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School Pupil Product Ratio Review
Ath-sgrùdadh Co-mheas Toradh Sgoileir

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Introduction

Each year, the Highland Council undertakes a forecasting exercise to predict future roll pressures on schools due to new housing and other factors. As part of the current School Roll Forecasting (SRF) methodology, planned new housing developments are expected to yield an average number of Primary and Secondary pupils into the local schools. These Pupil Product Ratio (PPR) values are one of the key forecasting data inputs and are therefore checked periodically for accuracy.

Previously, the PPR values used across the Highlands for forecasting purposes were 0.3 pupils per household for Primary aged children, and 0.13 pupils per household for Secondary aged children. These figures were in line with those used by other local authorities and were validated for use in the Highlands by a study conducted in September 2017, which assessed the impact of significant new house building within the previously sparsely populated Milton-of Leys (MOL) area.

This review endeavoured to expand on the original MOL study by assessing the effects of new housing from multiple areas across the whole of the Highlands.

Objectives

There were four targeted objectives for this study :

1. Review and update the existing Highland-wide Pupil Product Ratios used in School Roll Forecasting, previously set at 0.3 pupils per household for Primary aged children and 0.13 pupils per household for Secondary aged children
2. Quantify the attractiveness of new housing over the 15 year forecast period and verify the use of an average Pupil Product Ratio to accurately represent any growth curve observed during the site build period
3. Review and update the Year Group Weightings, which further break down the Pupil Product Ratios to give the distribution of pupils in each age range
4. For the first time, produce a range of PPR values that were specific to smaller areas of the Highland, improving accuracy in more rural locations

Methodology

A new dataset was created by combining extracts from the Corporate Address Gazetteer (CAG) with Council Tax data to show when newly constructed houses were first registered for Council Tax. To give a clearer picture of the effects of the new housing without being distorted by existing housing stock, a subset of the new data was selected to provide only postcodes with near zero housing prior to 2008, and only those where all new house building was completed by 2017 so that their peaks and declines in popularity could be accurately tracked beyond the construction period. The data was organised by construction year rather than calendar year, so the first year of house building for each site would be 'Year 1' regardless of actual year of construction.

The 'New Postcodes' dataset contained over 4,500 houses built in 48 different postal districts (eg, IV3, PH33 etc), distributed across the following Highland areas :

Highland Areas	Postal Districts	New Houses
Badenoch and Strathspey	6	180
Caithness	3	112
East Ross *	5	340
Inverness	6	2400
Lochaber	5	214
Mid Ross *	7	637
Nairn	1	192
Ross and Cromarty West *	5	55
Skye and Lochalsh	6	241
Sutherland	5	135
Grand Total	49	4506

* 'East Ross', 'Mid Ross' and 'Ross and Cromarty West' are combined to form a single region for forecasting purposes

The 'New Postcodes' subset was then combined with anonymised historic pupil data to show how attractive the new houses were to young families, the average numbers of Primary or Secondary pupils per new house and the length of time the new houses remained attractive before these elevated PPR's declined to baseline levels of surrounding housing stock.

Conclusions

The four objectives for this review were addressed as follows :

1. Review Average PPR values - The previously used Highland wide Product Pupil Ratios of 0.3 pupils per house for Primary and 0.13 for Secondary were the result of a study focussed on the significant housing development in Milton-of-Leys. This latest study takes account of a wider range of house building from across the Highlands. As a result, the new PPR for Primary aged pupils will be a lower average of 0.24 pupils per household and the revised PPR for Secondary pupils will increase slightly to 0.14.

2. Research growth curve – It would be technically possible to apply a growth curve to every site as part of the forecasting methodology, whereby a gradual increase in pupils from year one reaches a peak in pupil numbers, then slowly declines as each new housing site becomes established. However, this is currently too processor intensive and does not yield any significant benefit over the currently employed average PPR values for most housing sites. For large scale housing sites, the growth curve effect can be achieved by altering PPR rates during the various phases of construction until advances in technology allow for more sophisticated modelling.

3. PPR by Year Group (PPR Weightings) – The study confirmed that housing developments are more attractive to new families than existing families. The revised weightings at Highland level will therefore be based on a reducing scale from 0.038 pupils per household for P1 aged pupils, down to 0.012 for S6 aged pupils :

P1	P2	P3	P4	P5	P6	P7	S1	S2	S3	S4	S5	S6
0.038	0.039	0.037	0.035	0.036	0.033	0.031	0.029	0.028	0.025	0.023	0.018	0.012

4. PPR by Geographic Area – The School Roll Forecasting system is already capable of applying different PPR values to different geographical areas, but previously there has been insufficient data to provide the appropriate values to use. This study was able to confirm individual PPR values for each of these HC Areas :

Highland Areas	Primary	Secondary
Badenoch and Strathspey	~~0.17~~	~~0.12~~
Inverness	~~0.26~~	~~0.13~~
Nairn	~~0.23~~	~~0.09~~
Sutherland	~~0.17~~	~~0.07~~
Skye and Lochalsh	~~0.29~~	~~0.19~~
Caithness	~~0.21~~	~~0.16~~
Lochaber	~~0.22~~	~~0.13~~
Ross and Cromarty (combined)	~~0.27~~	~~0.17~~

All these new input values will be applied to future School Roll Forecasts, starting with the 2022/23 forecast.

ADDENDUM

Since this study was completed, additional Housing and Pupil data has allowed the original Pupil Product Ratios to be refreshed. The latest values currently in use are as follows :

Highland Areas	Primary	Secondary
Badenoch and Strathspey	0.17	0.12
Inverness	0.25	0.14
Nairn	0.24	0.09
Sutherland	0.17	0.07
Skye and Lochalsh	0.29	0.19
Caithness	0.21	0.16
Lochaber	0.22	0.13
Ross and Cromarty (combined)	0.20	0.12