Brighton and Hove City Council: Pupil Number Forecasting System

A report on the

methodology and accuracy

of the pupil number forecasting

system used by

Brighton and Hove City Council

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Please note: some graphs and tables in the report are colour coded

It is recommended that the report is viewed on screen or printed in colour.

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Brighton and Hove City Council: Pupil Number Forecasting System

Introduction: the assignment

Brighton and Hove City Council commissioned an independent review into the methodology and accuracy of its pupils forecasting system.

The Council's Head of Education Planning and Contracts, the Head of Education Capital and the Senior Admissions Officer met with me on Tuesday 21st July to explain the characteristics of school organisation in the City, including geographical and social factors, the pupil forecasting system used, and the questions they wished the review to address. The system was demonstrated and copies of the Excel spreadsheets used were subsequently provided for analysis.   On 20th August I had a telephone conversation with the Executive Director of Children's Services. These conversations highlighted that there had been a recent change of political leadership in the Council and a significant number of newly elected councillors. Decisions on major school organisational changes were likely to be required over the next year in response to forecast growing demand for secondary school places. In this context it was felt useful to have an independent review of the pupils forecasting system.   This would encompass the methodology used and the accuracy of the forecast.

Copies of the "forecast workbook" spreadsheets were provided, other working documents analysing the rate of transfer between the primary and secondary phases, along with a current admissions handbook and map of the city, DfE school capacity returns and the two most recent School Organisation Plans.   These have been analysed and the results presented in this report.

In brief, the methodology currently used provides a good short term (three year) forecast for citywide primary numbers, particularly for the number of Year R (4+) pupils expected to be admitted.   The methodology used is less accurate for secondary forecasts, but improving as a result of recent changes to the approach.

The forecasts provided indicate the expected level of demand across the city, and to some extent within smaller planning areas, however no school level forecasts are produced within the system: the forecasts focus on where demand will arise, not where or how it will be met. Officers explained that the forecasts are used as a starting point for making decisions about how and where increased demand would be met. The principal advantage of the methodology chosen is its simplicity and its cost effectiveness – being operated by relatively senior officers alongside their wider responsibilities, using well understood generic software, without the need for specialist staff, specialist software or external partners.

Methodology

This section briefly describes the methodology used. Appendix A gives a more detailed description of the approach used in each of the forecasts analysed.

It was explained that some years ago as a consequence of budgetary constraints Brighton and Hove Council closed its in-house demography service which had previously managed school number forecasting. This task then fell to staff working within Children's Services with responsibility for planning and delivering school buildings. This included providing the data for Department for Education annual school capacity returns, for the School Organisation Plan, and for any internal management purposes – such as coordinating school admissions, and informing school organisation decision making. The staff within the Directorate had to develop a workable system that provided the required data, within the constraints of available time and resources. Over the period examined the forecasting system has been developed and improved. The more recent forecasts provide a higher level of one year accuracy than previously.

I have looked at three main types of forecast documentation supplied by Brighton and Hove – "forecast workbooks", School Organisation Plans, and DfE School Capacity (SCAP) returns.

1. "Forecast workbooks" are Excel spreadsheets that are essentially the internal working documents in which the GP registration source data is converted into pupil number forecasts. These have evolved over the years, and are the core of the forecasting system. They are not intended for publication, and have not always been presented in a way conducive to ready understanding – for example cells are not always clearly labelled. However they perform the basic function required – to indicate likely future demand for school places. The "forecast workbooks" are working drafts for the more formally published forecasts. Sometimes the "forecast workbooks" are looked at by senior decision makers to assist in operational decision making – for example consideration whether to create a "bulge year" at a school in response to short term local demand, as well as considering longer term strategic challenges.

2. A School Organisation (SOP) was at one time a statutory requirement of all local education authorities. This is no longer the case, but many still produce one (or an equivalent). Two have been produced in recent years by Brighton and Hove City Council – one for 2012 to 2016 and one for 2013 to 2017. These set out the strategic background for school place planning in the city and include forecasts for the primary and secondary sectors. They include an introduction by the Executive Director and were discussed and formally approved by the Council. They are readily available on the Council website. The forecasts are simply data extracts from the "forecast workbooks", with interpretive text and conclusions. The School Organisation Plan forecasts are "on the record" and thus can be scrutinised by the public.

3. DfE School Capacity (SCAP) returns have been required by the government for some years, and have become increasingly detailed in the data required. This includes number on roll for all schools, the capacity of all schools and

forecast of future numbers. One of the principal purposes of these returns is to target and prioritise central government capital investment in school buildings. It is a requirement of the return that it is signed off by the statutory Director. Whilst not necessarily "published", these returns are certainly available on request, and thus are "on the record forecasts", capable of scrutiny by the public. Because allocations of public money can be directly dependent on them, there is clearly a strong expectation that forecasts are accurate. The DfE has published guidance on what a forecast should comprise and gives examples of good practice. (See **References**).

The description of the forecasting methodology used which follows is based on a) the briefing provided to me by Brighton and Hove officers; b) my own scrutiny of the material provided; and c) the notes on forecasting contained within the SOPs.

Brighton and Hove's forecasting methodology for the primary phase is based on the observed consistent correlation between the number of children on the GP Register and those requiring a place in a maintained school or academy in the city. At Year R between 88% and 90% of the number on the GP ratio require a place at a school.

It should be noted that this does not necessarily mean that 88% or 90% of Brighton and Hove resident children attend school in the city. Some may cross the border and attend schools in East or West Sussex, just as some children from outside the city may commute in. The GP register may include children who have moved away and not been deleted. What matters is not whether the children in schools are the same children as are registered with GPs, but that there is a consistent and reliable correlation between the two numbers, and that therefore the GP register gives a good indication of the likely number of children requiring a school place in the future.

Apart from the potential differences between the two populations mentioned above, a proportion of children attend independent schools or are educated otherwise than at school. Nationally this comprises about 7% of children of statutory school age. Some Brighton and Hove children will fall into this group. A further complication is that boarding establishments generally register their pupils with a local GP, thus increasing the number of children in an area who do not appear on the roll of maintained schools. As there are several independent schools in the city this is likely to have an effect increasing the number of children on the GP register but not on roll at a maintained school. All of this, however, does not detract from the value of the GP register as a means of forecasting future need for school places. Alternative data to forecast Year R enrolment might include the register of births, however the relatively high rates of internal migration of very young families may not make this a good indication of the number to be admitted to school four years later.

The methodology used gives a forecast of three years likely admissions to Year R. This is at the core of the Brighton and Hove approach. In more recent forecasts this is taken a stage further to forecast the complete primary school population across all year groups from YR to Y6. The methodology used is very simple: each cohort is assumed to remain the same size throughout the primary years, so it has a survival ratio of 1 (or 100%). My analysis of the observed data suggests this is acceptable, as

the variation in survival rates from year to year do not form a clear or statistically significant trend.

GP registration data is supplied to the Council with postcode information. It is analysed to postcode sector level – i.e. the first part of the postcode plus the first digit of the second part of the postcode. This is aggregated to 10 planning areas, reflecting local judgements about natural community boundaries which would be recognised by residents. The postcode sectors themselves generally correspond to recognisable geographical communities (postcodes are built up from the "walks" of delivery staff, who tend to follow rational routes). Using this data and the observed ratio between GP registrations and school numbers, the likely level of future demand for given areas can be calculated, by multiplying the preschool age cohort numbers supplied from the GP register by the observed ratio.

A broadly similar approach has been used for secondary schools. Originally a ratio was calculated between observed numbers of 11 year olds on the GP register and observed numbers in Year 7. This was replaced by an improved system which compared the number of Year 6s recorded in the May school census analysed by catchment area of residence with the number of Year 7s recorded in the same area the following year. This was used to calculate a "drop-out rate" for the whole city, for two large areas (Hove and Portslade, and Brighton), and for six secondary catchment areas: (Portslade Aldridge Community Academy, Blatchington Mill and Hove Park, Dorothy Stringer and Varndean, Patcham, Brighton Aldridge Community Academy, and Longhill).

It should be stressed, however, that these calculations are **not** in relation to the number on roll at the named schools, but for the number of children living in those catchment areas who will require a place somewhere in Brighton and Hove. This could be at the local catchment school, or at a denominational school serving a wide community, or at a school in another part of the city as a result of parental preference. Throughout the city there is a loss of pupils between the primary and secondary phase and the calculation described above is designed to capture the effects of this. This loss could be as a result of parents securing places at maintained schools in neighbouring authorities, or at independent schools, or whole families migrating to other local authority areas. The precise explanation for this drop out is not important for forecasting purposes, providing there is a stable and predictable pattern from year to year.

In the more recent forecasts Cardinal Newman and King's School are extracted and dealt with separately on the basis that they draw children from a wide area, whose parents are seeking the denominational education they provide – an estimated number of children is deducted from each planning area accordingly. On top of that a percentage figure is deducted to reflect the observed phenomenon of "drop out" between Years 6 and 7.

As previously observed, this results in forecasts for the number of children living in the listed catchment areas who are expected to require a school place, however the place they ultimately secure may not be their catchment school. It also treats children whose

parents seek a denominational secondary school place differently. These children are deducted from the forecast of aggregated local demand. In the case of Cardinal Newman it is assumed that the school will fill to capacity – thus there is an assumed forecast of future numbers for that school built into the system. The forecasting system is designed to predict how many children living in each of the six catchment areas will require a school place (other than those who will go to Cardinal Newman or King's). This means if there is a demographic bulge in a particular area, decision makers can consider how to accommodate it. A potential weakness of the system however is that parental preference means that parents may not want a place at their catchment school, and will prioritise schools in other areas, and it should be remembered that unless a school is over-subscribed its over-subscription criteria are irrelevant (including catchment area) – the place must be offered.

It is very unusual for a school forecasting system not to make forecasts for individual schools. I have not come across such a system in the five local authorities in which I have worked as a permanent member of staff or consultant. An internet search of nearby local authorities, both county and unitary councils (East Sussex, Hampshire, Kent, Portsmouth, Southampton and West Sussex) indicates that all build up their forecasts from school level forecasts. (Links to their respective websites can be found in the **References** section below.) These authorities focus on the number of children who are likely to seek and secure a place at each school, where Brighton and Hove focuses on the number of children living in defined areas who will require a place. This does not mean Brighton and Hove has to adopt a similar approach if it feels that the methodology used meets its needs.

The lack of school level forecasts makes the accuracy analysis of sub-city planning groups quite difficult. If school level forecasts exist it is relatively straightforward to compare the forecast numbers for each school with the observed numbers in the pupil level annual school census (PLASC) conducted each January. Without school level forecasts it would be necessary to analyse the number of children *living* in each planning area *attending any* maintained school or academy in the city. Whilst PLASC has the data to enable this to be done, it is a complex analysis.

Even if the forecasts produced were 100% accurate five years ahead, this approach tends to obscure important facts about the numbers in particular schools. For example the forecast might correctly predict that 800 pupils would be living in School A's catchment area – however in practice 450 might travel across the city to attend School B instead, leaving only 350 in their local catchment school. Brighton and Hove's system is designed only to predict the number of children expected to be living in defined areas who will give rise to demand for a school place somewhere, not necessarily in their local catchment school, as a starting point for decision making about where and how any new places required should be provided. Whilst I am sure that officers and those close to school organisation decision making understand this, it is easily capable of misunderstanding by those not so close to school place planning analysis and decision making.

The strength of Brighton and Hove's approach is that it focusses attention on *the areas of the city* where children live which may require a greater or lesser number of school

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places. This may be helpful in deciding where to create additional capacity. However it does not take account of parental preference, which school level forecasting does. It has been suggested that school level forecasts are dependent on arbitrary judgements about the popularity of different schools. However there is ample evidence within the observed data on previous enrolment to make an objective and statistically valid projection of likely future enrolment. The Council may wish to consider developing a simple system to include school level forecasting, perhaps initially for the secondary phase. Apart from its value in relation to school place planning, this would provide useful information at school and local authority level for three year budget and curriculum planning.

Accuracy

In order to assess the accuracy of the forecasts I compared the numbers in the various published and working documents with PLASC figures. I did this for Year R, for Year R to Year 6 (the primary phase), Year 7, and Year 7 to Year 11 (the statutory secondary phase). I did not look at the accuracy of Y12 and Y13 (post 16) numbers. I calculated the numeric and percentage variation between the forecast and observed figures. This report highlights the percentage variation and gives includes a graphic representation of how the forecasts compare to the observed numbers in the PLASC.

It should be remembered that the forecasting methodology has been refined and improved over time, and that the earliest forecasts were much cruder than the more recent ones.

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Citywide forecasts for Year R

Please see the following pages for numeric and graphic analysis of the Year R forecasts. The table showing the percentage difference between the forecast and observed number on roll is colour coded – the shading indicates the absolute percentage variation and the text colour indicates whether it is positive (light text) – an over-forecast – or negative (dark text) – an under-forecast. *It should be remembered that a difference of 1% on a cohort of 2500 represents 25 pupils.*

It can be seen that in general the forecasts for Year R numbers have been accurate for one year ahead and reasonably accurate subsequently. They do however show a consistent upward bias (indicated by white text). The two most recent forecasts for January 2015, made in 2012 and 2013 were reasonably close to the observed figure.
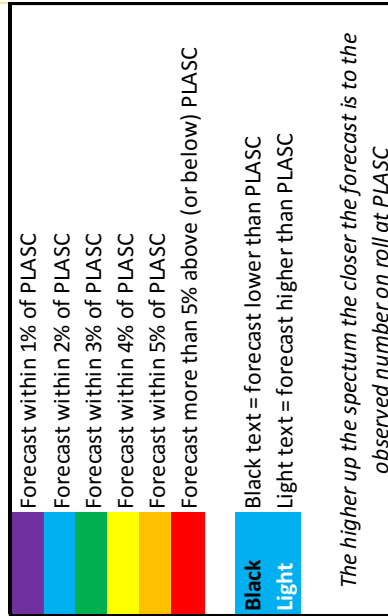
The graph shows that the forecasts generally predicted the observed trend well, including the slight dip in the 2013-14 cohort.

The red line shows the observed PLASC number on roll and the various dotted lines show the different forecasts made at previous times.
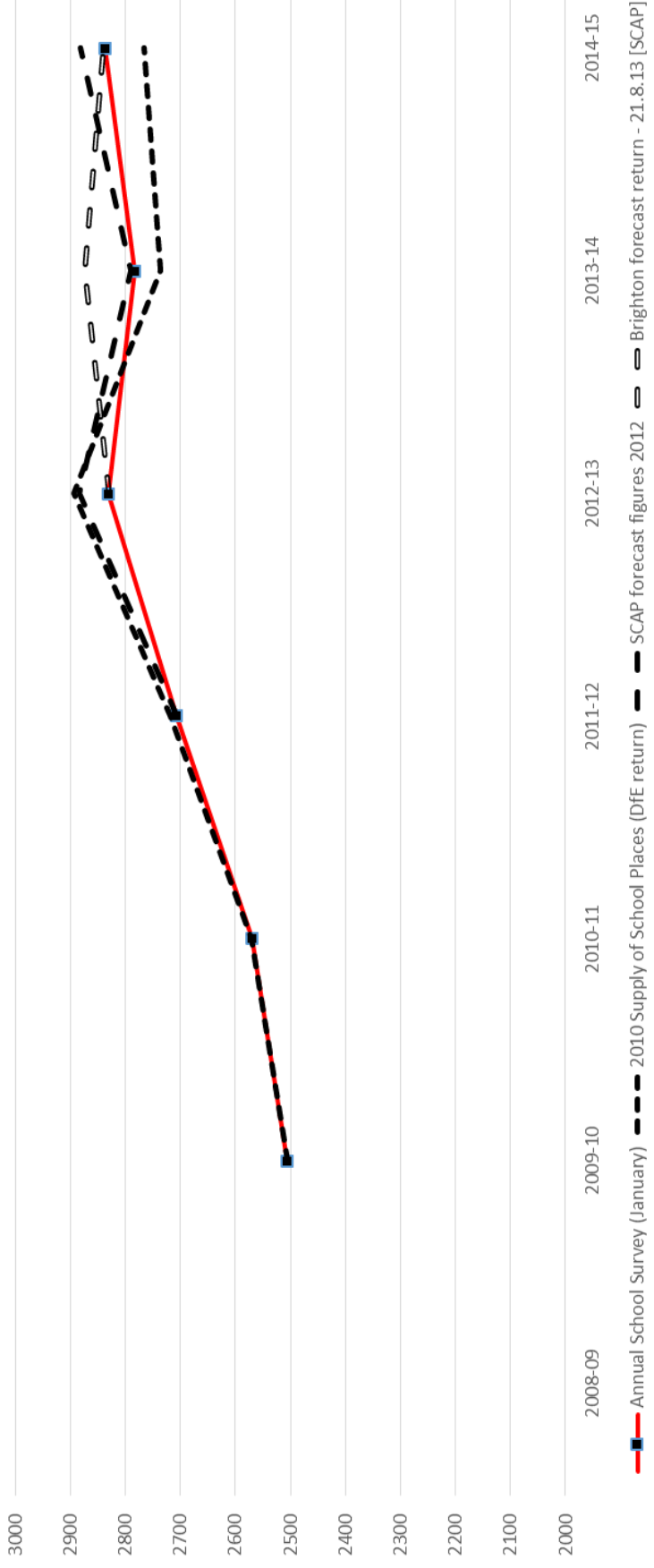
Citywide Year R

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Annual School Survey (January)	NA	**2506**	**2570**	**2707**	**2832**	**2784**	**2838**				
2009 Supply of School Places (DfE return)		NA	NA	NA	NA	NA	NA				
2010 Supply of School Places (DfE return)		2506	2571	2719	2894	2737	2767				
2010 10 October forecast workbook				2766	2916	2836	2669				
2011 10 October forecast workbook				2711	2883	2790	2881	2851	2850	2800	
2012 09 September forecast workbook						2787	2850	2861	2687		
2013 10 September forecast workbook							2896	2893	2820	2732	
School Organisation Plan 2013-17						2801	2897	2893	2821	2733	
2014 10 October forecast workbook								2819	2752	2690	2507
SCAP forecast figures 2012				2706	2883	2791	2881	2851	2925		
Brighton forecast return - 21.8.13 [SCAP]					2831	2874	2841	2861	2688	2730	

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Annual School Survey (January)		**2506**	**2570**	**2707**	**2832**	**2784**	**2838**
2009 Supply of School Places (DfE return)							
2010 Supply of School Places (DfE return)		0.00%	0.04%	0.44%	2.19%	-1.69%	-2.50%
2010 10 October forecast workbook				2.18%	2.96%	1.88%	-5.96%
2011 10 October forecast workbook				0.15%	1.80%	0.22%	1.52%
2012 09 September forecast workbook						0.12%	0.43%
2013 10 September forecast workbook							2.05%
School Organisation Plan 2013-17						0.61%	2.08%
2014 10 October forecast workbook							
SCAP forecast figures 2012				-0.04%	1.80%	0.25%	1.52%
Brighton forecast return - 21.8.13 [SCAP]					-0.04%	3.23%	0.11%

Legend:

- Forecast within 1% of PLASC
- Forecast within 2% of PLASC
- Forecast within 3% of PLASC
- Forecast within 4% of PLASC
- Forecast within 5% of PLASC
- Forecast more than 5% above (or below) PLASC

Black Black text = forecast lower than PLASC
Light Light text = forecast higher than PLASC

The higher up the spectum the closer the forecast is to the observed number on roll at PLASC

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SCAP forecasts for YR pupils compared to PLASC observed numbers

Legend:
- Annual School Survey (January)
- 2010 Supply of School Places (DfE return)
- SCAP forecast figures 2012
- Brighton forecast return - 21.8.13 [SCAP]

X-axis: 2008-09, 2009-10, 2010-11, 2011-12, 2012-13, 2013-14, 2014-15

Y-axis: 2000, 2100, 2200, 2300, 2400, 2500, 2600, 2700, 2800, 2900, 3000

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Year R to Year 6

Please see the following pages for numeric and graphic analysis of the Year R to Y6 forecasts. The table showing the percentage difference between the forecast and observed number on roll is colour coded – the shading indicates the absolute percentage variation and the text colour indicates whether it is positive (light text) – an over-forecast – or negative (dark text) – an under-forecast. *It should be remembered that a difference of 1% on an aggregate cohort of 17,000 at the primary phase represents 170 pupils across all primary age groups.*

The forecasts for Year R to Year 6 show a greater degree of accuracy. This would be expected as Y1-Y6 are continuing pupils within the primary phase. Apart from 2009 all subsequent forecasts have been very accurate. The 2009 forecast may have been distorted by the nature of the SCAP return required by DfE in that year. Improvements in the DfE SCAP requirements and Brighton and Hove's methodology have resulted in more accurate forecasts in recent years. The 2010 SCAP return was particularly accurate, never varying more than 1% even five years ahead. It should be noted, however, that there is a consistent upward bias: all forecasts since 2010 have slightly overstated the future number of pupils.

The graph shows that all primary forecasts since 2010 have been close to the observed numbers.

Citywide Year R to Year 6

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2018-19
Annual School Survey (January)	16405	16610	16919	17320	17663	18103	18496			
2009 Supply of School Places (DfE return)		16500	16550	16650	16700	16720				
2010 Supply of School Places (DfE return)		16617	16824	17304	17839	18257	18637			
2011 10 October forecast workbook				17338	17871	18319	18783	19191	19552	19766
School Capacity (Forecast) XML Template				17402	17962	18462	18714	19034		
SCAP forecast figures 2012					17807	18268	18741	19157	19604	
Brighton forecast return - 21.8.13 [SCAP]				17319	17654	18230	18681	19113	19351	19521

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Annual School Survey (January)		16610	16919	17320	17663	18103	18496
2009 Supply of School Places (DfE return)		-0.66%	-2.18%	-3.87%	-5.45%	-7.64%	
2010 Supply of School Places (DfE return)		0.04%	-0.56%	-0.09%	1.00%	0.85%	0.76%
2011 10 October forecast workbook				0.10%	1.18%	1.19%	1.55%
School Capacity (Forecast) XML Template				0.47%	1.69%	1.98%	1.18%
SCAP forecast figures 2012					0.82%	0.91%	1.32%
Brighton forecast return - 21.8.13 [SCAP]				-0.01%	-0.05%	0.70%	1.00%

Forecast within 1% of PLASC
Forecast within 2% of PLASC
Forecast within 3% of PLASC
Forecast within 4% of PLASC
Forecast within 5% of PLASC
Forecast more than 5% above (or below) PLASC

Black — Black text = forecast lower than PLASC
Light — Light text = forecast higher than PLASC

The higher up the spectum the closer the forecast is to the observed number on roll at PLASC

Brighton and Hove City Council: Pupil Number Forecasting System

SCAP forecasts for YR-Y6 pupils compared to PLASC observed numbers

Legend:
- Annual School Survey (January)
- SCAP forecast figures 2012
- 2009 Supply of School Places (DfE return)
- Brighton forecast return - 21.8.13 [SCAP]
- 2010 Supply of School Places (DfE return)

X-axis: 2008-09, 2009-10, 2010-11, 2011-12, 2012-13, 2013-14, 2014-15

Y-axis: 15000, 15500, 16000, 16500, 17000, 17500, 18000, 18500, 19000

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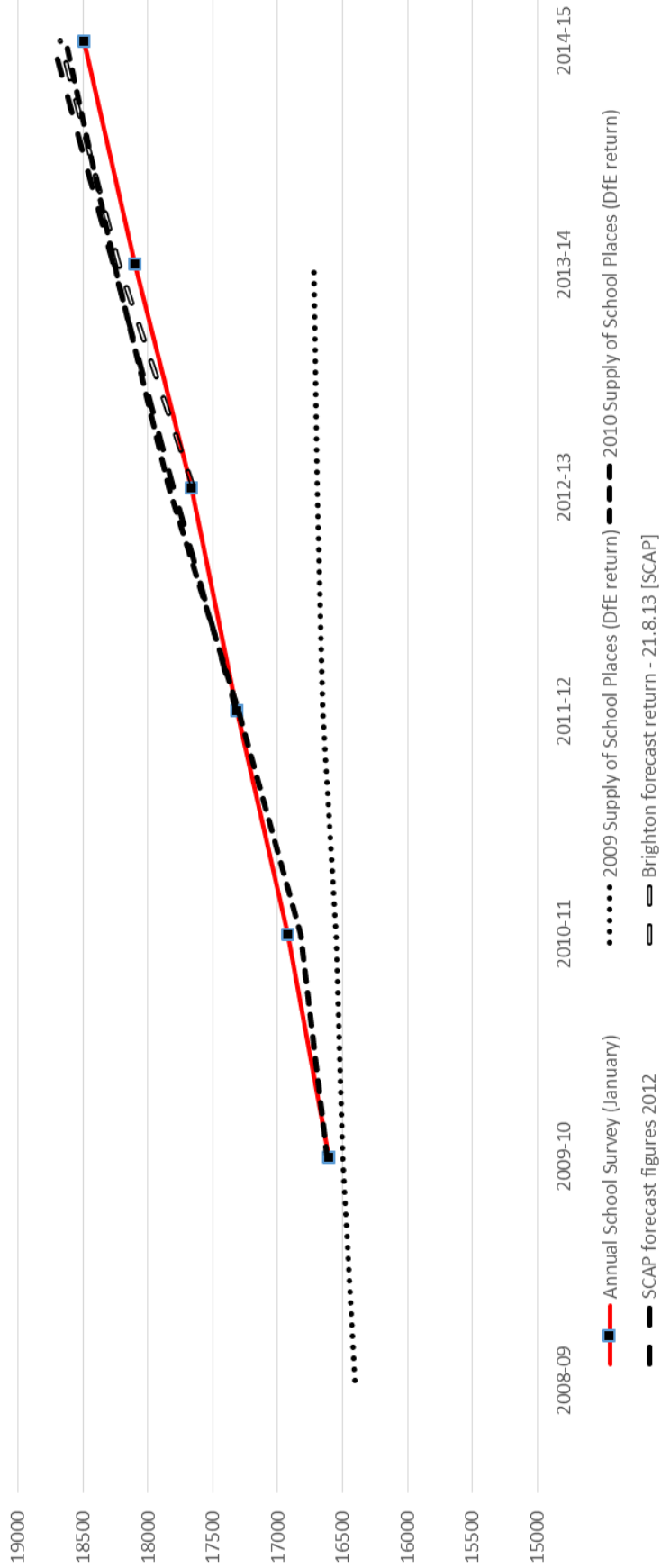
Year 7

Please see the following pages for numeric and graphic analysis of the Year 7 forecasts. The table showing the percentage difference between the forecast and observed number on roll is colour coded – the shading indicates the absolute percentage variation and the text colour indicates whether it is positive (light text) – an over-forecast – or negative (dark text) – an under-forecast. *It should be remembered that a difference of 1% on a cohort of 2300 represents 23 pupils.*

Forecasts for Year 7 numbers have generally not been as accurate as for Year R but accuracy has improved since analysis of primary secondary transfer was introduced, rather than using the GP register to forecast the initial year of entry to secondary schools. The exception is the 2012 SCAP which shows a high level of accuracy for three years. 2013 however is not as accurate, so it is not possible to conclude that the methodology has improved to the extent that might be wished. There is a consistent bias towards overestimating secondary numbers. It is notable that most of the forecasts substantially over-estimated numbers in 2013-14 but forecasts for 2014-15 have been better.
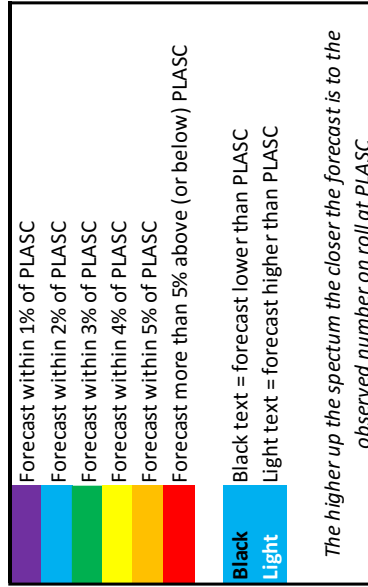
The graph shows that the earliest forecast (2010 SCAP) was substantially high, however it is interesting that it has the same general shape as the observed trend. This could indicate that there was a jump in the number of parents choosing schools outside the city (or the independent sector), thus shifting the primary-secondary survival ratio downwards. Alternatively it could reflect a higher number of GP registrations of children living in the city, but not attending maintained schools. However this is not of great importance as the methodology has changed.

The results improved as analysis of primary secondary transfer was introduced. Instead of using GP registration, recent forecasts have been based on the number of Year 6 children *living* in catchment areas as captured in the May Census, compared to the number of Year 7s living in the same areas the following school year. Future Year 7 cohorts are forecast using data about cohorts in the primary phase, and their rate of transfer to the secondary phase.

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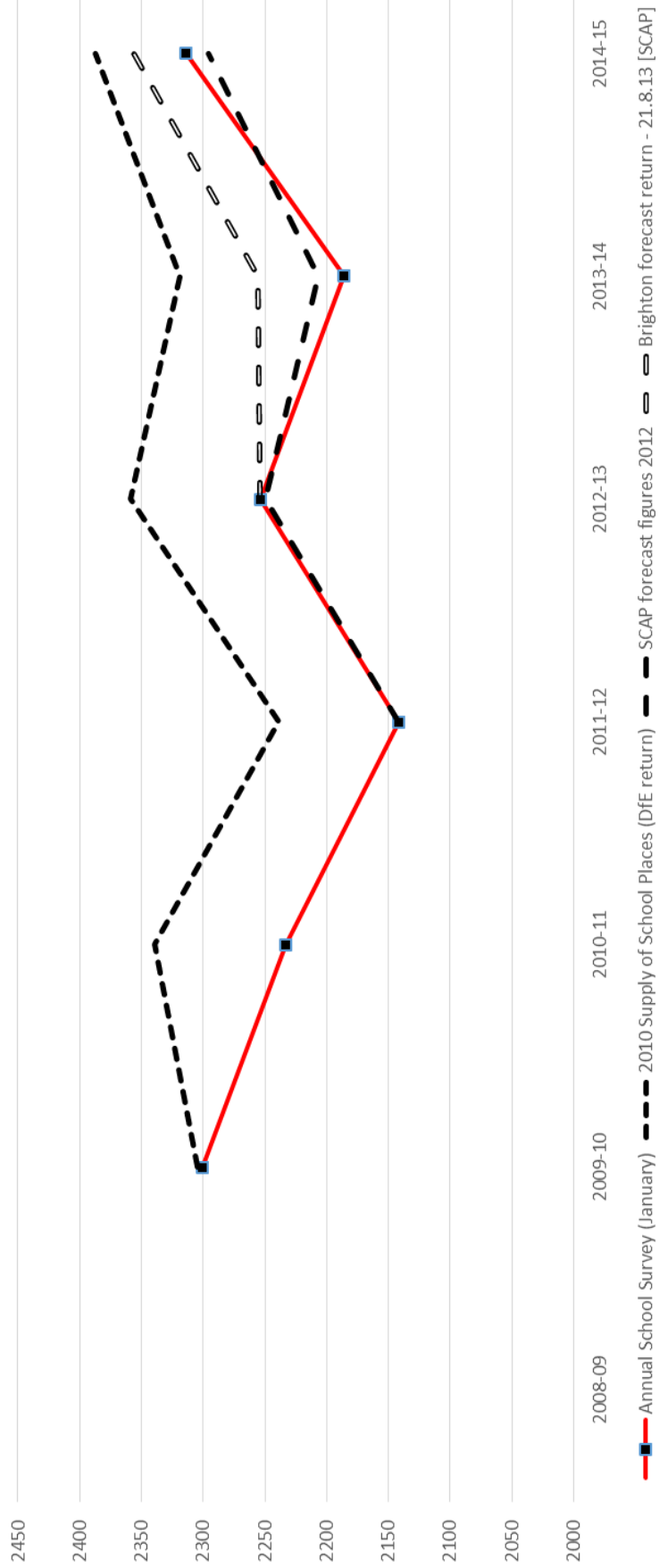**Brighton and Hove City Council: Pupil Number Forecasting System**

Citywide Year 7

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Annual School Survey (January)	NA	2301	2233	2142	2254	2186	2314								
2009 Supply of School Places (DfE return)	NA	NA	NA	NA	NA	NA	NA								
2010 Supply of School Places (DfE return)		2305	2339	2239	2359	2319	2387	2471	2478						
2011 10 October forecast workbook				2145	2350	2342	2417	2443	2489	2586	2711	2883	2790		
2012 09 September forecast workbook						2256	2356	2396	2429	2486	2631	2750	2703	2764	2774
School Organisation Plan 2013-17 (low)					2250	2280	2320	2350	2410	2550	2660	2620	2680		
School Organisation Plan 2013-17 (high)					2250	2360	2400	2430	2490	2630	2750	2700	2760		
SCAP forecast figures 2012				2142	2250	2207	2296	2329	2362	2416	2570				
Brighton forecast return - 21.8.13 [SCAP]					2254	2256	2356	2396	2429	2486	2632	2751			

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Annual School Survey (January)		2301	2233	2142	2254	2186	2314
2010 Supply of School Places (DfE return)		0.17%	4.75%	4.53%	4.66%	6.08%	3.15%
2011 10 October forecast workbook				0.14%	4.26%	7.14%	4.45%
2012 09 September forecast workbook						3.20%	1.83%
School Organisation Plan 2013-17 (low)					-0.18%	4.30%	0.26%
School Organisation Plan 2013-17 (high)					-0.18%	7.96%	3.72%
SCAP forecast figures 2012				0.00%	-0.18%	0.96%	-0.78%
Brighton forecast return - 21.8.13 [SCAP]					0.00%	3.20%	1.82%

Forecast within 1% of PLASC
Forecast within 2% of PLASC
Forecast within 3% of PLASC
Forecast within 4% of PLASC
Forecast within 5% of PLASC
Forecast more than 5% above (or below) PLASC

Black — Black text = forecast lower than PLASC
Light — Light text = forecast higher than PLASC

The higher up the spectum the closer the forecast is to the observed number on roll at PLASC

SCAP forecasts for Y7 pupils compared to PLASC observed numbers

Annual School Survey (January) — 2010 Supply of School Places (DfE return) — SCAP forecast figures 2012 — Brighton forecast return - 21.8.13 [SCAP]

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Year 7 to Year 11

Please see the following pages for numeric and graphic analysis of the Year R to Y6 forecasts. The table showing the percentage difference between the forecast and observed number on roll is colour coded – the shading indicates the absolute percentage variation and the text colour indicates whether it is positive (light text) – an over-forecast – or negative (dark text) – an under-forecast. *It should be remembered that a difference of 1% on an aggregate cohort of 11,000 at the secondary phase represents 110 pupils.*

The Year 7 to 11 forecasts have improved, the two most recent having a good citywide level of accuracy. Earlier forecasts tended to go awry after a relatively short period. There has been a bias towards over forecasting. It may be that changes to the organisation of secondary education in the city, with the academisation of two schools and the creation of a free school as well as some major rebuilding has disrupted patterns of enrolment. If future forecasts are to be reliable then it is important that there is further work to strengthen the Y7 forecasts, as these will cascade through to future years.

The graph shows that the earlier forecasts were not accurate, substantially over forecasting future numbers. Recent forecasts using a more sophisticated methodology have been much better.

Whilst the tendency to over- forecast should be addressed, this should not detract from the known reality of the bulge in numbers progressing through the primary phase who will need secondary places over the next decade. There can be no doubt that planning how to meet the additional need is a major priority for the city.

Whilst demography will undoubtedly lead to rising secondary rolls, it is clearly important that parents not only have access to secondary school places, but that they express a positive preference for the schools available.
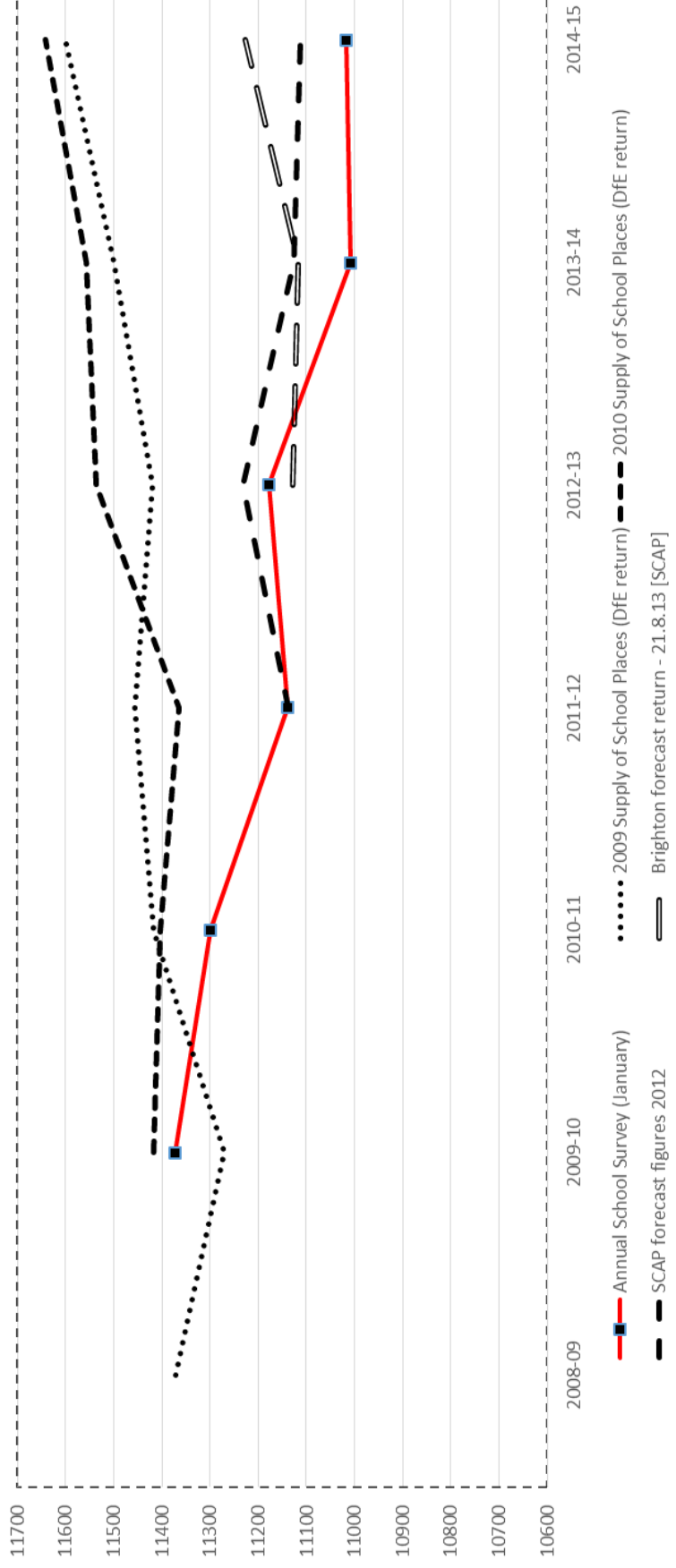
Year 7 to Year 11

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Annual School Survey (January)		11373	11299	11138	11178	11009	11018						
2009 Supply of School Places (DfE return)	11371	11270	11417	11457	11420	11500	11600	11650					
2010 Supply of School Places (DfE return)		11417	11404	11364	11536	11557	11643	11775	12014				
2011 10 October forecast workbook				11189	11320	11480	11584	11697	12041	12277	12646	13112	13459
SCAP forecast figures 2012				11138	11231	11127	11113	11223	11444	11610	11973		
Brighton forecast return - 21.8.13 [SCAP]					11128	11117	11227	11336	11557	11923	12299	12694	

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Annual School Survey (January)		11373	11299	11138	11178	11009	11018
2009 Supply of School Places (DfE return)		-0.91%	1.04%	2.86%	2.16%	4.46%	5.28%
2010 Supply of School Places (DfE return)		0.39%	0.93%	2.03%	3.20%	4.98%	5.67%
2011 10 October forecast workbook				0.46%	1.27%	4.38%	5.14%
SCAP forecast figures 2012				0.00%	0.47%	1.07%	0.86%
Brighton forecast return - 21.8.13 [SCAP]					-0.45%	0.98%	1.90%

Legend:

▣ (blue)	Forecast within 1% of PLASC
▣ (green)	Forecast within 2% of PLASC
▣ (yellow)	Forecast within 3% of PLASC
▣ (orange)	Forecast within 4% of PLASC
▣ (red)	Forecast within 5% of PLASC
	Forecast more than 5% above (or below) PLASC
Black	Black text = forecast lower than PLASC
Light	Light text = forecast higher than PLASC

The higher up the spectum the closer the forecast is to the observed number on roll at PLASC

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SCAP forecasts for Y7-Y11 pupils compared to PLASC observed numbers

Legend:
Annual School Survey (January)
SCAP forecast figures 2012
2009 Supply of School Places (DfE return)
2010 Supply of School Places (DfE return)
Brighton forecast return - 21.8.13 [SCAP]

Brighton and Hove City Council: Pupil Number Forecasting System

Conclusion

The Brighton and Hove pupil forecasting system is remarkably simple requiring only GP Registration data supplied by postcode, and current numbers on roll for the primary phase, and the "drop-out" rate between Year 6 and Year 7 at the postcode sector level for the secondary phase.

There is an observed stable relationship between the number of children on the GP register and those who subsequently require a school place. This relationship is sufficiently stable to provide a reasonably accurate forecast. The ratio is adjusted from time to time to reflect any changes that might be observed. Most local authorities use a similar approach as a starting point for Year R forecasts. The "drop out" rate methodology is an improvement on the earlier system for forecasting Year 7 demand, although there is some instability, perhaps due to the changes in the organisation of secondary schools in the city in recent years.

Brighton and Hove then uses a 100% cohort survival rate to forecast older age groups. This too seems good enough to produce reasonably accurate forecasts at citywide level, although many authorities calculate survival ratios based on observed data – often using a three year rolling and weighted average. It may well be that Brighton and Hove's approach is just as accurate, as there is much unexplained random variation in year to year cohort survival, particularly at school level.

What is unusual about Brighton and Hove's forecasts is that they do not include school level forecasts. It could be argued that these are unnecessary. They are not currently required for SCAP returns, and neither are they generally published in School Organisation Plans (or similar documents) even by those authorities that produce school level forecasts for their own managerial purposes, and to support decision making in relation to specific school organisation or admissions challenges. Undoubtedly not making school level forecasts makes the whole system much simpler, and presumably saves considerable cost and officer time. However school level forecasts might be valuable for determining where and how additional places should be added in order to take into account parental preference as well as the geographical location of forecast population growth.

The DfE gives advice on the preparation of forecasts (Department for Education (June 2014), School Capacity (SCAP) Survey 2014: Guide to forecasting pupil numbers in school place planning, see **References**). Whilst this does not make explicit reference as to whether school level forecasts should be prepared, this can be inferred from many of its recommended approaches:

> You also need historical data to determine past trends, for example, to measure the pattern of how the number of year 6 children historically relates to the number of year 7 children in the following year. *At school level* you could do this by looking at trends of pupil transfer from primary schools or pupils within geographic areas. (p 12 Section 3: Making Your Projections)

The role of school level forecasts is mentioned in the context of the local authority case studies appended to the guidance:

Cambridgeshire County Council

Schools are sent the forecasts for comment before the authority releases their final forecasts.

…

Individual primary school forecasts are adjusted for expected major changes in house building within the catchment area, where the development(s) have full planning permission. (pp 27-28 Cambridgeshire County Council case study)

Essex County Council

Tables reporting on accuracy of forecasts at local authority level and *at school level* summarised at local authority and district level are published each year in Commissioning School Places in Essex (a publication available on ECC's website). (p 29 in respect of a case study of Essex County Council's methodology).

Sheffield City Council

Step 1: change in number on role (NOR) – from each snapshot the NOR was *aggregated to school level* and broken down by national curriculum year group (NCY). The difference is then calculated to give the change in NOR by NCY *for each school*.

…

Step 3: aggregate pupil movement *to school level* – the final step works up the individual pupil in-year movements *to school level*. The procedure counts the number of starters and leavers *for each school*, distinguishing whether pupil is new to the maintained system, transferring internally, or leaving the maintained system.

Whilst there is a spread of in-year admissions across the city, there are clear pockets of high mobility. This is monitored at *individual school level* and updated very frequently. (p. 30-31 Sheffield City Council case study)

It is for Brighton and Hove City Council to decide whether it wants to include school level forecasts within its system, or whether it feels that its citywide and planning area forecasts of expected demand meet its requirements, and no further level of detail is called for.

Recommendations

1. Senior decision makers (officers and elected members) should agree a specification for the forecasts they require, taking into account the likely school organisation decisions that will need to be taken and the level of public scrutiny this might entail; the requirement to produce an annual school capacity return including forecasts for the Department for Education; continuing to produce a School Organisation Plan; the Council's own strategic decision making around investment in school buildings, agreeing admissions arrangements including permanent or temporary changes to published admission numbers; and planning budgets at school and LA level.

2. The specification should include:
   a. The frequency of forecasts – I would recommend annual
   b. The timing of forecasts – I would recommend somewhat in advance of the requirement to produce a school capacity return to the DfE.
   c. The date to which the forecast refers – I would recommend mid-January to coincide with the PLASC, thereby allowing easy comparison between forecast and census numbers.
   d. The data to be included – I would recommend as a minimum (as now):
      i. citywide number expected in YR (for a minimum of three years ahead) and in Y6 (for a minimum of ten years ahead)
      ii. citywide number on roll in each national curriculum year (same forecast horizons)
      iii. citywide total number on roll in the primary (YR to Y6), statutory secondary (Y7 to Y11) and post 16 (Y12 and Y13+) phases
      iv. citywide total number on roll post 16
      v. demand for places in planning areas, particularly at YR and Y7 (i.e. as at present the number living in specified areas who are likely to require maintained school places)
   e. I would recommend that the following accompany each set of forecasts:
      i. a brief factual statement on the accuracy of previous forecasts in the light of observed data and comments on any significant variance
      ii. A brief statement setting out the methodology used
   f. In addition I would recommend:
      i. An estimate of the likely number of future births using ONS population projections, or similar demographic projections, to extend primary forecasts beyond the three year horizon, suitably caveated.
      ii. An estimate of the additional pupils that may move into the city as a result of housing development, using input from Planning colleagues on housing trajectories, and expressed as an additional number to the main forecast. If no such development is expected, or no additional pupils are likely to arise, then this should be explicitly stated.
   g. Decision makers should consider whether school level forecasts should be produced at primary phase, secondary phase or for all schools. To do this would require significant additional work, a more sophisticated methodology, and thus additional cost (or the sacrifice of other managerial

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activities). However, it would help to identify schools at risk of low numbers, surplus places and consequent unviability; or under pressure from growing populations, or very high levels of parental preference. It could help schools and the council plan budgets by giving them more advance warning of changes in numbers on roll. It would also enable the methodology and accuracy of the forecasts to be more rigorously monitored.

3. The Council should decide if it wishes to produce a School Organisation Plan (or equivalent), and if so its frequency. I would recommend that it does so either every two or three years, with a brief update including revised forecasts in the intermediate years. All these should be put in the public domain and shared (proactively) with schools. The previous Brighton and Hove School Organisation Plans seem entirely appropriate in terms of format and level of detail, but it may be helpful to look at the equivalent documents from other authorities for ideas about how it might be developed. For example, some SOPs attempt to look further ahead. See Appendix B for extracts from the relevant documents. Links are provided in the **References** section.

4. When making or commenting on school organisation proposals the Council should, so far as possible, rely on the annually produced forecast to justify its position. One good robust forecast per school year should be adequate for all school organisation decision making.

5. Further improvement to the secondary school forecasting methodology is recommended to improve the medium and long term level of accuracy. There is a strong case for making secondary forecasts at school level – even if primary forecasts are at city and planning group area only. To some extent this is recognised already in the special treatment given to the denominational schools, where a planning area/catchment area approach does not work well. With some significant changes to school organisation in recent years including the establishment of two academies and a free school, and the disruption associated with some major school building projects, it is not surprising that secondary forecasting has been difficult. However the underlying demography of Brighton and Hove (as well as nationally) clearly indicates that the population bulge currently in the primary phase will move through to the secondary phase over the next ten years. This will inevitably require new school capacity to be commissioned, and thus the need for robust forecasts which are likely to be subject to close scrutiny.

6. A more sophisticated forecasting system would entail additional costs. Options could include developing a new in-house approach based on the methods set out the DfE guidance, (this would depend on there being data and/or ICT staff with the skills to undertake this work); commissioning a bespoke system for Brighton and Hove, which would then be maintained in-house by being populated with the necessary data each year; asking a neighbouring authority to undertake forecasting using its existing staff and systems; or purchasing a commercially available forecasting service. It should be recognised that local authorities with more sophisticated systems generally have one or more dedicated staff assigned to the task. The most elaborate systems, such as that of the Greater London Authority or Essex County Council have a team of staff and use a very broad range of input data, which is time consuming to collect and analyse.

References

Department for Education (June 2014), School Capacity (SCAP) Survey 2014: Guide to forecasting pupil numbers in school place planning

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/321711/SCAP_guide_to_forcasting.pdf

East Sussex Education Commissioning Plan 2015

https://new.eastsussex.gov.uk/educationandlearning/management/download/

Hampshire School Place Planning Framework 2013-2018

http://www3.hants.gov.uk/education/schools/school-places.htm

Kent County Council - Commissioning Plan for Education Provision in Kent 2015-2019

http://www.kent.gov.uk/__data/assets/pdf_file/0018/16236/Commissioning-plan-for-education-provision-in-Kent-2015-2019.pdf

Portsmouth City Council School Organisation Plan 2013

https://www.portsmouth.gov.uk/ext/documents-external/cou-policies-school-organisation-plan.pdf

Southampton City Council School Organisation Plan 2014

https://www.southampton.gov.uk/policies/School-Organisation-Plan-2014-2024.pdf

West Sussex Planning School Places 2015

https://www.westsussex.gov.uk/learning/west_sussex_grid_for_learning/management_info__services/school_organisation_and/planning_school_places_2015.aspx

Appendix A

A description of the forecasts supplied by Brighton and Hove City Council

This appendix describes the forecasts supplied by Brighton and Hove City Council, explaining the methodology used and outputs produced. They are presented in chronological order, and show how the model has been adapted and improved over six years. A total of 13 forecasts have been provided of which four are SCAP returns to the DfE [two not yet included in this appendix]; two are School Organisation Plans, and the remainder "forecast workbooks" – internal working documents.

1. 2009 Supply of School Places (DfE return)

Date: 27 July 2009

General description: a PDF of the annual return on "The Supply of School Places" to DfE.

Detail: A list of all schools with number on roll and net capacity for all schools in 2009 and 2008, and a forecast of total number on roll for: a) Reception to Year 6; b) Years 7 – 11; c) Years 12 and 13; and d) Total secondary. There was the option of giving "LA District" forecasts – not relevant to Brighton and Hove as a unitary authority.

There is also a brief description of the methodology used (live births, GP registration, PLASC, emphasising that it is not based on estimates provided by schools. Primary numbers adjusted downwards to take account of net emigration through the age range. A weighted average for primary secondary transfer plus net emigration. No changes in boundaries or age of transfer anticipated. Housing developments "are taken into account as the department is notified of them." 4 or 5 large scale housing developments planned – but not taken into account until more definite.

Observation: this only provides citywide forecasts at the level of total YR to 6 (primary), total Y7 to Y11 (statutory secondary), and total Y12 and 13 (sixth form).

2. Summary of School Data (DfE return)

Date: 2010

General description: an Excel spreadsheet of the annual return on "The Supply of School Places" to DfE.

Detail: A list of all schools with number on roll and net capacity for all schools in January and May 2010 on roll for each national curriculum year group. A forecast for expected numbers in each national curriculum year group is provided to 2014/15 for YR to Y6, and to 2016/17 for Y7 to Y13.

There is also a similar brief description of the methodology used. Interestingly the forecast cohort survival rate is generally shown to be 100% - including primary to secondary transfer.

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3. 2010 10 October forecast workbook (Excel spreadsheet)

Date: October 2010

General description: an officer working spreadsheet not intended for publication, including citywide data comparing GP registration data with number on roll, and workings relating to two sub-city areas, and three year forecasts for YR only

Sheet 1: "summary"

> Number of children on GP register as of 2010 with dates of birth falling into given school year ranges from 1 September 1999 to 31 August 2000, to 1 September 2009 to 31 August 2010, compared with total (citywide) numbers of children on roll in September 2011.

> A percentage is calculated, **where %age children looking for a school place = YR/GP Reg * 100** for age groups born to 1 September 2006 to 31 August 2007. These percentages range between a low of 88.09% (born 03 to 04) and a high of 90.04% (born 06 to 07)

> Future numbers for age groups born thereafter assume 89.5% of GP registered children will be looking for a school place, i.e. to Year R admissions in September 2014. This figure seems to be based on judgement rather than calculation, reflecting the average take up and the most recent slightly higher figure. Forecasts for three years ahead are provided.

Sheet 2: "Hove"

> This sheet copies all the information for the previous sheet plus an analysis of children living in postcode sectors BN3 1 to BN3 8. There is no evident forecast within it (although many columns are untitled).

Sheet 3: "Westdene"

> This sheet copies all the information for the previous sheet plus an analysis of children living in postcode sector BN1 5. This sheet includes a three year forecast for the BN1 5 postcode sector. It uses the same percentage of GP registration data (89.5%) as the citywide analysis.

Sheet 4: "school year by postal sector"

> This sheet comprises an analysis of GP registration data as of 2010 by school year group and all postcode sectors in Brighton and Hove, and a comparison with 2009 data.

Observation:

> This working spreadsheet is clearly intended for internal use only. It provides a three year forecast of the likely number of YRs for the city as a whole, and for one postcode sector. Its method is to compare the number of children on the GP register with the number on school rolls, and assume that a similar proportion of future cohorts will require a school place. It does not forecast

the effect of YR admissions on the total size of the primary school population (YR-Y6), not does it forecast Y7 admissions.

4. 2011 10 October forecast workbook (Excel spreadsheet)

Date: October 2011

General Description: An analysis of GP register by postcode sector, compared with pupils on roll, sub-district analysis and forecast for primary and secondary numbers

Sheet 1: "postal sectors"

> An analysis of the GP registrations as of 18th October 2011, for school year groups from 1992/93 to 2010/11 by all postcode sectors in Brighton and Hove

Sheet 2: "overall comparison"

> An analysis of the same data, but with Y12 and above excluded and calculation of the relative size of younger cohorts in each postcode sector.

Sheet 3: "% pupil places"

> Number of children on GP register as of 2011 with dates of birth falling into given school year ranges from 1 September 1996 to 31 August 1997, to 1 September 2010 to 31 August 2011, compared with total (citywide) numbers of children on roll in September 2012.

> A percentage is calculated, **where %age children looking for a school place = YR/GP Reg * 100** for age groups born to 1 September 2006 to 31 August 2007. These percentages range between a low of 87.98% (born 00 to 01) and a high of 90.42% (born 06 to 07)

> Future numbers for age groups born thereafter assume 89.5% of GP registered children will be looking for a school place, i.e. to Year R admissions in September 2014. This figure seems to be based on judgement rather than calculation, reflecting the average take up and the most recent slightly higher figure. Forecasts for three years ahead are provided.

Sheets 4 to 6: "hove", "westdene" and "portslade"

> These sheets contain sub-district analysis including forecasts of expected resident YRs, and a list of the primary schools in the sub-district with the number of forms of entry.

Sheet 7: "forecasts"

> This is the principal output worksheet. It contains actual numbers (including YR offers) for the current year (2011/12) and primary forecasts up to school year 2017/18 for all year groups from YR to Y6. To school year 2015/16 Year R forecasts are based on 89.5% of the GP registration data (although not identical with the figures on Sheet 2). An estimate of future YRs (as yet unborn) appears to assume similar numbers to the latest available year.

Subsequent age groups are assumed to have a 100% survival rate for the remainder of their time in the primary phase.

A forecast is also provided for secondary numbers including BACA and PACA to 2021/22. Y7 numbers assume a 100% survival rate from the previous year's Y6. Similar survival rates are assumed through to Y11.

5. 2012 09 September forecast workbook (Excel spreadsheet)

Date: September 2012

General Description: An analysis of GP register by postcode sector, compared with pupils on roll, sub-district analysis and forecast for primary and secondary numbers

Sheet 1: "By Postal sector"

A similar postcode sector analysis to previous sheets, based on GP registration data from 25th September 2012

Sheet 2: "By Ward"

An analysis of the same data, except by ward rather than postcode sector.

Sheet 3: "Primary planning areas"

An analysis of GP registered and pupil on roll data and a citywide three year forecast assuming on this occasion 90% of GP registered pupils requiring a school place. [Brighton and Hove officers observed: We had noticed an increase in the percentage of pupils on GP registers looking for a school place and therefore increased this percentage accordingly.]

There is then a primary planning area forecast for the 10 primary planning areas: Portslade, South Central Hove, Hangleton and Hove Park, West Blatchington and North Hangleton, Westdene to Seafront, Hollinbury and Preston Park to Seafront, Moulscoomb and Coldean, Patcham, Queens Park and Whitehawk, and The "Deans".

Each planning area comprises one or more postcode sectors. The primary schools within the relevant sectors are listed at the head of the column, below which follow the GP registrations by school year of birth for that sector, and a forecast of future need based on 90% of the GP registered number. Further columns give the number of places available at the listed schools and a calculated shortfall or surplus. *It should be stressed that these forecasts simply relate to the number of children living in specified primary planning areas: it is not necessarily the case that their parents will seek a place in that area (although many will): postcode sectors are invisible on the ground and parents are likely to seek places at schools which best meet their needs and preferences. Indeed there are some postcode sectors where there are no schools, and others where there are several. [Brighton and Hove colleagues observe: The planning areas were chosen because the postcode boundaries tend to be barriers that parents will not cross in terms of expressing a school preference such as a railway line or a particular road etc.]*

Sheet 4: "secondary workings"

The first part of the worksheet lists all secondary schools in the City with details of number on roll based on the May 2013 census. Some planning areas comprise one school, others up to three as shown below:

Planning Area	Schools
Portslade	Portslade Aldridge Community Academy
Hove	Hove Park Blatchington Mill Cardinal Newman
Brighton	Dorothy Stringer Varndean
Patcham	Patcham High
The Deans	Longhill High
Moulsecoomb and Coldean	Brighton Aldridge Community Academy

The percentage share of pupils at schools in each planning area in each year group is calculated.

There is then an analysis of offers of places for 2013.

Sheet 5: "Secondary planning areas"

These comprise analysis of the number of GP registered children/young people in each planning area (Brighton ACA, Blatchington and Hove Park, Longhill, Portslade ACA, Patcham, and Stringer and Varndean), compared with the total number on roll in the May census. A percentage of GP registered young people at secondary schools in Brighton and Hove is calculated. The percentages calculated range from 82.3% (Y11 in September 2012) to a high of 84.6% (Y10 in September 2012). Forecasts of future Y7 intakes is based on 87.27%, although the reason for choosing this figure is not given. This gives forecasts forward to September 2022.

The first area to be forecast is for the area of Portslade (comprising PACA and Kings School) which is forecast to have 4.43% of those requiring a school place, then for Hove (comprising Blatchington Mill, Hove Park and Cardinal Newman) which is expected to have 43.62% of those seeking a place; Brighton (Dorothy Stringer and Varndean) – 27.75%; Patcham (Patcham High) – 9.44%; The Deans (Longhill) 10.22%; and Moulescoomb (BACA) – 4.74%. These are then totalled to provide a citywide forecast for the total secondary demand to 2020.

Observation:

The forecast relies on there being a stable percentage of GP registered children and young people who require a school place. It does not assume any net migration which might change the size of cohorts before they reach admission age.

6. Brighton and Hove School Organisation Plan 2012 to 2016

Date: unknown

Description: a School Organisation Plan setting out future need for school places. It contains primary forecasts for Year R to Y6 and secondary forecasts for Y7 to Y11. There is no detailed description of the methodology used. Beyond the use of GP registration data. All subsequent year groups after YR assume a 100% survival rate, including transfer from primary to secondary phase.

7. 2013 10 September forecast workbook (Excel spreadsheet)

Date: September 2013 [?]

General Description: An analysis of GP register as of 14th November 2013 by postcode sector, compared with pupils on roll, sub-district analysis and forecast for primary and secondary numbers

Sheet 1: "By Postal Sector"

> As in earlier forecast workbooks.

Sheet 2: "The Deans"

> A three year forecast for YR admissions for the specified area using the methodology previously described, and applying a 90% ratio between GP registration and school enrolments

Sheet 3: "By Ward"

> Analysis of GP reg data by ward.

Sheet 4: "By Catchment"

> An analysis of the GP reg data by catchment. As Cardinal Newman and Kings School do not have catchments, they are not mentioned, however the Brighton and Hove resident children would be somewhere within the city's GP reg data.

Sheet 5: "Original planning areas"

> An analysis of GP reg and forecast of YR numbers based on 90%. Same areas as used in Sheet 3 of 2012 09 September forecast workbook.

Sheet 6: "BN1 to BN4"

> A three year forecast for YR admissions for the specified area using the methodology previously described, and applying a 90% ratio between GP registration and school enrolments

Observation: no secondary forecast included

8. Brighton and Hove School Organisation Plan 2013 to 2017

Date: 27th March 2014 (approved by Council)

Description: a School Organisation Plan setting out future need for school places. It contains primary forecasts for Year R and secondary forecasts for Y7. It describes the methodology used, explaining the use of GP registration data, analysed by postcodes, and historic trends of enrolment in the state maintained sector. It explains that planning areas are not catchment areas and that there is no expectation that children living in the planning area will necessarily attend a school in that area, it does nevertheless show the surplus or shortfall of places for each area.

It explains the secondary forecast methodology, again using GP registration data by catchment area, and the way in which Cardinal Newman and Kings School are treated, drawing pupils from across the city. Two forecasts are offered: a low forecast based on 84.5% of GP registered children requiring a Y7 place, and a high forecast assuming 87.5%. It is stated that "in recent years [the transfer rate] has been 84.5%. The forecast is presented simply as the total citywide demand for Y7 places.

9. 2014 10 October forecast workbook (Excel spreadsheet)

Date: September 2014

General Description: An analysis of GP register as of 14th October 2014 by postcode sector, compared with pupils on roll, sub-district analysis and forecast for primary and secondary numbers

Sheet 1: "By Postal Sector"

As in earlier forecast workbooks.

Sheet 2: "By Catchment"

Forecast for expected Y7 numbers to 2025 by catchment area and for Cardinal Newman and Kings School combined. The forecast assumes a given percentage of GP registered pupils will require a school place in each of the catchment areas and deducts a number from each catchment expected to go to the two denominational schools,.

Sheet 3: "Planning areas"

Forecast for expected number of YRs to 2018 based on 90% of GP registered children requiring a place. An analysis and three year forecast to 2018 follows for each of the planning areas.

10. 2014 12 December forecast workbook (Excel spreadsheet)

Date: December 2014

General Description:

This is a reworking of the previous spreadsheet to model various scenarios. It models scenarios based on PACA with a PAN of 240 and with a PAN at 180. It calculates surplus and shortfalls assuming in three scenarios: a) that all places at Cardinal Newman and Kings Schools were offered to Brighton and Hove pupils, b) that a proportion are offered to non-Brighton and Hove pupils; and c) assuming a city wide surplus of 150 is desirable to enable the exercise of parental preference.

11. 2015 05 May forecast workbook (Excel spreadsheet)

Date: May 2015

General description:

This is a reworking using updated GP registration data, and modelling the same scenarios as previously.

Appendix B: Extracts from other local authority documents describing their forecasting systems

[My highlights in italics]

East Sussex Education Commissioning Plan 2015

4.2 Schools Forecasting

4.2.1 School place planning predictions in this document are derived mainly from the Council's pupil forecasting model. The version of the forecasts used to inform this plan is the January 2014 Pupil Census Based Projections as updated on 1 July 2014.

4.2.2 The model produces forecasts of the number of children and young people in state funded primary and secondary schools in East Sussex (including voluntary aided schools, free schools and academies).

4.2.3 The model forecasts pupil numbers:

- Countywide

- For each district and borough

- For each primary and secondary school place planning area (based largely on admissions areas)

- *For each individual primary (including infant and junior) and secondary school*

4.2.4 The forecasts are used for a number of purposes. These include:

- Pupil place planning, including inputs to the Education Commissioning Plan

- To prepare the annual School Capacity Return to central government

- To inform S106 development contributions assessments

- To help the Council respond to strategic planning and Community Infrastructure Levy (CIL) consultations on future infrastructure needs

- To inform decisions on future Published Admission Numbers (PANs) and input to statutory consultations

4.2.5 In producing pupil forecasts a number of key factors are taken into account. These include

- Existing and planned capacities of school places as well as published intake numbers

- Existing numbers of pupils in schools (from pupil census data)

- Future births and resulting primary Reception year numbers

- Parental preference for all-through primary and infant Reception year, junior Year 3 and secondary Year 7 places as expressed through the school admissions system

- Transfer (cohort survival) rates between school year groups

- Transfers and transfer rates between infant and junior and primary and secondary schools

- Staying-on rates into school sixth forms

- Additional pupils arising from new housing development in each area

4.2.6 For academic year 2014/15, Reception year predictions in this plan are based mainly on Admissions Allocations. For 2015/16 and 2016/17 account is taken of both GP registration and live birth data. The 2017/18 Reception year forecasts are based mainly on GP registration data. In the absence of hard data on children already born, reception year predictions for years 2018/19 and beyond are based on ESCC's Policy Based Population Projections of future births.

4.2.7 ESCC regularly reviews and refines its forecasting methodology to ensure that its pupil forecasts are as accurate as possible. The countywide three year forward forecast made in 2011 for Academic Year 2013/14 achieved the following levels of accuracy:

- Primary reception year: (- 0.4%)

- Primary total number on roll :(+0.8%)

- Secondary Year 7: (+1.7%)

- Secondary total number on roll: (+1.2%)

Hampshire School Place Planning Framework 2013 – 2018

Forecast:

The reception year intake is estimated using Small Area Population Forecasts (SAPF) of 4-year-olds produced by HCC Research & Intelligence Group. Other year groups are based on the number of pupils on roll from the January School Census. The expected pupil yield from new housing is also produced by HCC Research & Intelligence Group.

Our forecasting model works out a participation rate for each primary/infant school, which is the number of Year R pupils as a percentage of the estimated number of 4-year-olds in the catchment area. A weighted average for the past three years is calculated and projected forward to forecast the next 5 years. A similar process is used for junior/secondary schools using the number of Year 3/7 pupils as a percentage of the Year 2/6 pupils in their feeder school(s) respectively. The remaining year groups are rolled forward with an adjustment for historic year-on-year changes and for additional pupils due to any housing developments within the

school's catchment area during this period. The number of pupils in school sixth forms is assumed to be constant over the next 7 years.

In rural areas, schools' SAPF numbers are relatively small which often results in out catchment children attending these schools. This impacts on the participation rate which, due to the nature of the forecasting model, continues to add these children proportionally when the SAPF rises, thereby inflating numbers beyond reality. Such areas are detailed in the planning area information below.

Commissioning Plan for Education Provision in Kent 2015 – 2019

8. Forecasting Methodology

8.1 To inform the process of forecasting Primary school pupil numbers, KCC receives information from the Kent Primary Care Agency to track the number of births and location of pre-school age children. The pre-school age population is forecast into Primary school rolls according to trend-based intake patterns by ward area. Secondary school forecasts are calculated by projecting forward the Year 6 cohort, also according to trend-based intake patterns. If the size of the Year 6 cohort is forecast to rise, the projected Year 7 cohort size at Secondary schools will also be forecast to rise.

8.2 It is recognised that past trends are not always an indication of the future. However, for the Secondary phase, travel to school patterns are firmly established, parental preference is arguably more constant than in the Primary phase and large numbers of pupils are drawn from a wide area. Consequently, forecasts have been found to be accurate.

8.3 *Pupil forecasts are compared with school capacities* to give the projected surplus or deficit of places in each area. It is important to note that where a deficit is identified within the next few years work will already be underway to address the situation.

8.4 The forecasting process is trend-based, which means that relative popularity, intake patterns, and inward migration factors from the previous five years are assumed to continue throughout the forecasting period. Migration factors will reflect the trend-based level of house-building in an area over the previous five years, but also the general level of in and out migration, including movements into and out of existing housing. An area that has a large positive migration factor may be due to recent large-scale housebuilding, and an area with a large negative migration factor may reflect a net outmigration of families. These migration factors are calculated at pre-school level by ward area and also at school level for transition between year groups, as the forecasts are progressed.

8.5 Information about expected levels of new housing, through the yearly Housing Information Audits (HIA) and Local Development Framework (LDF) Core Strategies is the most accurate reflection of short, medium and long term building projects at the local level. Where a large development is expected, compared with little or no

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previous housing-building in the area, a manual adjustment to the forecasts may be required to reflect the likely growth in pupil numbers more accurately.

8.5 Pupil product rates (the expected number of pupils from new house-building) are informed by the MORI New Build Survey 2005. KCC has developed a system that combines these new-build pupil product rates (PPRs) with the stock housing PPR of the local area to model the impact of new housing developments together with changing local demographics over time. This information is shared with District authorities to inform longer term requirements for education infrastructure and the Community Infrastructure Levy (CIL) discussions at an early stage.

8.6 Forecasting future demand for school places can never be completely precise given the broad assumptions which have to be made about movements in and out of any given locality, the pace of individual developments, patterns of occupation and not least the parental preference for places at individual schools. This will be a function of geography, school reputation, past and present achievement levels and the availability of alternative provision.

…

8.8 Over the last five years the forecasts for the Primary school roll in Kent have been accurate to within one percent on 19 of these 25 points of comparison

…

8.10 The Secondary forecasts have been accurate to within 1% on 16 of the 20 points of comparison, with three points of the 2010-based outputs being over forecast

Portsmouth

5. Current pupil place forecasting methodology

5.1 Sources of data

Actual numbers for pupil data are derived from the School Census. The schools produce this information from their Management Information Systems, using guidance provided by the Department for Education with support from the Local Authority.

Pupil forecasts are based upon Small Area Population Forecasts (SAPF) provided by Hampshire County Council Research and Intelligence group in the early spring of each year to determine the population of 4 year old children. These are modified within Portsmouth City Council Geographical Information System (GIS) to reflect primary school catchment areas. Information on new/demolished buildings is obtained from the City Planning Department when forecasting numbers for individual primary school catchments.

Actual and forecast numbers of pupils from the primary forecasts are fed into the secondary forecasts.

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In the past the SAPF forecasting model has been highly accurate, at a time when there has been significant surplus capacity within the system to meet the level of demand. Since 2010 this has not been the case due to the impact of increased birth rates both nationally and locally and a number of other economic and social factors that the current forecasting model has not been able to predict.

It is therefore recommended that a 'Social / Economic allowance factor' be built into future forecasting methods to make an allowance for the increased demand against forecast that has been seen in both 2011 and 2012 pupil numbers. This should be continuously reviewed to ensure future pupil numbers are adequately planned for.

The factor applied is based upon a 3 year weighted average of the difference between original forecasts and Actual Year R pupil numbers.

Discussions are continuing with neighbouring authorities and the forecasting methodology will continue to be reviewed to ensure that any predicted change in pupil numbers is captured early to allow for adequate planning of school places

5.2 How the raw data is processed to arrive at final figures

Forecasting at the primary and secondary aggregate level, as given here, is based on the cohort survival method that assumes pupil numbers will roll forward from one year group to the next at the end of each academic year. Year on year changes, which may be influenced by such factors as migration, turbulence, demographic and building changes, are projected forward by using a 5-year weighted average.

The general SAPF model produces forecasts of the usually resident population by age and sex in each Census Output Area (OA) in the City and is based on: census; birth and child health data; and dwelling supply information.

5.3 Primary forecasts

At the individual school level, the primary forecasting system collects the number of 4-year olds within the boundaries of each school's catchment for forecasting. Using data from the historical school censuses, the participation rate (PR) is worked out for each year. The level of participation (as a percentage) is then used to project forward using a 5 year weighted average, adjusted for residuals, to give the expected number of 4-year olds on roll in future years.

The expected numbers of 7 year olds transferring into Junior schools are calculated similarly, using the number of Year 6 pupils in the feeder schools and applying an adjusted 5 year weighted average participation rate.

For other year groups, the adjusted 5 year weighted average year-on-year change is applied to each cohort as it is rolled forward and modified to take account of past and expected changes to dwelling stock in the catchment.

5.4 Secondary forecasts

At the aggregate level, as with the primary sector, secondary pupil forecasts are based on 5 year weighted average participation rates based on actual (School Census) and forecast numbers from the primary sector.

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With the advent of catchment areas within the Local Authority for the first time in 1999, *individual school forecasts* are now also derived from Geographical Information Systems (GIS) analysis of primary aged pupils living within each school's catchment. This data is adjusted for pupil inputs (e.g. from neighbouring Local Authorities) and outputs (e.g. to other Local Authorities and losses to the independent sector). The values of these various inputs and outputs are derived from analysis of the Secondary Transfer Database which contains details of pupils applying to LA and other secondary schools.

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Appendix C: The Consultant

Andrew Hind was a senior officer reporting directly to the Chief Education Officer/Director of Children's Services in two unitary authorities (Reading and Southampton). He has undertaken extended consultancy assignments in relation to school organisation, including validating school forecasting systems, in several authorities including Essex County Council (10 months) and Kent County Council (15 months).

He was awarded an MSc in Demography with Distinction in 2014 by the University of Southampton, and is now a PhD candidate at the same university, researching the impact of education on internal migration in the UK. He is an Associate Member of the Association of Directors of Children's Services, and a Fellow of the Royal Statistical Society.