200	196	102%	200	198	101%	196	192	102%	200	193	103%	199	195	102%

### H.1.3.4 Number of households on the register at the end of the quarter

Benefit receipt	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
JWR	510	414	123%	451	317	142%	411	264	156%	384	239	161%	439	309	142%
JHD	710	579	123%	609	447	136%	532	381	140%	494	318	155%	586	431	136%
SPS	1,235	882	140%	1,083	676	160%	990	574	172%	884	501	176%	1,048	658	159%
SLH	1,170	872	134%	1,063	695	153%	983	603	163%	907	534	170%	1,031	676	152%
SLC	127	93	137%	127	72	176%	110	59	186%	97	52	187%	115	69	167%
SUP	162	125	130%	120	101	119%	93	79	118%	90	72	125%	116	94	123%
ORP	4	8	50%	6	4	150%	6	5	120%	7	3	233%	6	5	115%
PEN	459	402	114%	412	369	112%	369	335	110%	333	299	111%	393	351	112%
EMB	27	24	113%	19	18	106%	23	16	144%	18	11	164%	22	17	126%
NOB	390	488	80%	400	477	84%	391	484	81%	373	482	77%	389	483	80%
Total	4,794	3,887	123%	4,290	3,176	135%	3,908	2,800	140%	3,587	2,511	143%	4,145	3,094	134%

### H.1.3.5 Number of new register applications in the quarter

Benefit receipt	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
JWR	130	96	135%	123	93	132%	121	87	139%	146	94	155%	130	93	141%
JHD	131	99	132%	128	86	149%	92	76	121%	131	81	162%	121	86	141%
SPS	315	175	180%	330	179	184%	299	148	202%	300	222	135%	311	181	172%
SLH	183	143	128%	162	131	124%	165	141	117%	193	125	154%	176	135	130%
SLC	24	30	80%	39	19	205%	19	14	136%	16	22	73%	25	21	115%
SUP	28	24	117%	24	27	89%	20	19	105%	26	26	100%	25	24	102%
ORP	1	3	33%	5	1	500%	3	1	300%	5	1	500%	4	2	233%
PEN	55	68	81%	54	74	73%	48	57	84%	53	74	72%	53	68	77%
EMB	3	5	60%	4	2	200%	6	3	200%	5	3	167%	5	3	138%
NOB	107	302	35%	148	281	53%	138	272	51%	153	300	51%	137	289	47%
Total	977	945	103%	1,017	893	114%	911	818	111%	1,028	948	108%	983	901	109%

## H.1.4 Actual versus expected results by client age

### H.1.4.1 Number of households in public housing during the quarter

Age	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
16-19	183	216	85%	186	280	67%	184	334	55%	179	393	46%	183	305	60%
20-24	2,033	2,064	99%	1,999	2,047	98%	1,987	2,031	98%	1,961	2,008	98%	1,995	2,037	98%
25-29	4,193	4,196	100%	4,126	4,137	100%	4,087	4,047	101%	4,014	3,952	102%	4,105	4,083	101%
30-34	4,798	4,832	99%	4,705	4,756	99%	4,653	4,671	100%	4,566	4,557	100%	4,680	4,704	99%
35-39	5,398	5,454	99%	5,301	5,402	98%	5,220	5,303	98%	5,128	5,206	98%	5,262	5,341	99%
40-44	6,403	6,432	100%	6,318	6,362	99%	6,217	6,282	99%	6,108	6,163	99%	6,261	6,310	99%
45-49	7,795	7,826	100%	7,680	7,747	99%	7,590	7,652	99%	7,478	7,542	99%	7,636	7,692	99%
50-54	7,843	7,876	100%	7,724	7,801	99%	7,623	7,696	99%	7,533	7,594	99%	7,681	7,741	99%
55-59	6,716	6,740	100%	6,604	6,669	99%	6,538	6,595	99%	6,474	6,502	100%	6,583	6,626	99%
60-64	5,697	5,709	100%	5,641	5,645	100%	5,581	5,586	100%	5,516	5,503	100%	5,609	5,611	100%
65-74	8,160	8,173	100%	8,019	8,009	100%	7,920	7,845	101%	7,821	7,701	102%	7,980	7,932	101%
75-84	4,051	4,069	100%	3,959	3,947	100%	3,873	3,827	101%	3,793	3,725	102%	3,919	3,892	101%
85+	1,042	1,045	100%	984	980	100%	939	930	101%	892	875	102%	964	957	101%
Total	64,313	64,629	100%	63,247	63,780	99%	62,411	62,794	99%	61,462	61,718	100%	62,858	63,230	99%

### H.1.4.2 Average IRRS per household (\$)

Age	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
16-19	2,548	2,166	118%	2,711	2,547	106%	2,521	2,659	95%	2,635	2,477	106%	2,604	2,462	106%
20-24	2,765	2,649	104%	2,863	2,839	101%	2,826	2,831	100%	2,933	2,840	103%	2,847	2,790	102%
25-29	2,937	2,894	101%	3,008	3,005	100%	2,980	2,982	100%	3,090	3,001	103%	3,004	2,971	101%
30-34	3,060	2,987	102%	3,135	3,098	101%	3,111	3,066	101%	3,235	3,097	104%	3,135	3,062	102%
35-39	3,156	3,067	103%	3,229	3,172	102%	3,201	3,142	102%	3,307	3,190	104%	3,223	3,143	103%
40-44	3,134	3,063	102%	3,198	3,153	101%	3,173	3,112	102%	3,286	3,175	103%	3,198	3,126	102%
45-49	3,203	3,126	102%	3,253	3,200	102%	3,223	3,163	102%	3,335	3,236	103%	3,253	3,181	102%
50-54	3,152	3,080	102%	3,216	3,150	102%	3,201	3,096	103%	3,334	3,182	105%	3,226	3,127	103%
55-59	3,203	3,132	102%	3,281	3,199	103%	3,254	3,139	104%	3,364	3,222	104%	3,276	3,173	103%
60-64	3,229	3,142	103%	3,276	3,189	103%	3,236	3,114	104%	3,328	3,194	104%	3,267	3,160	103%
65-74	2,977	2,899	103%	3,013	2,948	102%	2,991	2,907	103%	3,100	2,972	104%	3,020	2,931	103%
75-84	3,067	3,009	102%	3,116	3,051	102%	3,090	3,010	103%	3,192	3,094	103%	3,116	3,041	102%
85+	3,095	3,025	102%	3,120	3,078	101%	3,096	3,015	103%	3,185	3,123	102%	3,124	3,060	102%
<b>Total</b>	<b>3,106</b>	<b>3,030</b>	<b>103%</b>	<b>3,166</b>	<b>3,108</b>	<b>102%</b>	<b>3,139</b>	<b>3,065</b>	<b>102%</b>	<b>3,251</b>	<b>3,128</b>	<b>104%</b>	<b>3,165</b>	<b>3,082</b>	<b>103%</b>

### H.1.4.3 Total IRRS (\$m)

Age	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
16-19	0.5	0.5	100%	0.5	0.7	71%	0.5	0.9	52%	0.5	1.0	49%	0.5	0.8	63%
20-24	5.6	5.5	103%	5.7	5.8	98%	5.6	5.7	98%	5.8	5.7	101%	5.7	5.7	100%
25-29	12.3	12.1	101%	12.4	12.4	100%	12.2	12.1	101%	12.4	11.9	105%	12.3	12.1	102%
30-34	14.7	14.4	102%	14.7	14.7	100%	14.5	14.3	101%	14.8	14.1	105%	14.7	14.4	102%
35-39	17.0	16.7	102%	17.1	17.1	100%	16.7	16.7	100%	17.0	16.6	102%	17.0	16.8	101%
40-44	20.1	19.7	102%	20.2	20.1	101%	19.7	19.6	101%	20.1	19.6	103%	20.0	19.7	101%
45-49	25.0	24.5	102%	25.0	24.8	101%	24.5	24.2	101%	24.9	24.4	102%	24.8	24.5	102%
50-54	24.7	24.3	102%	24.8	24.6	101%	24.4	23.8	102%	25.1	24.2	104%	24.8	24.2	102%
55-59	21.5	21.1	102%	21.7	21.3	102%	21.3	20.7	103%	21.8	20.9	104%	21.6	21.0	103%
60-64	18.4	17.9	103%	18.5	18.0	103%	18.1	17.4	104%	18.4	17.6	104%	18.3	17.7	103%
65-74	24.3	23.7	103%	24.2	23.6	102%	23.7	22.8	104%	24.2	22.9	106%	24.1	23.2	104%
75-84	12.4	12.2	101%	12.3	12.0	102%	12.0	11.5	104%	12.1	11.5	105%	12.2	11.8	103%
85+	3.2	3.2	102%	3.1	3.0	102%	2.9	2.8	104%	2.8	2.7	104%	3.0	2.9	103%
Total	200	196	102%	200	198	101%	196	192	102%	200	193	103%	199	195	102%

#### H.1.4.4 Number of households on the register at the end of the quarter

Age	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
16-19	83	135	61%	73	155	47%	65	155	42%	60	175	34%	70	155	45%
20-24	424	350	121%	405	280	145%	381	255	149%	376	241	156%	397	282	141%
25-29	614	451	136%	513	356	144%	447	302	148%	408	270	151%	496	345	144%
30-34	589	433	136%	509	328	155%	471	282	167%	452	234	193%	505	319	158%
35-39	484	367	132%	430	306	141%	397	265	150%	350	233	150%	415	293	142%
40-44	474	371	128%	443	282	157%	401	238	168%	361	225	160%	420	279	150%
45-49	498	412	121%	450	332	136%	420	284	148%	373	247	151%	435	319	137%
50-54	498	417	119%	457	324	141%	412	288	143%	357	242	148%	431	318	136%
55-59	381	317	120%	341	248	138%	314	218	144%	289	198	146%	331	245	135%
60-64	290	230	126%	257	194	132%	230	177	130%	228	145	157%	251	187	135%
65-74	324	288	113%	288	267	108%	256	238	108%	234	215	109%	276	252	109%
75-84	125	105	119%	116	95	122%	106	88	120%	90	77	117%	109	91	120%
85+	10	11	91%	8	9	89%	8	10	80%	9	9	100%	9	10	90%
Total	4,794	3,887	123%	4,290	3,176	135%	3,908	2,800	140%	3,587	2,511	143%	4,145	3,094	134%

### H.1.4.5 Number of new register applications in the quarter

Age	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio
16-19	21	108	19%	25	117	21%	26	104	25%	22	139	16%	24	117	20%
20-24	138	124	111%	153	99	155%	147	119	124%	166	130	128%	151	118	128%
25-29	169	114	148%	159	103	154%	149	84	177%	158	125	126%	159	107	149%
30-34	151	88	172%	142	89	160%	142	74	192%	163	105	155%	150	89	168%
35-39	110	101	109%	111	105	106%	96	78	123%	107	86	124%	106	93	115%
40-44	80	91	88%	109	68	160%	77	61	126%	91	73	125%	89	73	122%
45-49	82	80	103%	82	82	100%	77	71	108%	81	64	127%	81	74	108%
50-54	65	77	84%	86	67	128%	71	81	88%	75	53	142%	74	70	107%
55-59	68	63	108%	57	52	110%	41	50	82%	55	63	87%	55	57	97%
60-64	38	30	127%	39	36	108%	36	39	92%	57	35	163%	43	35	121%
65-74	37	42	88%	37	48	77%	30	35	86%	42	54	78%	37	45	82%
75-84	16	19	84%	17	26	65%	16	19	84%	9	18	50%	15	21	71%
85+	2	8	25%	0	1	0%	3	3	100%	2	3	67%	2	4	47%
<b>Total</b>	<b>977</b>	<b>945</b>	<b>103%</b>	<b>1,017</b>	<b>893</b>	<b>114%</b>	<b>911</b>	<b>818</b>	<b>111%</b>	<b>1,028</b>	<b>948</b>	<b>108%</b>	<b>983</b>	<b>901</b>	<b>109%</b>

### H.1.5 Actual versus expected results by client ethnicity

#### H.1.5.1 Number of households in public housing during the quarter

Ethnicity	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio
Asian	3,378	3,396	99%	3,359	3,356	100%	3,333	3,322	100%	3,292	3,286	100%	3,340	3,340	100%
Maori	22,993	23,117	99%	22,585	22,822	99%	22,226	22,410	99%	21,850	21,936	100%	22,413	22,571	99%
NZEU	16,475	16,576	99%	16,139	16,319	99%	15,896	16,037	99%	15,633	15,728	99%	16,036	16,165	99%
Pisland	16,066	16,083	100%	15,831	15,907	100%	15,683	15,714	100%	15,468	15,526	100%	15,762	15,807	100%
Other	5,402	5,459	99%	5,334	5,377	99%	5,274	5,313	99%	5,220	5,244	100%	5,307	5,348	99%
<b>Total</b>	<b>64,314</b>	<b>64,629</b>	<b>100%</b>	<b>63,248</b>	<b>63,780</b>	<b>99%</b>	<b>62,411</b>	<b>62,794</b>	<b>99%</b>	<b>61,463</b>	<b>61,718</b>	<b>100%</b>	<b>62,859</b>	<b>63,230</b>	<b>99%</b>

### H.1.5.2 Average IRRS per household (\$)

Segment	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Asian	3,438	3,298	104%	3,488	3,385	103%	3,441	3,348	103%	3,550	3,407	104%	3,479	3,359	104%
Maori	2,888	2,824	102%	2,953	2,906	102%	2,932	2,871	102%	3,050	2,926	104%	2,956	2,882	103%
NZEU	2,785	2,717	103%	2,814	2,771	102%	2,779	2,722	102%	2,873	2,782	103%	2,813	2,748	102%
Pisland	3,578	3,502	102%	3,667	3,592	102%	3,643	3,542	103%	3,758	3,617	104%	3,661	3,563	103%
Other	3,399	3,292	103%	3,446	3,386	102%	3,408	3,336	102%	3,529	3,386	104%	3,445	3,350	103%
<b>Total</b>	<b>3,106</b>	<b>3,030</b>	<b>103%</b>	<b>3,166</b>	<b>3,108</b>	<b>102%</b>	<b>3,139</b>	<b>3,065</b>	<b>102%</b>	<b>3,251</b>	<b>3,128</b>	<b>104%</b>	<b>3,165</b>	<b>3,082</b>	<b>103%</b>

### H.1.5.3 Total IRRS (\$m)

Segment	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Asian	11.6	11.2	104%	11.7	11.4	103%	11.5	11.1	103%	11.7	11.2	104%	11.6	11.2	104%
Maori	66.4	65.3	102%	66.7	66.3	101%	65.2	64.3	101%	66.7	64.2	104%	66.2	65.0	102%
NZEU	45.9	45.0	102%	45.4	45.2	100%	44.2	43.6	101%	44.9	43.8	103%	45.1	44.4	102%
Pisland	57.5	56.3	102%	58.0	57.1	102%	57.1	55.7	103%	58.1	56.2	104%	57.7	56.3	102%
Other	18.4	18.0	102%	18.4	18.2	101%	18.0	17.7	101%	18.4	17.8	104%	18.3	17.9	102%
<b>Total</b>	<b>200</b>	<b>196</b>	<b>102%</b>	<b>200</b>	<b>198</b>	<b>101%</b>	<b>196</b>	<b>192</b>	<b>102%</b>	<b>200</b>	<b>193</b>	<b>103%</b>	<b>199</b>	<b>195</b>	<b>102%</b>

### H.1.5.4 Number of households on the register at the end of the quarter

Segment	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Asian	298	251	119%	276	212	130%	259	193	134%	231	163	142%	266	205	130%
Maori	2,057	1,597	129%	1,842	1,245	148%	1,684	1,072	157%	1,544	973	159%	1,782	1,222	146%
NZEU	1,174	920	128%	1,039	748	139%	945	662	143%	847	572	148%	1,001	726	138%
Pisland	731	697	105%	660	611	108%	586	559	105%	568	519	109%	636	597	107%
Other	534	422	127%	473	360	131%	434	314	138%	397	284	140%	460	345	133%
<b>Total</b>	<b>4,794</b>	<b>3,887</b>	<b>123%</b>	<b>4,290</b>	<b>3,176</b>	<b>135%</b>	<b>3,908</b>	<b>2,800</b>	<b>140%</b>	<b>3,587</b>	<b>2,511</b>	<b>143%</b>	<b>4,145</b>	<b>3,094</b>	<b>134%</b>

### H.1.5.5 Number of new register applications in the quarter

Segment	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Asian	34	50	68%	51	44	116%	41	42	98%	35	46	76%	40	46	88%
Maori	471	385	122%	505	383	132%	450	360	125%	499	418	119%	481	387	125%
NZEU	210	168	125%	182	167	109%	187	155	121%	203	160	127%	196	163	120%
P Island	177	253	70%	197	227	87%	156	186	84%	209	230	91%	185	224	82%
Other	85	89	96%	82	72	114%	77	75	103%	82	94	87%	82	83	99%
Total	977	945	103%	1,017	893	114%	911	818	111%	1,028	948	108%	983	901	109%

## H.2 Individual client level results

### H.2.1 Actual versus expected results by starting segment

#### H.1.1.1 Number of clients not in public housing but receiving AS during the quarter

Segment			Q1			Q2			Q3			Q4			Average across quarters		
H_seg	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio		
On register	Priority A	110	1,761	1,579	112%	1,527	1,264	121%	1,440	1,171	123%	1,341	1,051	128%	1,517	1,266	120%
	Priority B and other	120	1,282	1,236	104%	1,186	1,134	105%	1,129	1,055	107%	1,079	987	109%	1,169	1,103	106%
IRRS recipients, primary aged <65	Child in the household	211	24	0	-	211	187	113%	353	351	101%	508	508	100%	274	262	105%
	Not wor k obligated	212	36	0	-	239	185	129%	390	364	107%	553	489	113%	305	260	117%
	NOMB	213	20	0	-	118	108	109%	204	185	110%	309	256	121%	163	137	119%
	Less close / IRRS>\$150	214	6	0	-	44	36	122%	75	75	100%	93	97	96%	55	52	105%
	Wor k obligated	215	36	0	-	189	139	136%	326	295	111%	439	444	99%	248	220	113%
	No child in the household	216	10	0	-	60	42	143%	104	83	125%	151	126	120%	81	63	129%
	NOMB	221	4	0	-	46	56	82%	75	99	76%	104	137	76%	57	73	78%
	Wor k obligated	222	10	0	-	42	41	102%	69	72	96%	94	93	101%	54	52	104%
	Child in the household	223	12	0	-	50	56	89%	121	112	108%	162	162	100%	86	83	105%
	NOMB	224	2	0	-	14	18	78%	18	28	64%	29	37	78%	16	21	76%
Wor k obligated	225	2	0	-	38	46	83%	68	94	72%	107	127	84%	54	67	81%	
No child in the household	226	5	0	-	45	22	205%	73	44	166%	94	70	134%	54	34	160%	
NOMB	311	5	0	-	31	16	194%	50	41	122%	72	58	124%	40	29	137%	
Child in the household	312	20	0	-	68	87	78%	138	150	92%	175	201	87%	100	110	92%	
No child in the household	321	2	0	-	5	3	167%	9	7	129%	15	14	107%	8	6	129%	
Child in the household	322	7	0	-	20	24	83%	34	34	100%	37	54	69%	25	28	88%	
No child in the household																	
Recent exit from housing	Receiving AS	410	3,021	3,113	97%	2,733	2,800	98%	2,536	2,583	98%	2,389	2,373	101%	2,670	2,717	98%
	Not receiving AS	420	611	741	82%	844	1,172	72%	961	1,402	69%	987	1,465	67%	851	1,195	71%
	Aged <60																
	Aged 60+	430	25	60	42%	37	81	46%	41	93	44%	48	110	44%	38	86	44%
Recent exit from register	Receiving AS	510	3,041	3,088	98%	2,827	2,851	99%	2,664	2,746	97%	2,530	2,551	99%	2,766	2,809	98%
	Not receiving AS	520	245	203	121%	338	305	111%	362	351	103%	359	345	104%	326	301	108%
Total			10,187	10,020	102%	10,712	10,673	100%	11,240	11,435	98%	11,675	11,755	99%	10,954	10,971	100%

### H.1.1.2 Average AS payment per client (\$)

Segment		H_seg	Q1			Q2			Q3			Q4			Average across quarters			
			Actual	Expected	Ratio	Actual	Expected	Ratio										
On register	Priority A	110	821	801	102%	878	815	108%	884	842	105%	905	866	105%	872	831	105%	
	Priority B and other	120	985	795	124%	1,018	811	126%	1,023	877	117%	1,045	885	118%	1,018	842	121%	
IRRS recipients, primary aged < 65	Work obligated	211	476	-	-	824	807	102%	792	795	100%	843	812	104%	734	805	91%	
		Child in the household	212	659	-	-	882	822	107%	830	786	106%	859	807	106%	807	805	100%
	Less close / IRRS > \$150	NOMB	213	902	-	-	765	761	101%	761	738	103%	766	726	106%	799	742	108%
		Work obligated	214	729	-	-	758	555	137%	701	586	120%	659	588	112%	712	576	123%
	No child in the household	Not work obligated	215	466	-	-	604	636	95%	665	636	105%	702	660	106%	609	644	95%
		NOMB	216	455	-	-	612	593	103%	606	562	108%	595	609	98%	567	588	96%
	Work obligated	221	489	-	-	636	623	102%	604	670	90%	625	704	89%	589	666	88%	
		Child in the household	222	399	-	-	659	584	113%	625	573	109%	626	631	99%	577	596	97%
	Closer / IRRS ≤ \$150	NOMB	223	479	-	-	457	566	81%	530	577	92%	625	596	105%	523	580	90%
		Work obligated	224	401	-	-	342	421	81%	342	417	82%	458	453	101%	386	430	90%
	No child in the household	Not work obligated	225	381	-	-	475	506	94%	488	505	97%	459	530	87%	451	514	88%
		NOMB	226	713	-	-	445	539	83%	613	496	124%	594	514	115%	591	517	114%
IRRS recipients, primary aged 65+	Child in the household	311	811	-	-	963	881	109%	956	792	121%	855	773	111%	896	815	110%	
		No child in the household	312	517	-	-	648	635	102%	643	663	97%	692	692	100%	625	663	94%
	Child in the household	321	913	-	-	775	520	149%	577	693	83%	630	577	109%	724	597	121%	
		No child in the household	322	370	-	-	504	381	132%	509	502	101%	543	488	111%	482	457	105%
Recent exit from housing	Receiving AS	410	760	762	100%	782	795	98%	780	785	99%	801	809	99%	781	788	99%	
	Not receiving AS	Aged <60	420	371	468	79%	497	487	102%	539	513	105%	587	546	108%	498	503	99%
		Aged 60+	430	471	510	92%	514	637	81%	561	652	86%	566	671	84%	528	618	86%
Recent exit from register	Receiving AS	510	972	923	105%	984	933	105%	973	907	107%	978	931	105%	977	923	106%	
	Not receiving AS	520	368	553	67%	561	577	97%	603	610	99%	660	649	102%	548	597	92%	
Total			825	795	104%	837	784	107%	822	770	107%	833	781	107%	829	782	106%	

### H.1.1.3 Total AS payments (\$m)

Segment			Q1			Q2			Q3			Q4			Average across quarters		
H_seg	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio		
On register	Priority A	110	1.45	1.27	114%	1.34	1.03	130%	1.3	1.0	129%	1.21	0.91	133%	1.32	1.05	126%
	Priority B and other	120	1.26	0.98	128%	1.21	0.92	131%	1.2	0.9	125%	1.13	0.87	129%	1.19	0.93	128%
IRRS recipients, primary aged < 65	Work obligated	211	0.01	0.00	-	0.17	0.15	115%	0.3	0.3	100%	0.43	0.41	104%	0.22	0.21	106%
	Child in the household	212	0.02	0.00	-	0.21	0.15	139%	0.3	0.3	113%	0.47	0.39	120%	0.26	0.21	124%
	NOMB	213	0.02	0.00	-	0.09	0.08	110%	0.2	0.1	114%	0.24	0.19	128%	0.13	0.10	124%
	Work obligated	214	0.00	0.00	-	0.03	0.02	167%	0.1	0.0	120%	0.06	0.06	107%	0.04	0.03	125%
	No child in the household	215	0.02	0.00	-	0.11	0.09	129%	0.2	0.2	116%	0.31	0.29	105%	0.16	0.14	115%
	NOMB	216	0.00	0.00	-	0.04	0.02	147%	0.1	0.0	135%	0.09	0.08	117%	0.05	0.04	131%
	Work obligated	221	0.00	0.00	-	0.03	0.03	84%	0.0	0.1	68%	0.06	0.10	67%	0.04	0.05	72%
	Child in the household	222	0.00	0.00	-	0.03	0.02	116%	0.0	0.0	105%	0.06	0.06	100%	0.03	0.03	108%
	NOMB	223	0.01	0.00	-	0.02	0.03	72%	0.1	0.1	99%	0.10	0.10	105%	0.05	0.05	101%
	Work obligated	224	0.00	0.00	-	0.00	0.01	63%	0.0	0.0	53%	0.01	0.02	79%	0.01	0.01	69%
	No child in the household	225	0.00	0.00	-	0.02	0.02	78%	0.0	0.0	70%	0.05	0.07	73%	0.03	0.03	73%
	NOMB	226	0.00	0.00	-	0.02	0.01	169%	0.0	0.0	205%	0.06	0.04	155%	0.03	0.02	178%
IRRS recipients, primary aged 65+	Child in the household	311	0.00	0.00	-	0.03	0.01	212%	0.0	0.0	147%	0.06	0.04	137%	0.04	0.02	157%
	Less close / IRRS > \$150	312	0.01	0.00	-	0.04	0.06	80%	0.1	0.1	89%	0.12	0.14	87%	0.07	0.07	90%
	No child in the household	321	0.00	0.00	-	0.00	0.00	249%	0.0	0.0	107%	0.01	0.01	117%	0.01	0.00	140%
	Child in the household	322	0.00	0.00	-	0.01	0.01	110%	0.0	0.0	101%	0.02	0.03	76%	0.01	0.01	95%
Recent exit from housing	Receiving AS	410	2.30	2.37	97%	2.14	2.23	96%	2.0	2.0	97%	1.91	1.92	100%	2.08	2.14	97%
	Not receiving AS	420	0.23	0.35	65%	0.42	0.57	73%	0.5	0.7	72%	0.58	0.80	72%	0.44	0.61	72%
	Aged <60	430	0.01	0.03	39%	0.02	0.05	37%	0.0	0.1	38%	0.03	0.07	37%	0.02	0.05	37%
Recent exit from register	Receiving AS	510	2.96	2.85	104%	2.78	2.66	105%	2.6	2.5	104%	2.47	2.37	104%	2.70	2.59	104%
	Not receiving AS	520	0.09	0.11	80%	0.19	0.18	108%	0.2	0.2	102%	0.24	0.22	106%	0.18	0.18	101%
Total			8	8	106%	9	8	107%	9	9	105%	10	9	106%	9	9	106%

## H.2.2 Actual versus expected results by region

### H.1.2.1 Number of clients not in public housing but receiving AS during the quarter

Region	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Auck	4,003	4,056	99%	4,194	4,331	97%	4,424	4,631	96%	4,616	4,704	98%	4,309	4,431	97%
Cant	1,121	1,112	101%	1,193	1,144	104%	1,210	1,201	101%	1,252	1,211	103%	1,194	1,167	102%
Central	367	348	105%	396	366	108%	415	393	106%	419	410	102%	399	379	105%
East	737	709	104%	798	767	104%	836	834	100%	849	864	98%	805	794	101%
Nelson	328	329	100%	333	341	98%	342	349	98%	359	359	100%	341	345	99%
Northld	514	505	102%	528	529	100%	545	546	100%	573	592	97%	540	543	99%
Plenty	759	760	100%	782	774	101%	827	852	97%	841	847	99%	802	808	99%
South	387	359	108%	433	388	112%	449	411	109%	468	428	109%	434	397	110%
Taran	362	331	109%	384	368	104%	412	395	104%	429	413	104%	397	377	105%
Waik	671	660	102%	707	702	101%	775	759	102%	809	791	102%	741	728	102%
Wlgn	937	851	110%	964	962	100%	1,005	1,063	95%	1,060	1,135	93%	992	1,003	99%
Total	10,186	10,020	102%	10,712	10,672	100%	11,240	11,434	98%	11,675	11,754	99%	10,953	10,970	100%

### H.1.2.2 Average AS payment per client (\$)

Region	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Auck	1,068	957	112%	1,077	952	113%	1,049	931	113%	1,053	945	111%	1,062	946	112%
Cant	692	654	106%	717	644	111%	720	642	112%	743	660	113%	718	650	110%
Central	589	633	93%	613	622	99%	593	609	97%	629	611	103%	606	619	98%
East	592	654	91%	600	643	93%	575	629	91%	592	642	92%	590	642	92%
Nelson	769	723	106%	722	704	102%	749	705	106%	742	723	103%	745	714	104%
Nor thld	623	653	95%	641	665	96%	649	666	97%	671	681	99%	646	666	97%
Plenty	714	811	88%	721	787	92%	734	756	97%	740	769	96%	727	781	93%
South	555	591	94%	593	587	101%	579	590	98%	591	598	99%	580	592	98%
Taran	570	552	103%	586	526	111%	590	530	111%	607	536	113%	588	536	110%
Waik	699	707	99%	742	700	106%	720	696	104%	733	704	104%	723	701	103%
Wlgtn	742	735	101%	746	699	107%	725	684	106%	726	694	105%	735	703	105%
Total	825	795	104%	837	784	107%	822	770	107%	833	781	107%	829	782	106%

### H.1.2.3 Total AS payments (\$m)

Region	Q1			Q2			Q3			Q4			Average across quarters		
	Actual	Expected	Ratio	Actual	Expected	Ratio									
Auck	4.3	3.9	110%	4.5	4.1	110%	4.6	4.3	108%	4.9	4.4	109%	4.6	4.2	109%
Cant	0.8	0.7	107%	0.9	0.7	116%	0.9	0.8	113%	0.9	0.8	116%	0.9	0.8	113%
Central	0.2	0.2	98%	0.2	0.2	107%	0.2	0.2	103%	0.3	0.3	105%	0.2	0.2	103%
East	0.4	0.5	94%	0.5	0.5	97%	0.5	0.5	92%	0.5	0.6	91%	0.5	0.5	93%
Nelson	0.3	0.2	106%	0.2	0.2	100%	0.3	0.2	104%	0.3	0.3	103%	0.3	0.2	103%
Northld	0.3	0.3	97%	0.3	0.4	96%	0.4	0.4	97%	0.4	0.4	95%	0.3	0.4	96%
Plenty	0.5	0.6	88%	0.6	0.6	93%	0.6	0.6	94%	0.6	0.7	96%	0.6	0.6	93%
South	0.2	0.2	101%	0.3	0.2	113%	0.3	0.2	107%	0.3	0.3	108%	0.3	0.2	107%
Taran	0.2	0.2	113%	0.2	0.2	116%	0.2	0.2	116%	0.3	0.2	118%	0.2	0.2	116%
Waik	0.5	0.5	101%	0.5	0.5	107%	0.6	0.5	106%	0.6	0.6	106%	0.5	0.5	105%
Wlgn	0.7	0.6	111%	0.7	0.7	107%	0.7	0.7	100%	0.8	0.8	98%	0.7	0.7	104%
Total	8	8	106%	9	8	107%	9	9	105%	10	9	106%	9	9	106%

# APPENDIX I CHANGE IN LIFETIME HOUSING PAYMENTS SINCE LAST PROJECTION

**Table I.1 Attribution of change from 2016 to 2017 projection by segment**

Segment		2016 current client projection					Rollforward to 2017		Change due to experience					
		2016 projection	Methodology change 1	Updated supply pipeline	Updated unemployment rate and market rents	Updated inflation and discount rates	Rollforward before discount unwind	Unwind 1 year of discounting	Difference between actual and expected cohort	Difference between rental growth in private market and public housing stock	Recognition of experience	Updated expense assumptions	2017 segment allocation	Methodology change 2
		(a)	(b)	(c)	(d)	(e)	(f) (g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
		\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
On register	Priority A	461	502	514	518	485	468	477	443	444	457	457	744	732
	Priority B and other	191	210	209	213	200	193	197	201	201	205	205	244	247
	Sub-total	652	711	723	731	685	661	674	644	645	662	662	988	979
IRRS recipients, primary aged < 65	Child in the household	2,863	2,866	2,801	2,863	2,688	2,560	2,610	2,596	2,557	2,640	2,640	2,760	2,786
	Work obligated	3,041	3,001	2,970	3,024	2,839	2,708	2,762	2,723	2,743	2,704	2,704	2,874	2,859
	Not work obligated	2,700	2,655	2,647	2,692	2,520	2,413	2,461	2,376	2,342	2,452	2,452	2,811	2,749
	NOMB	445	432	433	443	419	394	402	407	408	407	407	439	441
	No child in the household	2,660	2,609	2,599	2,611	2,473	2,334	2,380	2,370	2,385	2,357	2,357	2,680	2,684
	Work obligated	901	885	875	888	839	794	810	809	795	854	854	999	977
	Not work obligated	208	205	205	215	201	192	196	194	208	214	214	150	148
	NOMB	210	204	203	231	216	208	212	196	204	200	200	131	130
	Child in the household	664	660	655	662	615	600	612	551	584	570	570	473	465
	Work obligated	48	45	47	52	49	47	48	43	48	48	48	36	36
Not work obligated	278	282	277	300	283	269	274	259	273	261	261	185	185	
NOMB	297	311	306	303	284	275	280	242	273	260	260	220	218	
Sub-total	14,316	14,156	14,019	14,284	13,424	12,795	13,047	12,767	12,821	12,969	12,969	13,758	13,678	
IRRS recipients, primary aged 65+	Child in the household	354	345	348	352	335	312	318	312	319	340	340	363	362
	No child in the household	1,345	1,334	1,311	1,316	1,271	1,151	1,174	1,193	1,193	1,281	1,281	1,467	1,466
	Child in the household	30	33	28	33	31	30	30	28	27	26	26	18	17
	No child in the household	165	168	166	185	178	164	167	159	180	171	171	140	141
Sub-total	1,894	1,880	1,853	1,885	1,814	1,657	1,689	1,692	1,719	1,818	1,818	1,988	1,986	
Recent exit from housing	Receiving AS	326	330	326	336	313	43	43	83	81	76	76	309	304
	Not receiving AS	517	532	533	532	484	38	39	86	77	77	77	380	340
	Aged <60	13	14	13	13	12	0	0	3	3	3	3	7	8
	Aged 60+	855	877	872	880	809	81	83	172	162	157	157	696	653
Recent exit from register	Receiving AS	305	316	330	310	290	46	47	104	111	117	117	376	366
	Not receiving AS	102	109	107	102	94	13	13	32	31	28	28	114	109
	Sub-total	406	425	438	412	384	59	60	136	142	145	145	490	475
Future entries						1,350	1,377	2,274	2,293	2,171	2,171			
Total		18,124	18,049	17,906	18,193	17,117	16,603	16,931	17,684	17,782	17,921	17,921	17,921	17,770
Expenses		609	609	609	609	609	609	609	609	609	609	609	668	668
Grand total		18,733	18,658	18,515	18,802	17,726	17,212	17,540	18,294	18,391	18,530	18,589	18,589	18,439
Change			-74	-143	287	-1,076	-514	328	754	98	237	59	0	-150

**Notes:**

- (a) Estimated future lifetime housing support cost of adults in the public housing system in 2015/16 as presented in the 2016 public housing report
- (b) Isolating the change in results due to a change in methodology to better simulate the allocation of available public houses and allow for teenagers currently in a public house to age into the projection
- (c) There were 331 fewer new houses added to the overall supply compared to expected decreasing lifetime housing payments by \$0.14b
- (d) National rents increased by 4.8% compared to 2.2% assumed increasing lifetime housing payments by \$0.29b
- (e) Higher real interest rates decreasing lifetime housing payments by \$1.1b because less money has to be set aside today

- (f) The expected change due to the evolution of the system over the year
- (g) The removal of one year of discounting due to the expected timing of payments being one year closer
- (h) The size of the 30 June 2017 projection cohort is larger than expected increasing lifetime housing payments by \$0.75b. This is driven by more register applications and a higher level of re-entries into the system than expected.
- (i) The market rent of public housing increased at a rate above the private rental market over the year resulting to a further increase of \$0.1b
- (j) Updated projection assumptions increasing lifetime housing payments by \$0.24b driven by increased time in public housing for those further from the private market
- (k) Increase in the expense allowance by \$0.06b due to higher budget appropriations
- (l) Re-allocation of clients and their associated payments into segments based on their experience in 2016/17
- (m) Isolating the change in results due to the refinement of models to include additional education related predictors

## APPENDIX J SENSITIVITY ANALYSIS

### J.1 Base results

#### J.1.1 Lifetime housing support payments to current clients

Segment	IRRS payments (\$b)	AS + TAS payments (\$b)	Total payments (\$b)
In housing	14.54	1.12	15.66
Register	0.75	0.23	0.98
Recent exits	0.66	0.47	1.13
<b>Total</b>	<b>15.95</b>	<b>1.82</b>	<b>17.77</b>

### J.2 Sensitivity to inflation assumptions

#### J.2.1 Lifetime housing support payments to current clients, CPI and AWE rates 1% lower

Segment	IRRS payments (\$b)	AS + TAS payments (\$b)	Total payments (\$b)	Change on base
In housing	15.26	0.97	16.23	3.6%
Register	0.79	0.20	0.99	1.4%
Recent exits	0.68	0.42	1.10	-2.3%
<b>Total</b>	<b>16.73</b>	<b>1.60</b>	<b>18.33</b>	<b>3.1%</b>

Notes:

(a) Assumes all April inflation increases are 1% lower than those given in Appendix C

#### J.2.2 Lifetime housing support payments to current clients, CPI and AWE rates 1% higher

Segment	IRRS payments (\$b)	AS + TAS payments (\$b)	Total payments (\$b)	Change on base
In housing	13.35	1.31	14.66	-6.4%
Register	0.69	0.25	0.94	-4.2%
Recent exits	0.61	0.51	1.12	-0.6%
<b>Total</b>	<b>14.65</b>	<b>2.06</b>	<b>16.71</b>	<b>-5.9%</b>

Notes:

(a) Assumes all April inflation increases are 1% higher than those given in Appendix C

## J.3 Rental growth rate sensitivity

### J.3.1 Table of national (quarterly) rental growth used in scenarios

Quarter	National rental growth rate above CPI		
	Adopted	1% increase	1% decrease
Sep-17	0.2%	0.4%	-0.1%
Dec-17	0.2%	0.4%	-0.1%
Mar-18	0.2%	0.4%	-0.1%
Jun-18	0.2%	0.4%	-0.1%
Sep-18	0.5%	0.8%	0.3%
Dec-18	0.5%	0.8%	0.3%
Mar-19	0.5%	0.8%	0.3%
Jun-19	0.5%	0.7%	0.3%
Sep-19	0.4%	0.7%	0.2%
Dec-19	0.4%	0.7%	0.2%
Mar-20	0.4%	0.7%	0.2%
Jun-20	0.4%	0.7%	0.2%
Sep-20	0.3%	0.6%	0.1%
Dec-20	0.3%	0.6%	0.1%
Mar-21	0.3%	0.6%	0.1%
Jun-21	0.3%	0.6%	0.1%
Sep-21	0.3%	0.5%	0.1%
Dec-21	0.3%	0.5%	0.0%
Mar-22	0.3%	0.5%	0.0%
Jun-22	0.3%	0.5%	0.0%
Sep-22	0.3%	0.6%	0.1%
Dec-22	0.3%	0.6%	0.1%
Mar-23	0.3%	0.6%	0.1%
Jun-23	0.3%	0.5%	0.1%
Sep-23	0.3%	0.6%	0.1%
Dec-23	0.3%	0.6%	0.1%
Mar-24	0.3%	0.6%	0.1%
Jun-24	0.3%	0.6%	0.1%
Sep-24	0.4%	0.6%	0.1%
Dec-24	0.4%	0.6%	0.1%
Mar-25	0.3%	0.6%	0.1%
Jun-25	0.3%	0.6%	0.1%
Sep-25	0.4%	0.6%	0.1%
Dec-25	0.4%	0.6%	0.1%
Mar-26	0.4%	0.6%	0.1%
Jun-26	0.4%	0.6%	0.1%
Sep-26	0.4%	0.6%	0.1%
Dec-26	0.4%	0.6%	0.1%
Mar-27	0.4%	0.6%	0.1%
Jun-27	0.4%	0.6%	0.1%
Later	0.4%	0.6%	0.1%



### J.3.2 Lifetime housing support payments to current clients, market rents 1% lower

Segment	IRRS payments (\$b)	AS + TAS payments (\$b)	Total payments (\$b)	Change on base
In housing	11.75	1.09	12.84	-18.0%
Register	0.58	0.22	0.80	-18.1%
Recent exits	0.49	0.44	0.93	-17.4%
<b>Total</b>	<b>12.83</b>	<b>1.75</b>	<b>14.58</b>	<b>-18.0%</b>

Notes:

(a) Assumes all quarterly rental increases are 1% lower than those given in Appendix C

### J.3.3 Lifetime housing support payments to current clients, market rents 1% higher

Segment	IRRS payments (\$b)	AS + TAS payments (\$b)	Total payments (\$b)	Change on base
In housing	17.80	1.15	18.95	21.0%
Register	0.96	0.23	1.19	21.3%
Recent exits	0.88	0.48	1.36	20.9%
<b>Total</b>	<b>19.64</b>	<b>1.86</b>	<b>21.50</b>	<b>21.0%</b>

Notes:

(a) Assumes all quarterly rental increases are 1% higher than those given in Appendix C

## J.4 Unemployment rate sensitivity

### J.4.1 Lifetime housing support payments to current clients, constant unemployment rate forecast at current rate of 4.8%

Segment	IRRS payments (\$b)	AS + TAS payments (\$b)	Total payments (\$b)	Change on base
In housing	14.80	1.21	16.00	2.2%
Register	0.73	0.23	0.97	-1.4%
Recent exits	0.67	0.48	1.14	1.5%
<b>Total</b>	<b>16.20</b>	<b>1.92</b>	<b>18.11</b>	<b>1.9%</b>

Notes:

(a) The national unemployment rates for this scenario a constant 4.8%, with the regional rates adjusted accordingly

## J.5 Sensitivity to transition model assumptions

### J.5.1 Lifetime housing support payments to current clients, housing exit rates 5% higher

Segment	IRRS payments (\$b)	AS + TAS payments (\$b)	Total payments (\$b)	Change on base
In housing	14.33	1.14	15.47	-1.2%
Register	0.74	0.23	0.97	-1.2%
Recent exits	0.65	0.46	1.12	-1.1%
<b>Total</b>	<b>15.72</b>	<b>1.83</b>	<b>17.55</b>	<b>-1.2%</b>

Notes:

(a) For example, if 2% of clients transition out of housing, a 5% increase would change this to  $2.0\% \times (1+0.05) = 2.1\%$

### J.5.2 Lifetime housing support payments to current clients, housing exit rates 5% lower

Segment	IRRS payments (\$b)	AS + TAS payments (\$b)	Total payments (\$b)	Change on base
In housing	14.80	1.10	15.91	1.6%
Register	0.75	0.23	0.98	-0.2%
Recent exits	0.64	0.47	1.11	-1.8%
<b>Total</b>	<b>16.19</b>	<b>1.80</b>	<b>17.99</b>	<b>1.2%</b>

Notes:

(a) For example, if 2% of clients transition out of housing, a 5% decrease would change this to 1.9%

### J.5.3 Lifetime housing support payments to current clients, register application rates 5% higher

Segment	IRRS payments (\$b)	AS + TAS payments (\$b)	Total payments (\$b)	Change on base
In housing	14.65	1.12	15.77	0.7%
Register	0.74	0.23	0.97	-1.3%
Recent exits	0.67	0.47	1.14	1.2%
<b>Total</b>	<b>16.06</b>	<b>1.82</b>	<b>17.88</b>	<b>0.6%</b>

Notes:

(a) For example, if 3% of clients make a register application, a 5% increase would change this to 3.15%

J.5.4 Lifetime housing support payments to current clients, register application rates 5% lower

Segment	IRRS payments (\$b)	AS + TAS payments (\$b)	Total payments (\$b)	Change on base
In housing	14.43	1.13	15.56	-0.7%
Register	0.76	0.23	0.99	1.3%
Recent exits	0.65	0.47	1.11	-1.2%
<b>Total</b>	<b>15.84</b>	<b>1.82</b>	<b>17.66</b>	<b>-0.6%</b>

Notes:

(a) For example, if 3% of clients make a register application, a 5% decrease would change this to 2.85%



## APPENDIX K OTHER ONE-WAY TABLES

### K.1 Lifetime housing support payments to current clients by age

Group	Number of households	Number of adults	IRRS payments (\$m)	AS payments (\$m)	TAS payments (\$m)	Total payments (\$m)	Average payments per person (\$k)
16-19	285	24,017	311	100	15.9	427	18
20-24	2,572	19,776	899	263	45.2	1,207	61
25-29	5,298	15,070	1,379	252	46.9	1,677	111
30-34	5,756	11,597	1,490	190	38.4	1,718	148
35-39	6,081	10,663	1,629	159	35.1	1,823	171
40-44	6,748	10,954	1,760	139	33.4	1,933	176
45-49	8,189	12,563	2,087	134	34.1	2,256	180
50-54	8,310	12,333	1,998	103	26.7	2,127	172
55-59	7,273	10,571	1,538	69	17.6	1,624	154
60-64	6,196	8,711	1,115	43	10.1	1,169	134
65-75	8,743	12,070	1,235	41	8.7	1,285	106
75-85	4,338	5,900	443	10	2.1	455	77
85+	1,102	1,549	69	1	0.2	70	45
<b>All</b>	<b>70,891</b>	<b>155,774</b>	<b>15,952</b>	<b>1,504</b>	<b>315</b>	<b>17,770</b>	<b>114</b>

Notes:

- (a) Number of households shows the number of households by group of the primary householder
- (b) Number of households excludes recent housing or register exits.

### K.2 Lifetime housing support payments to current clients by duration in current housing state

Group	Number of households	Number of adults	IRRS payments (\$m)	AS payments (\$m)	TAS payments (\$m)	Total payments (\$m)	Average payments per person (\$k)
<1yr	7,753	38,814	1,962	468	93.2	2,524	65
1-2 yr	5,635	14,551	1,233	201	40.7	1,475	101
2-3 yr	4,433	8,392	956	119	25.0	1,100	131
3-4 yr	4,464	7,987	985	101	21.4	1,106	139
4-5 yr	3,461	6,920	818	77	16.5	912	132
5-6 yr	2,979	5,913	707	65	13.8	785	133
6-7 yr	2,827	5,515	657	51	11.1	719	130
7-8 yr	3,051	5,590	695	48	10.3	753	135
8-9 yr	2,880	5,137	652	45	9.7	706	137
9-10 yr	2,630	4,671	625	38	8.4	671	144
10-15 yr	11,360	20,531	2,673	138	30.5	2,842	138
15-20 yr	18,653	27,702	3,816	119	27.8	3,962	143
20-25 yr	392	2,291	83	23	4.4	111	48
25+ yr	373	1,760	92	11	1.9	105	60
<b>All</b>	<b>70,891</b>	<b>155,774</b>	<b>15,952</b>	<b>1,504</b>	<b>315</b>	<b>17,770</b>	<b>114</b>

Notes:

- (a) Number of households shows the number of households by group of the primary householder
- (b) Number of households excludes recent housing or register exits.

### K.3 Lifetime housing support payments to current clients by cumulative time in public housing

Group	Number of households	Number of adults	IRRS payments (\$m)	AS payments (\$m)	TAS payments (\$m)	Total payments (\$m)	Average payments per person (\$k)
<1yr	6,246	19,566	1,090	320	64	1,473	75
1-2 yr	3,209	10,627	734	126	25	885	83
2-3 yr	3,207	8,098	738	99	21	857	106
3-4 yr	3,328	6,801	732	84	18	834	123
4-5 yr	3,276	6,807	761	78	17	855	126
5-6 yr	2,900	6,230	676	70	15	762	122
6-7 yr	3,018	6,289	707	66	14	787	125
7-8 yr	3,157	6,327	739	64	14	816	129
8-9 yr	3,211	6,566	757	62	13	832	127
9-10 yr	3,159	6,199	758	59	13	829	134
10-15 yr	14,289	29,713	3,496	240	51	3,787	127
15-20 yr	20,832	35,685	4,435	178	39	4,653	130
20-25 yr	502	3,798	169	34	6	208	55
25+ yr	557	3,068	161	25	4	190	62
<b>All</b>	<b>70,891</b>	<b>155,774</b>	<b>15,952</b>	<b>1,504</b>	<b>315</b>	<b>17,770</b>	<b>114</b>

Notes:

- (a) Number of households shows the number of households by group of the primary householder
- (b) Number of households excludes recent housing or register exits.

### K.4 Lifetime housing support payments to current clients by region

Group	Number of households	Number of adults	IRRS payments (\$m)	AS payments (\$m)	TAS payments (\$m)	Total payments (\$m)	Average payments per person (\$k)
Northland	2,248	4,679	330	63	14	406	87
Waikato	4,277	8,839	729	101	23	853	97
East Coast	3,295	7,156	555	94	17	665	93
Bay of Plenty	4,399	8,557	624	101	21	746	87
Taranaki	2,017	3,784	216	46	11	272	72
Central	2,335	4,584	287	59	12	358	78
Wellington	8,780	17,577	1,621	158	32	1,811	103
Nelson	1,663	3,085	238	42	9	289	94
Canterbury	6,970	13,219	1,263	128	34	1,425	108
Southern	2,535	4,457	322	52	12	386	87
Auckland	32,372	79,837	9,768	662	129	10,559	132
<b>All</b>	<b>70,891</b>	<b>155,774</b>	<b>15,952</b>	<b>1,504</b>	<b>315</b>	<b>17,770</b>	<b>114</b>

Notes:

- (a) Number of households excludes recent housing or register exits.



## K.5 Lifetime housing support payments to current clients by local board (Auckland only)

Group	Number of households	Number of adults	IRRS payments (\$m)	AS payments (\$m)	TAS payments (\$m)	Total payments (\$m)	Average payments per person (\$k)
Albert-Eden	1,737	3,673	521	29	6	556	151
Devonport-Takapuna	283	548	100	6	1	107	196
Franklin	375	867	100	11	2	113	130
Henderson-Massey	2,807	7,461	865	70	14	949	127
Hibiscus and Bays	157	355	37	6	1	44	124
Howick	598	1,677	200	12	2	215	128
Kaipatiki	1,016	2,368	297	22	4	324	137
Mangere-Otahuhu	4,490	13,430	1,436	93	17	1,547	115
Manurewa	3,332	8,837	1,047	82	16	1,144	129
Maungakiekie-Tamaki	4,895	11,134	1,528	79	15	1,622	146
Orakei	805	1,518	228	11	2	241	159
Otara-Papatoetoe	3,663	9,721	1,057	74	14	1,145	118
Papakura	1,481	3,670	446	42	8	497	135
Puketapapa	2,475	5,788	778	40	8	826	143
Rodney	78	208	18	4	1	22	107
Upper Harbour	57	122	13	2	0	15	124
Waiheke	19	27	2	0	0	3	103
Waitakere Ranges	563	1,480	174	16	3	194	131
Waitemata	1,485	2,269	372	24	5	401	177
Whau	2,056	4,684	547	39	8	594	127
<b>All</b>	<b>32,372</b>	<b>79,837</b>	<b>9,768</b>	<b>662</b>	<b>129</b>	<b>10,559</b>	<b>132</b>

Notes:

(a) Number of households excludes recent housing or register exits.

## K.6 Lifetime housing support payments to current clients by ethnicity

Group	Number of households	Number of adults	IRRS payments (\$m)	AS payments (\$m)	TAS payments (\$m)	Total payments (\$m)	Average payments per person (\$k)
NZ EU	17,809	30,775	2,957	325	80	3,362	109
Māori	26,226	55,874	5,498	703	145	6,346	114
Pacific	17,035	45,772	5,147	280	52	5,479	120
Asian	3,771	9,514	1,018	83	11	1,113	117
Other	6,050	13,839	1,332	113	26	1,470	106
<b>All</b>	<b>70,891</b>	<b>155,774</b>	<b>15,952</b>	<b>1,504</b>	<b>315</b>	<b>17,770</b>	<b>114</b>

Notes:

(a) Number of households shows the number of households by group of the primary householder

(b) Number of households excludes recent housing or register exits.

## K.7 Lifetime housing support payments to current clients by household size, current households

Group	Number of households	Number of adults	IRRS payments (\$m)	AS payments (\$m)	TAS payments (\$m)	Total payments (\$m)	Average payments per person (\$k)
1	19,905	19,905	3,015	118	31	3,164	159
2	13,728	22,642	2,698	192	43	2,934	130
3	10,134	20,143	2,505	186	39	2,729	135
4	8,170	18,567	2,250	162	33	2,444	132
5	5,595	14,621	1,671	113	22	1,806	124
6	3,380	10,164	1,129	70	14	1,213	119
7+	3,504	12,944	1,273	85	16	1,373	106
<b>All</b>	<b>64,416</b>	<b>118,986</b>	<b>14,540</b>	<b>926</b>	<b>198</b>	<b>15,663</b>	<b>132</b>

Notes:

(a) Excludes recent exits from public housing or the register.

## K.8 Lifetime housing support payments to current clients by benefit type

Group	Number of households	Number of adults	IRRS payments (\$m)	AS payments (\$m)	TAS payments (\$m)	Total payments (\$m)	Average payments per person (\$k)
SLP-Carer	1,587	2,510	514	39	8	561	223
SPS	11,842	15,218	3,067	362	73	3,502	230
JS-HCD	7,159	10,714	1,802	172	41	2,015	188
SLP-HCD	12,085	17,467	2,534	237	58	2,830	162
JS-WR	6,125	11,453	1,479	205	42	1,726	151
OB	330	435	75	4	1	79	182
SUP	1,615	3,327	372	48	8	428	129
EB	145	266	36	3	1	40	150
NZ Super	14,140	19,362	1,741	51	11	1,803	93
NOB	15,863	75,022	4,333	382	71	4,786	64
<b>All</b>	<b>70,891</b>	<b>155,774</b>	<b>15,952</b>	<b>1,504</b>	<b>315</b>	<b>17,770</b>	<b>114</b>

Notes:

(a) Number of households shows the number of households by group of the primary householder  
 (b) Number of households excludes recent housing or register exits.

## APPENDIX L    PROJECTED NUMBER OF CLIENTS AND PAYMENTS

---

Projected numbers and payments are included as an electronic Appendix L.

