



## **Central Forecasting and Modelling Unit**

# **National School Roll Projections July 2006 update**

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## Introduction

This report describes the latest forecast of the number of students<sup>1</sup> enrolled in New Zealand's schools. Forecasts described here support the forecasting of expenditure on teachers' salaries, schools' operations grants, and student allowances, as part of the Government's five-year budget forecasts. The forecast rolls are snapshots; they project primary year-levels as at 1 July and secondary year-levels as at 1 March.

In this update, the 1 July 2006 roll survey forms the new base for the primary level forecast, and the 1 March 2006 roll survey forms the new base for the secondary level forecast. The roll driver assumptions have been revised due to new birth and migration information from Statistics New Zealand (SNZ).

This report is in two parts:

1. Results of the latest national school roll projections (July 2006 update).
2. A detailed breakdown of the major changes between the current forecast and the previous forecast. This section includes a brief description of the methodology used in this forecast.

A more detailed report on the methodology used in the National School Roll Projections is also available on request.

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<sup>1</sup> Note that this discussion excludes special school students. Special school students are forecast as a proportion of rolls at regular schools. However, the appendix tables include special school students; hence there is a difference between totals in the text and totals in the appendices.

# PART 1: Results from the National School Roll Projections

The forecast results are based on the medium projection of a series of four roll projections: low, medium-low, medium, and high. At the time of calculation, all the projections are considered possible in that the roll levels predicted by each will occur if their respective assumptions (rates of migration, births, senior school retention, etc.) become true. While the medium forecast is the projection that the Ministry considers to be the most likely to occur, consideration should be given to the possibility of the high and low projections eventuating.

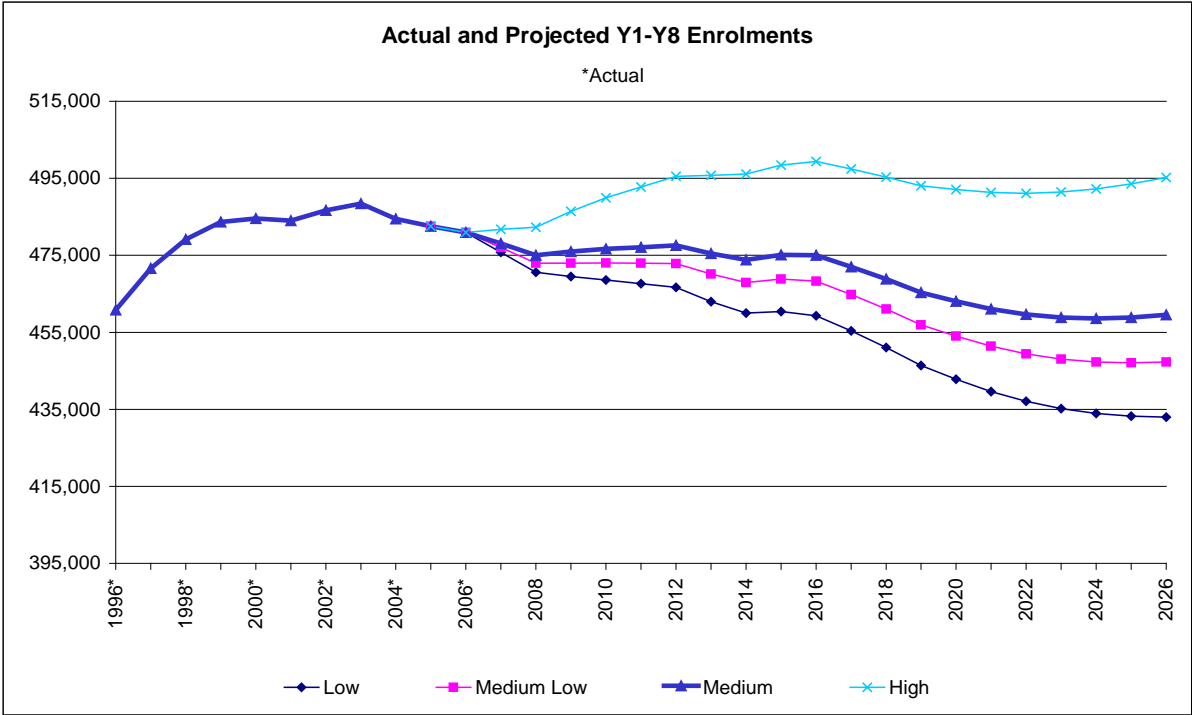
The roll projections are of regular students in Year 1 to Year 15. These include adult students but exclude foreign fee paying students (FFPs) and students on a scholarship from the New Zealand Agency for International Development (NZAID). Special school students are forecast separately.

## Primary enrolments

Primary level enrolments (Year 1 to Year 8) peaked in 2003 (see Figure 1). In 2006, there were around 479,300 primary level enrolments – around 1,500 (or 0.4 percent) fewer than in 2005.

The single most important driver in the primary level forecast is the number of children born in a given year and their entrance into the school system five years later. Since 2003 there has been a notable increase in the number of births. This increase is expected to boost primary rolls in 2009 and eventually impact on secondary rolls in later years. The current set of SNZ birth projections forecast a decline in births from 2006 on.

Figure 1: Actual and projected Year 1 to Year 8 enrolments, 1996 to 2026



\*Actual

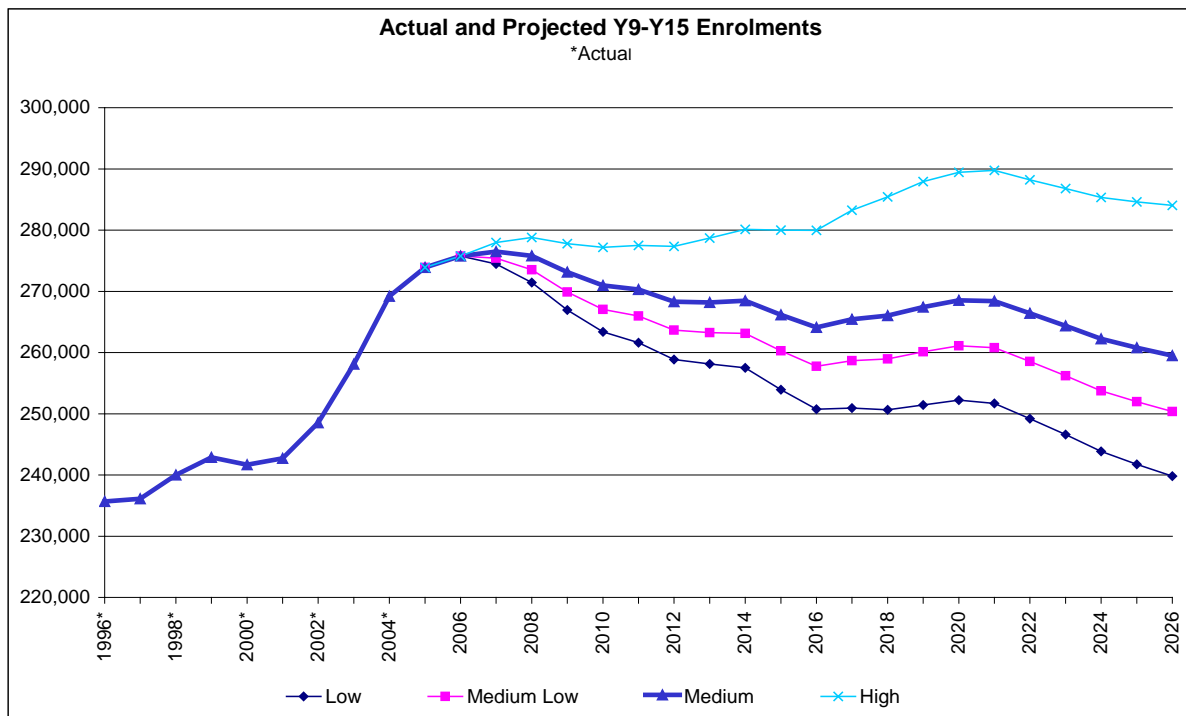
## Secondary enrolments

Secondary level enrolments (Year 9 to Year 15) have shown large increases since 2001 (see Figure 2). In 2006, there were around 274,200 secondary level enrolments – around 1,900 (or 0.7 percent) more than in 2005.

The forecast period captures the primary bulge that resulted from the large increase in births from the mid-1980s until 1992. This bulge started flowing into secondary schools in 1999, bringing about increases in secondary school rolls. This bulge continues to push secondary rolls well in excess of previous levels. Secondary rolls are expected to peak in 2007 at around 274,500 enrolments.

The forecast period also captures the increase in birth cohorts since 2003, which will leave primary school around 2016 and enter secondary school in 2017.

**Figure 2: Actual and projected Year 9 to Year 15 enrolments, 1996 to 2026**



\*Actual

## **PART 2: Changes in assumptions**

The National School Roll Projections are updated following the release of the March and July roll survey results. The March roll survey data is used to update Year 9 to Year 15 projections, and the July roll survey data is used to update the Year 1 to Year 8 projections.

The previous forecast was completed in September 2005 and is referred to as the *July 2005 update*<sup>2</sup>. The current forecast incorporates the July 2006 Year 1 to Year 8 roll survey data and the March 2006 Year 9 to Year 15 roll survey data, as well as the latest actual migration data. This current forecast is referred to as the *July 2006 update*.

### ***Main drivers***

Birth data provided by SNZ is the most important factor in determining the number of children at school age. Children born in any one year enter school five years later, and then proceed through primary and secondary schooling in subsequent years.

Migration projections are also provided by SNZ and are another important factor in the roll projections. The current roll projections use SNZ's official long-term population projections for both the age profile of migrants and the projected number of births as mentioned above.

### ***Methodology***

This forecast uses the results from the roll surveys of July 2006 and March 2006 for Year 1 to Year 8 rolls and Year 9 to Year 15 rolls respectively as its base. From this base we use a cohort component methodology to produce the school roll projections out to the year 2026. The projections are snapshot projections – they project primary year-levels as at 1 July and secondary year-levels as at 1 March.

The main drivers used in this projection are:

1. number of actual and projected births;
2. progression rates of students from one school year-level to the next, between calendar years. These are also called retention rates in secondary Years 12 to 15; and
3. the number of actual and projected permanent and long-term (PLT) migrants arriving/leaving NZ.

The number of special school and home-schooled students is also forecast. The regular school roll forecast is adjusted to reflect roll movement to and from these sectors. Please refer to appendices 2 and 3 for the special school and home-school roll forecast.

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<sup>2</sup> The July 2005 update used the results from the roll surveys of July 2005 and March 2005 for Year 1 to Year 8 and Year 9 to Year 15 respectively as its base.

## **Baseline update: school enrolments**

The current Year 1 to Year 8 and Year 9 to 15 forecast baseline has been updated with the actual rolls from the 1 July 2006 and the 1 March 2006 roll collections. Inclusion of the actuals allows us to:

1. update the primary and secondary level roll base for 2006 on which the projections for the out-years are based;
2. analyse the accuracy of the previous forecast; and
3. evaluate the assumptions (migration, retention, and births) that were previously used and make appropriate revisions for the current forecast.

Actual results from the 1 July 2006 roll survey indicate that the previous forecast of students in primary year-levels was too high by 200 students, or 0.05 percent. The number of Year 1 to Year 8 students attending NZ schools decreased by around 1,500 regular students, or 0.3 percent, between July 2005 and July 2006.

Actual results from the 1 March 2006 roll survey indicate that the previous forecast of students in secondary year-levels was too high by 300 students, or 0.1 percent. The number of Year 9 to Year 15 students attending NZ schools decreased by around 1,600 regular students, or 0.6 percent, between March 2005 and March 2006.

## **Assumption changes to migration**

Net PLT migration (the difference between migrant arrivals and departures) is the most difficult driver to predict. The roll projection model assumes net migration in 1 July to 30 June years.

The net PLT migration assumptions used in this forecast, as with the previous forecast, come from SNZ's projections (July 2006). For 2007 onwards the assumptions have been changed to reflect the lower than expected level of school-aged migrants experienced in 2006.

**Table 1: Net permanent and long-term migration of school-aged children (0 to 17 years)**

<b>Year</b>	<b>Current Forecast (0 to 17 year olds)</b>	<b>Previous Forecast (0 to 17 year olds)</b>	<b>Net Change (0 to 17 year olds)</b>
2006	3,200*	3,900	-700
2007	3,600	5,300	-1,700
2008	3,800	5,900	-2,100
2009	3,600	6,600	-3,000
2010	3,300	6,600	-3,300
2011 onwards	3,200	6,600	-3,400

\* Actual migration

Net PLT migration statistics give us a starting point for estimating the number of migrants in schools, as they include all children intending to enter/leave New Zealand for a period of 12 months or more. It is important to note however that the number of net PLT school-aged migrants does not translate directly to the number of extra children in schools.

In the roll projections, estimates are made of the number of PLT migrants who will enrol in NZ schools by year level. Table 3 summarises the number of PLT migrants expected to enter NZ schools in coming years.

**Table 2: Number of migrant students expected to enter primary and secondary level schooling**

Year	Primary**			Secondary		
	Current forecast	Previous Forecast	Net Change	Current forecast	Previous Forecast	Net Change
2006	2,900*	3,000	-100	1,200	1,400	-200
2007	3,400	3,700	-300	1,400	1,700	-300
2008	3,300	3,900	-600	1,400	1,800	-400
2009	3,000	3,900	-900	1,400	2,000	-600
2010	2,500	3,900	-1,400	1,300	2,000	-700
2011 onwards	2,400	3,900	-1,500	1,200	2,000	-800

\*Estimated actual

\*\* Primary totals include 0 to 4 year old migrants who arrived in NZ in the last four years and will be turning 5 years old in the projected year.

### Assumption changes to progression rates

Enrolment projections use progression rates to estimate how many students at a given year-level will progress to the next year-level the following year. A progression rate is derived by analysing historical, gender-specific trends in enrolments for each year-level, and is adjusted to exclude the effects of net migration.

These progression rates are assumed constant throughout the projection period<sup>3</sup>. They are first applied to the most recent actual roll data to estimate the number of students that will enter each year-level in the following year, and then reapplied to this result to estimate the number of students in subsequent years.

Between the previous forecast and the current one, progression rates have been changed to reflect changes in actual roll data. Primary level progression rates increased for Year 1 and Year 2 students. Secondary level progression rates have generally decreased (Table 3).

**Table 3: Progression rates in the current forecast vs. previous forecast**

	Current Forecast		Previous Forecast	
	Male	Female	Male	Female
Birth to Year 1	1.0036	1.0096	1.0035	1.0049
Year 1 to Year 2	0.9853	0.9914	0.9806	0.9840
Year 2 to Year 3	0.9990	0.9986	1.0010	1.0007
Year 3 to Year 4	0.9983	0.9977	1.0022	1.0020
Year 4 to Year 5	0.9999	0.9971	1.0003	1.0014
Year 5 to Year 6	0.9894	0.9906	0.9918	0.9897
Year 6 to Year 7	1.1695	1.1546	1.1707	1.1542
Year 7 to Year 8	0.8789	0.8869	0.8767	0.8911
Year 8 to Year 9	0.9986	0.9954	1.0014	0.9971
Year 9 to Year 10	0.9906	1.0006	0.9860	0.9969
Year 10 to Year 11	0.9650	0.9846	0.9658	0.9830
Year 11 to Year 12	0.8015	0.8621	0.8081	0.8633
Year 12 to Year 13	0.7099	0.7752	0.7106	0.7548
Year 13 to Year 14	0.0304	0.0289	0.0282	0.0261
Year 14 to Year 15	0.1609	0.2602	0.1373	0.2253

<sup>3</sup> With the exception of Year 12 and Year 13 which have non-static progression rates applied to the first five years of the projection period.

## **APPENDIX**

- A1 Summaries of primary-level, secondary level and total student rolls
- A2 Forecast special school rolls
- A3 Forecast home-schooling rolls



## APPENDIX ONE

**Table 1: Actual and projected number of students in Year 1 to Year 8, 1996 to 2026**

Actual and Projected Roll					Index of Growth Medium 2006 Base	Change from Previous Year				
Year	Low	Medium Low	Medium	High		Year	Low	Medium Low	Medium	High
1996*			460,800		0.96	1996*				
1997*			471,600		0.98	1997*			10,800	
1998*			479,100		1.00	1998*			7,500	
1999*			483,700		1.01	1999*			4,600	
2000*			484,600		1.01	2000*			900	
2001*			484,000		1.01	2001*			-600	
2002*			486,700		1.01	2002*			2,700	
2003*			488,500		1.02	2003*			1,800	
2004*			484,500		1.01	2004*			-4,000	
2005*			482,600		1.00	2005*			-1,900	
2006*	481,000	481,000	481,000	481,000	1.00	2006*	-1,600	-1,600	-1,600	-1,600
2007	475,800	477,000	478,100	481,700	0.99	2007	-5,200	-4,000	-2,900	700
2008	470,600	473,000	475,000	482,300	0.99	2008	-5,200	-4,000	-3,100	600
2009	469,500	473,000	475,900	486,400	0.99	2009	-1,100	0	900	4,100
2010	468,600	473,000	476,700	489,900	0.99	2010	-900	0	800	3,500
2011	467,700	473,000	477,100	492,800	0.99	2011	-900	0	400	2,900
2012	466,700	472,900	477,600	495,500	0.99	2012	-1,000	-100	500	2,700
2013	463,000	470,100	475,500	495,700	0.99	2013	-3,700	-2,800	-2,100	200
2014	460,000	468,000	473,800	496,100	0.99	2014	-3,000	-2,100	-1,700	400
2015	460,400	468,800	475,100	498,400	0.99	2015	400	800	1,300	2,300
2016	459,300	468,300	475,000	499,400	0.99	2016	-1,100	-500	-100	1,000
2017	455,400	464,800	472,000	497,400	0.98	2017	-3,900	-3,500	-3,000	-2,000
2018	451,100	461,000	468,800	495,300	0.97	2018	-4,300	-3,800	-3,200	-2,100
2019	446,400	456,900	465,300	493,100	0.97	2019	-4,700	-4,100	-3,500	-2,200
2020	442,800	454,000	463,100	492,100	0.96	2020	-3,600	-2,900	-2,200	-1,000
2021	439,600	451,400	461,000	491,300	0.96	2021	-3,200	-2,600	-2,100	-800
2022	437,100	449,400	459,600	491,100	0.96	2022	-2,500	-2,000	-1,400	-200
2023	435,200	448,100	458,800	491,400	0.95	2023	-1,900	-1,300	-800	300
2024	433,900	447,300	458,600	492,300	0.95	2024	-1,300	-800	-200	900
2025	433,200	447,100	458,900	493,600	0.95	2025	-700	-200	300	1,300
2026	433,000	447,300	459,500	495,200	0.96	2026	-200	200	600	1,600

\* Actual

Note 1: The total figures may differ from other total figures due to rounding and inclusion of special schools.

Note 2: Actuals and projections are as at 1 July each year, and do not include weighting on the new entrant roll. Where census date is not 1 July, the new entrant roll has been adjusted accordingly.

Note 3: Includes special school students hence double counting of hospital and health camp students has occurred.

**Table 2: Actual and projected number of students in Year 9 to Year 15, 1996 to 2026**

Actual and Projected Roll					Index of Growth Medium 2006 Base	Change from Previous Year				
Year	Low	Medium Low	Medium	High		Year	Low	Medium Low	Medium	High
1996*			235,700		0.85	1996*				
1997*			236,100		0.86	1997*			400	
1998*			240,000		0.87	1998*			3,900	
1999*			242,900		0.88	1999*			2,900	
2000*			241,700		0.88	2000*			-1,200	
2001*			242,700		0.88	2001*			1,000	
2002*			248,500		0.90	2002*			5,800	
2003*			258,100		0.94	2003*			9,600	
2004*			269,200		0.98	2004*			11,100	
2005*	273,900	273,900	273,900	273,900	0.99	2005*			4,700	
2006*	275,800	275,800	275,800	275,800	1.00	2006*	1,900	1,900	1,900	1,900
2007	274,500	275,400	276,500	278,000	1.00	2007	-1,300	-400	700	2,200
2008	271,400	273,500	275,800	278,800	1.00	2008	-3,100	-1,900	-700	800
2009	267,000	269,900	273,100	277,800	0.99	2009	-4,400	-3,600	-2,700	-1,000
2010	263,400	267,100	271,000	277,200	0.98	2010	-3,600	-2,800	-2,100	-600
2011	261,600	266,000	270,300	277,500	0.98	2011	-1,800	-1,100	-700	300
2012	258,900	263,700	268,300	277,300	0.97	2012	-2,700	-2,300	-2,000	-200
2013	258,100	263,300	268,200	278,700	0.97	2013	-800	-400	-100	1,400
2014	257,500	263,100	268,500	280,100	0.97	2014	-600	-200	300	1,400
2015	253,900	260,300	266,100	280,000	0.96	2015	-3,600	-2,800	-2,400	-100
2016	250,700	257,800	264,100	280,000	0.96	2016	-3,200	-2,500	-2,000	0
2017	250,900	258,700	265,400	283,300	0.96	2017	200	900	1,300	3,300
2018	250,600	259,000	266,000	285,400	0.96	2018	-300	300	600	2,100
2019	251,400	260,100	267,400	287,900	0.97	2019	800	1,100	1,400	2,500
2020	252,200	261,100	268,500	289,500	0.97	2020	800	1,000	1,100	1,600
2021	251,700	260,800	268,400	289,800	0.97	2021	-500	-300	-100	300
2022	249,200	258,500	266,400	288,200	0.97	2022	-2,500	-2,300	-2,000	-1,600
2023	246,600	256,200	264,400	286,800	0.96	2023	-2,600	-2,300	-2,000	-1,400
2024	243,800	253,800	262,200	285,300	0.95	2024	-2,800	-2,400	-2,200	-1,500
2025	241,700	252,000	260,800	284,600	0.95	2025	-2,100	-1,800	-1,400	-700
2026	239,800	250,400	259,500	284,000	0.94	2026	-1,900	-1,600	-1,300	-600

\* Actual

Note 1: The total figures may differ from other total figures due to rounding and inclusion of special schools.

Note 2: Actuals and projections are as at 1 July each year.

Note 3: Includes special school students hence double counting of hospital and health camp students has occurred.

**Table 3: Actual and projected number of students in Year 1 to Year 15, 1996 to 2026**

Actual and Projected Roll					Index of Growth Medium 2006 Base	Change from Previous Year				
Year	Low	Medium Low	Medium	High		Year	Low	Medium Low	Medium	High
1996*			696,500		0.92	1996*				
1997*			707,700		0.94	1997*			11,200	
1998*			719,100		0.95	1998*			11,400	
1999*			726,500		0.96	1999*			7,400	
2000*			726,300		0.96	2000*			-200	
2001*			726,700		0.96	2001*			400	
2002*			735,200		0.97	2002*			8,500	
2003*			746,600		0.99	2003*			11,400	
2004*			753,700		1.00	2004*			7,100	
2005*			756,500		1.00	2005*			2,800	
2006*	756,700	756,700	756,700	756,700	1.00	2006	200	200	200	200
2007	750,300	752,400	754,600	759,700	1.00	2007	-6,400	-4,300	-2,100	3,000
2008	742,000	746,500	750,800	761,100	0.99	2008	-8,300	-5,900	-3,800	1,400
2009	736,500	742,900	749,100	764,200	0.99	2009	-5,500	-3,600	-1,700	3,100
2010	731,900	740,100	747,600	767,100	0.99	2010	-4,600	-2,800	-1,500	2,900
2011	729,300	738,900	747,400	770,300	0.99	2011	-2,600	-1,200	-200	3,200
2012	725,500	736,500	745,900	772,800	0.99	2012	-3,800	-2,400	-1,500	2,500
2013	721,100	733,400	743,600	774,400	0.98	2013	-4,400	-3,100	-2,300	1,600
2014	717,500	731,100	742,300	776,300	0.98	2014	-3,600	-2,300	-1,300	1,900
2015	714,300	729,100	741,200	778,400	0.98	2015	-3,200	-2,000	-1,100	2,100
2016	710,000	726,000	739,100	779,300	0.98	2016	-4,300	-3,100	-2,100	900
2017	706,300	723,500	737,500	780,700	0.97	2017	-3,700	-2,500	-1,600	1,400
2018	701,700	720,000	734,900	780,700	0.97	2018	-4,600	-3,500	-2,600	0
2019	697,800	717,100	732,800	781,000	0.97	2019	-3,900	-2,900	-2,100	300
2020	695,000	715,100	731,600	781,500	0.97	2020	-2,800	-2,000	-1,200	500
2021	691,300	712,200	729,500	781,100	0.96	2021	-3,700	-2,900	-2,100	-400
2022	686,300	707,900	726,100	779,300	0.96	2022	-5,000	-4,300	-3,400	-1,800
2023	681,800	704,300	723,200	778,200	0.96	2023	-4,500	-3,600	-2,900	-1,100
2024	677,800	701,100	720,800	777,600	0.95	2024	-4,000	-3,200	-2,400	-600
2025	674,900	699,000	719,700	778,200	0.95	2025	-2,900	-2,100	-1,100	600
2026	672,800	697,600	719,000	779,200	0.95	2026	-2,100	-1,400	-700	1,000

\* Actual

Note 1: The total figures may differ from other total figures due to rounding and inclusion of special schools.

Note 2: Actuals and projections are as at 1 July each year, and do not include weighting on the new entrant roll. Where census date is not 1 July, the new entrant roll has been adjusted accordingly.

Note 3: Includes special school students hence double counting of hospital and health camp students has occurred.

## APPENDIX TWO

**Table 1: Actual and forecast special school students**

Year	Special School Students		
	Male	Female	Total
1996*	1,537	954	2,491
1997*	1,550	954	2,504
1998*	1,537	954	2,491
1999*	1,521	878	2,399
2000*	1,782	1,095	2,877
2001*	1,883	1,145	3,028
2002*	1,908	1,126	3,034
2003*	1,967	1,180	3,147
2004*	2,030	1,183	3,213
2005*	2,120	1,254	3,374
2006*	2,004	1,202	3,206
2007	1,996	1,199	3,195
2008	1,987	1,194	3,181
2009	1,984	1,193	3,176
2010	1,980	1,192	3,172
2011	1,980	1,193	3,174
2012	1,977	1,193	3,169
2013	1,972	1,190	3,162
2014	1,970	1,189	3,159
2015	1,969	1,188	3,157
2016	1,965	1,186	3,151
2017	1,962	1,184	3,146
2018	1,958	1,180	3,138
2019	1,955	1,177	3,132
2020	1,955	1,176	3,130
2021	1,951	1,173	3,124
2022	1,945	1,168	3,112
2023	1,939	1,164	3,103
2024	1,935	1,160	3,096
2025	1,934	1,159	3,093
2026	1,935	1,159	3,093

\* Actual

Note: Special school rolls are as at 1 July.

## APPENDIX THREE

**Table 1: Actual and forecast home-schooling rolls**

Year	Number in Home Schooling		
	Primary	Secondary	Total
1996*	3,383	1,768	5,151
1997*	3,374	1,977	5,351
1998*	3,513	1,761	5,274
1999*	3,645	1,806	5,451
2000*	3,975	1,902	5,877
2001*	3,954	2,022	5,976
2002*	4,118	2,055	6,173
2003*	4,285	2,152	6,437
2004*	4,315	2,191	6,506
2005*	4,371	2,057	6,428
2006*	4,245	2,053	6,298
2007	4,216	2,056	6,271
2008	4,189	2,050	6,239
2009	4,197	2,030	6,228
2010	4,204	2,014	6,218
2011	4,207	2,009	6,216
2012	4,212	1,994	6,206
2013	4,193	1,994	6,186
2014	4,178	1,996	6,174
2015	4,190	1,978	6,168
2016	4,189	1,963	6,152
2017	4,162	1,973	6,136
2018	4,134	1,978	6,112
2019	4,103	1,988	6,091
2020	4,083	1,996	6,080
2021	4,065	1,995	6,061
2022	4,053	1,980	6,033
2023	4,046	1,965	6,011
2024	4,044	1,949	5,993
2025	4,046	1,938	5,985
2026	4,052	1,929	5,981

\* Actual

Note: Home-schooling rolls are as at 1 July.