Business Intelligence Report

Using Household Level Address Data and the School Census to Calculate Pupil Product Ratios (Draft)

February 2020

Introduction

Pupil Product Ratios (PPR) are defined as the average number of children per dwelling requiring school places. PPRs are used to inform the amount of developer contributions requested under Section 106 Town and Country Planning Act 1990, in order to support new school build capital programmes. PPRs are also required to support the evidence base for pupil forecasts within the school commissioning plan.

KCC commissioned previous research in 2005/06 to MORI to identify PPRs within new build dwellings. As this research was carried out over ten years ago, Strategic Commissioning Analytics were requested to complete new research to examine whether PPRs have changed over time.

This brief report describes a desk-based approach that has been developed by SCA to assess the PPR in new housing developments. The methodology used is described and the calculated PRRs presented.

Methodology

Identifying new addresses/properties

Experian have provided KCC with an annual household directory from 2014 onwards. This forms part of the contract for address matching software and customer segmentation data that KCC currently has in place with Experian. This contains a list of all households in Kent alongside unique reference numbers such as the UDPRN (Unique Delivery Point Reference Number) used by Royal Mail. 100% of addresses in the household directory have a UDPRN reference, so this was used for matching purposes.

The UDPRN allows a comparison to be made across the annual datasets to identify new addresses, including major developments, conversions and single infill dwellings.

New addresses between February 2014 and February 2019 were used for the research.

Whilst the household directory provided by Mosaic was used for this methodology, any consistent address data could be used such as the Postcode Address File (PAF) and NLPG (National Land and Property Gazetteer) which are available under the Public Sector Mapping Agreement (PSMA).

Identifying New Large-Scale Developments

Once new addresses were identified, an analysis of the postcodes in which the new properties/addresses were located was carried out. If the postcode contained 10 or more new properties/addresses and these accounted for 80%+ of all properties/addresses in the postcode then it was included in the analysis of new developments. This process was used to identify large new developments which may be subject to Section 106 legislation, as opposed to infill developments which have a different demographic profile.

The lower super output area (LSOA) was then appended to the postcodes which were located in significant new developments. The LSOA was then used to identify the name of the site from data provided by the district councils across Kent. An example of these sites is shown in table 2.

Table 2: Example of Identified Sites/Developments

Postcode	LSOA Name	Major Site	Site	District	2014 Addresses	2019 Addresses	% New Addresses in Postcode	80%+ New Developments
DA12FA	Dartford 003A	Arjo Wiggins		Dartford	0	66	100.0%	Yes
CT149WG	Dover 005B	Land NE of Sandwich Road,	14-16 Church Lane, Deal	Dover	10	66	84.8%	Yes
TN23FP	Tunbridge Wells 003B	Land West Of Kings Way		Tunbridge Wells	0	36	100.0%	Yes

Matching Pupils to New Addresses

The October 2019 school census contains address information for children attending KCC state funded schools. Address matching software iCoder, provided by Experian was used to assign a UDPRN (Unique Delivery Point Reference Number) to each individual pupil record.

Of the 239,460 pupils in the October 2019 school census, 208,936 (87.3%) were coded with a UDPRN by iCoder. For the remaining 30,524 (12.7%) of pupils, those who lived in a postcode in which there were 10 or more new addresses added between 2014-2019 were identified. There were 1,903 pupils that met this criterion. Of these, 1,389 were matched to an address in the 2019 Household Directory using fuzzy matching in excel, 349 were manually matched to an address and 164 were pupils were excluded. This was because these pupils lived in households that were not recorded in the Household Directory file from February 2019 (i.e. new completions from March 2019 to October 2019).

There were 28,621 pupils in October 2019 school census that were not assigned a UDPRN during this process. However, they lived in postcodes in which less than 10 new addresses were created between 2014-2019 and therefore did not affect the PPR calculations, so were not examined further.

Calculating the Pupil Product Ratio for the New Developments

Postcodes in which 10 or more addresses were added between 2014-2019, and where these addresses accounted of 80% of all properties in the postcode were then identified for inclusion for the Pupil Product Ratio analysis. These criteria were used as identifying the individual property type for small sites was considered to be time consuming and possibly inaccurate, and developer contributions are only requested for larger sites.

To provide comparison to previous MORI work analysis needed to be provided by dwelling type – houses and flats.

A property type of 'housing', 'flats' or 'mixed' was applied to each postcode using a mixture of Postcode Finder/Zoopla/Right Move and Google Maps to gather information on the postcode.

Figures 1, 2 and 3 show how this information can be used to assign a predominant property type to each postcode.

New developments which were found to contain retirement living, student flats or mobile homes were excluded from further analysis as part of this categorisation of post codes.

Having identified post code units which had 10 or more new dwellings (representing 80% of all addresses), and which were not excluded for reasons stated above, the PPRs could be calculated. The October 2019 school census (excluding pupils living in new addresses) was then analysed to ascertain the number of primary and secondary pupils living in each postcode identified for inclusion in the PPR analysis. The number of primary, secondary and SEN pupils was then divided by the total number of addresses in each postcode area to arrive at a PPR.

Figure 1: Zoopla Data for DA1 5GU

5 Moonlight Mile House, Stones Avenue, DA1 5GU

🛏 2 🛁 2 🛋 1   Flat   Leasehold

Estimate: **£222k - £246k**   Last sale - Jul 2018 £237,000   Book an agent valuation

6 Moonlight Mile House, Stones Avenue, DA1 5GU

Flat   Leasehold

Estimate: **£168k - £206k**   Last sale - Mar 2017 £188,000   Book an agent valuation

7 Moonlight Mile House, Stones Avenue, DA1 5GU

🛏 2 🛁 1 🛋 1   Flat   Leasehold

Estimate: **£219k - £243k**   Last sale - Jun 2017 £225,000   Book an agent valuation

8 Moonlight Mile House, Stones Avenue, DA1 5GU

🛏 2 🛁 2 🛋 1   Flat   Leasehold

Estimate: **£217k - £240k**   Last sale - Aug 2018 £234,000   Book an agent valuation

Figure 2: Postcode Finder Data for CT10 2DE

Figure 3: Google Maps Data for DA1 5GU
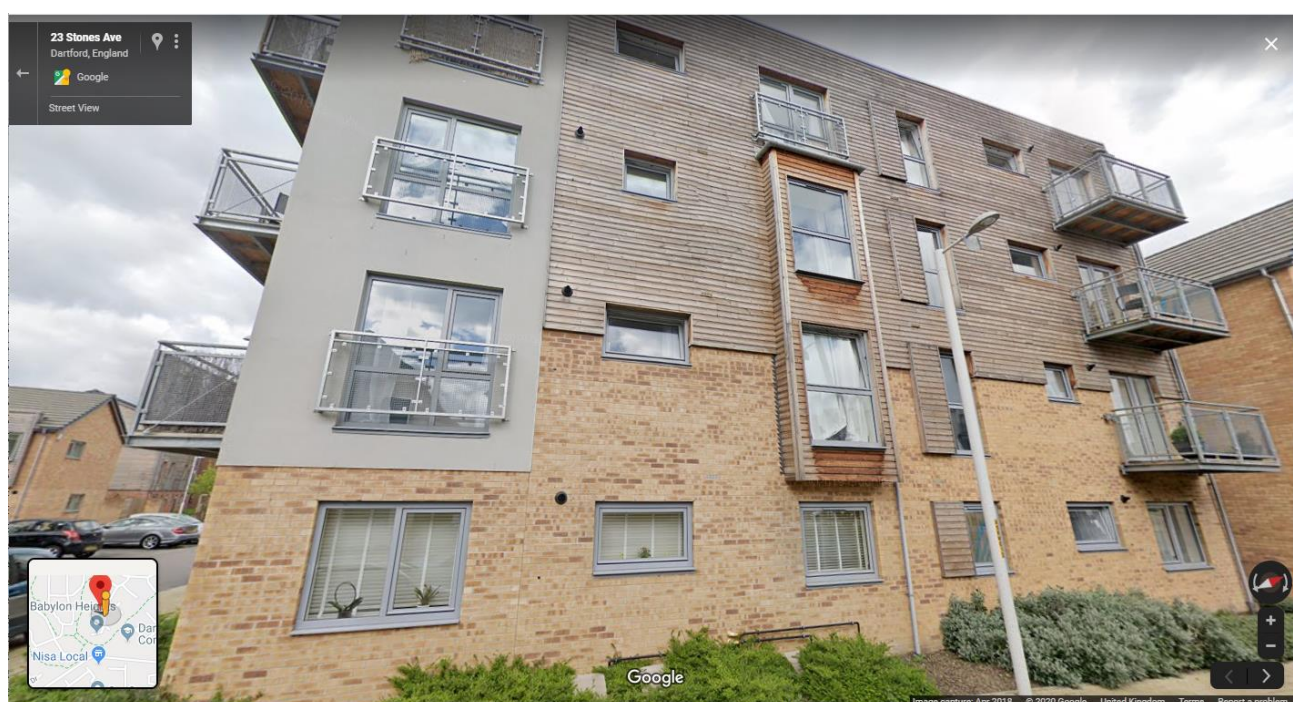
Analysis

<u>Pupil Product Ratio for New Address 2014-2019</u>

The Pupil Product Ratio across all new properties built between 2014 and 2019 was **0.29** for primary pupils (Year R -Year 6) and **0.14** for secondary pupils (Year 7 – Year 13). The PPR for special school pupils in years R-13 is **0.01.** However, there was a significant variation in the PPR by accommodation type. The PPR for secondary pupils (Year 7-11) is **0.12** (variation by district is available in the annexe).
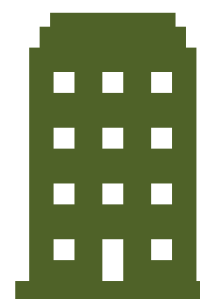
Housing	Mixed (Housing & Flats)	Flats
Primary 0.38	Primary 0.29	Primary 0.11
Secondary 0.18	Secondary 0.14	Secondary 0.05
Special School 0.01	Special School 0.01	Special School 0.004

Table 3 shows the variation in the PPR by district for new properties built between 2014 and 2019. This shows a significant variation in the PPR. Sevenoaks has a primary PPR of 0.19, whilst Maidstone has a primary PPR of 0.35. However, as table 4 shows, this relates to the property type of new developments in each district. For example, 54.6% of new dwellings in Sevenoaks between 2014 and 2019 were flats.

Table 3: Pupil Product Ratio (2014-2019), by District

District	Households in New Developments (2015-2019)	Oct 2019 Primary Puils (Year R - Year 6) Mainstream	Oct 2019 Secondary Puils (Year 7 - Year 13) Mainstream	Oct 2019 Special School Pupils (Year R - Year 13)	Oct 2019 Primary Puils (Year R - Year 6) Mainstream PPR	Oct 2019 Secondary Puils (Year 7 - Year 13) Mainstream PPR	Oct 2019 Special School Pupils (Year R - Year 13) PPR
Ashford	1,667	451	215	10	0.27	0.13	0.01
Canterbury	468	139	63	6	0.30	0.13	0.01
Dartford	3,295	1,026	377	8	0.31	0.11	0.00
Dover	1,086	359	201	9	0.33	0.19	0.01
Folkestone & Hythe	848	196	134	10	0.23	0.16	0.01
Gravesham	442	111	71	2	0.25	0.16	0.00
Maidstone	2,478	832	410	46	0.34	0.17	0.02
Sevenoaks	722	135	51	3	0.19	0.07	0.00
Swale	1,393	480	233	16	0.34	0.17	0.01
Thanet	638	151	72	8	0.24	0.11	0.01
Tonbridge and Malling	2,229	563	275	19	0.25	0.12	0.01
Tunbridge Wells	687	176	97	3	0.26	0.14	0.00
Total	15,953	4,619	2,199	140	0.29	0.14	0.01

Table 4: Dwelling Classification of New Developments (2014-2019), by District

District	Property Type of New Developments (2015-2019)			
	Flats	Housing	Mixed	Total
Ashford	20.8%	55.5%	23.8%	100.0%
Canterbury	41.5%	53.8%	4.7%	100.0%
Dartford	22.2%	55.2%	22.6%	100.0%
Dover	5.9%	85.5%	8.7%	100.0%
Folkestone & Hythe	14.7%	52.5%	32.8%	100.0%
Gravesham	34.6%	31.7%	33.7%	100.0%
Maidstone	27.7%	43.9%	28.4%	100.0%
Sevenoaks	54.6%	42.5%	2.9%	100.0%
Swale	16.1%	63.2%	20.7%	100.0%
Thanet	36.4%	42.9%	20.7%	100.0%
Tonbridge and Malling	29.0%	36.7%	34.3%	100.0%
Tunbridge Wells	26.9%	57.5%	15.6%	100.0%
Total	25.0%	51.8%	23.2%	100.0%

Table 5 shows the Pupil Product Ratios by district for housing, as opposed to all property types. This shows a more consistent PPR by district with all districts having Primary Pupil Product Ratio of over 0.3, with the exception of Tunbridge Wells. There is also variation in the PPR across the large new developments in Kent. Summary tables are available in the annexe.

Table 5: PPR for Housing in New Developments (2014-2019) by District

District	Households in New Developments (2015-2019)	Oct 2019 Primary Puils (Year R - Year 6) Mainstream	Oct 2019 Secondary Pupils (Year 7 - Year 13) Mainstream	Oct 2019 Special School Pupils (Year R - Year 13)	Oct 2019 Primary Pupils (Year R - Year 6) Mainstream PPR	Oct 2019 Secondary Puils (Year 7 - Year 13) Mainstream PPR	Oct 2019 Special School Pupils (Year R - Year 13) PPR
Ashford	925	304	154	8	0.33	0.17	0.01
Canterbury	252	106	48	5	0.42	0.19	0.02
Dartford	1,818	787	274	3	0.43	0.15	0.00
Dover	928	325	185	8	0.35	0.20	0.01
Folkestone & Hythe	445	119	87	7	0.27	0.20	0.02
Gravesham	140	42	24	0	0.30	0.17	0.00
Maidstone	1,088	496	279	30	0.46	0.26	0.03
Sevenoaks	307	109	44	3	0.36	0.14	0.01
Swale	880	373	180	11	0.42	0.20	0.01
Thanet	274	78	43	3	0.28	0.16	0.01
Tonbridge and Malling	819	286	126	7	0.35	0.15	0.01
Tunbridge Wells	395	113	72	1	0.29	0.18	0.00
Total	8,271	3,138	1,516	86	0.38	0.18	0.01

Comparison with previous MORI work

The results from this latest research are compared to the results reported by MORI in 2005 in table 6 below.

Table 6: PPR Comparisons: IPSOs MORI 2005 & Strategic Commissioning Analytics 2020

Puipil/Housing Type	IPSOS MORI 2005	Strategic Commissioning Analytics 2020	Change
Primary (Year R - Year 6)			
Houses	0.37	0.38	0.01
Flats	0.04	0.11	0.07
Secondary (Year 7 - 13)			
Houses	0.27	0.18	-0.09
Flats	0.03	0.05	0.02

The Strategic Commissioning Analytics results show an increase for all PPRs across all dwelling types, except secondary school age children in houses which has shown a significant decrease.

However, the MORI work included all children whereas the Strategic Commissioning Analytics work has examined state school pupils and excludes those pupils who attend colleges. This therefore suggests that PPRs have increased by more than the above numbers suggest.

Increases in PPR can be explained by the recent baby boom with a large increase in primary school age children over the last decade, with birth rates continuing to remain high relative to the position a decade ago.

Pre School Pupil Product Ratio

In addition to refreshing the methodology of Pupil Product Ratio's for school pupils, the Analytics team were also asked to calculate PPR for 2,3 & 4 year olds that access funded childcare places. The vast majority of 3 & 4 year olds accessing childcare within KCC are entitled to 15 or 30 hours of funded childcare per week, whilst for 2 year olds this is limited to those with a disability, SEN or where parents are in receipt of particular benefits. In Kent the scheme is known as Free for 2.

Headcount data is collected termly by Management Information for all funded childcare places. This data contains information on the child's home address, alongside their childcare setting and hours claimed. In order to calculate the PPR's for 2, 3 & 4 year olds accessing funded childcare places in new developments, the number of children in each postcode for the cohorts were matched to the postcodes in new developments as described earlier in this report. The PPR's calculated were **0.09** for funded 3 & 4 year olds and **0.01** for 2 year olds accessing a Free for 2 place.

Housing	**Mixed (Housing & Flats)**	**Flats**
3 & 4 Year Olds - 0.107	3 & 4 Year Olds - 0.101	3 & 4 Year Olds - 0.045
Free for 2 - 0.009	Free for 2 - 0.014	Free for 2 - 0.010

Impact on Developer Contributions

The IPSOS Mori research was adapted by KCC to arrive at the following Pupil Product Ratio's that are applied to developer contributions. The table below compares this to the PPR's calculated in this analysis. This shows a significant shortfall in the contribution for primary school places under the current guidance.

Table 7: PPR Comparisons: Current KCC Guidance and Strategic Commissioning Analytics 2020

Puipil/Housing Type	Current KCC PPRs	Strategic Commissioning Analytics 2020	Change
Primary (Year R - Year 6)			
Houses	0.28	0.38	0.10
Flats	0.07	0.11	0.04
Secondary (Year 7 - 13)			
Houses	0.20	0.18	-0.02
Flats	0.05	0.05	0.00
SEN			
Houses	0.016	0.010	-0.01
Flats	0.004	0.004	0.00

The current methodology would generate £10,300 in developer contributions for education for each new build house, whilst the Strategic Commissioning Analytics rates would generate £11,047, a 7.3% increase. This is shown in table 8.

The current methodology would generate £3,082 in developer contributions for education for each new build flat, whilst the Strategic Commissioning Analytics rates would generate £4,019, a 30.4% increase. This is also shown in table 8.

Table 8: Impact of Proposed Change on Contributions per New House/Flat

School Place	Assumed Costs (New Builds)
Primary School	£16,198
Secondary School	£23,434
SEN	£67,379

	Strategic Commissioning Analytics 2020	Developer Contribution Guide	Strategic Commissioning Analytics 2020	Developer Contribution Guide
	Proposal	What we ask for now	Proposal	What we ask for now
Primary	**PPR**		**Cost per New Build**	
Houses	0.38	0.28	£6,155	£4,535
Flats	0.11	0.07	£2,578	£1,640
Secondary				
Houses	0.18	0.20	£4,218	£4,687
Flats	0.05	0.05	£1,172	£1,172
SEN				
Houses	0.01	0.016	£674	£1,078
Flats	0.004	0.004	£270	£270

	Total Contribution	
	Proposal	What we ask for now
House	£11,047	£10,300
Flat	£4,019	£3,082

Annexe

Figure 1: Secondary (Year 7 – 11) Pupil Product Ratio (2014-2019) – All Addresses

District	Households in New Developments (2015-2019)	Oct 2019 Secondary Puils (Year 7 - Year 11) Mainstream	Oct 2019 Secondary Puils (Year 7 - Year 11) Mainstream PPR
Ashford	1,667	182	0.11
Canterbury	468	60	0.13
Dartford	3,295	339	0.10
Dover	1,086	165	0.15
Folkestone & Hythe	848	117	0.14
Gravesham	442	58	0.13
Maidstone	2,478	377	0.15
Sevenoaks	722	44	0.06
Swale	1,393	209	0.15
Thanet	638	69	0.11
Tonbridge and Malling	2,229	242	0.11
Tunbridge Wells	687	87	0.13
Total	15,953	1,949	0.12

Figure 2: Secondary (Year 7 – 11) Pupil Product Ratio (2014-2019) – Housing

District	Households in New Developments (2015-2019)	Oct 2019 Secondary Puils (Year 7 - Year 11) Mainstream	Oct 2019 Secondary Puils (Year 7 - Year 11) Mainstream PPR
Ashford	925	132	0.14
Canterbury	252	46	0.18
Dartford	1,818	250	0.14
Dover	928	151	0.16
Folkestone & Hythe	445	76	0.17
Gravesham	140	22	0.16
Maidstone	1,088	254	0.23
Sevenoaks	307	39	0.13
Swale	880	160	0.18
Thanet	274	39	0.14
Tonbridge and Malling	819	116	0.14
Tunbridge Wells	395	66	0.17
Total	8,271	1,351	0.16

Figure 3: Secondary (Year 7 – 11) Pupil Product Ratio (2014-2019) – Flats

District	Households in New Developments (2015-2019)	Oct 2019 Secondary Puils (Year 7 - Year 11) Mainstream	Oct 2019 Secondary Puils (Year 7 - Year 11) Mainstream PPR
Ashford	346	9	0.03
Canterbury	194	13	0.07
Dartford	733	37	0.05
Dover	64	5	0.08
Folkestone & Hythe	125	1	0.01
Gravesham	153	5	0.03
Maidstone	687	26	0.04
Sevenoaks	394	4	0.01
Swale	224	15	0.07
Thanet	232	6	0.03
Tonbridge and Malling	646	33	0.05
Tunbridge Wells	185	3	0.02
Total	3,983	157	0.04

Figure 4: PPR's for 10 Largest Major Sites – Housing

Major Site	Households in New Developments (2015-2019)	Oct 2019 Primary Puils (Year R - Year 6) Mainstream	Oct 2019 Secondary Puils (Year 7 - Year 13) Mainstream	Oct 2019 Special School Pupils (Year R - Year 13)	Oct 2019 Primary Puils (Year R - Year 6) Mainstream PPR	Oct 2019 Secondary Puils (Year 7 - Year 13) Mainstream PPR	Oct 2019 Special School Pupils (Year R - Year 13) PPR
The Bridge	714	280	87	2	0.39	0.12	0.00
Former GSK, East Site (NGE)	514	261	76	0	0.51	0.15	0.00
Land NE of Sandwich Road,	384	140	89	7	0.36	0.23	0.02
Park Farm	358	105	38	4	0.29	0.11	0.01
Aylesham Village	356	130	71	1	0.37	0.20	0.00
Castle Hill, Eastern Quarry	249	87	26	1	0.35	0.10	0.00
Iwade	196	86	33	5	0.44	0.17	0.03
Land West Of Kings Way	169	44	27	0	0.26	0.16	0.00
East Hall Farm, Sittingbourne	155	56	23	0	0.36	0.15	0.00
West Kent Cold Store, Rye Lane	151	48	17	2	0.32	0.11	0.01
Land At Langley Park, Sutton Road	136	31	18	4	0.23	0.13	0.03
Isles Quarry	106	46	16	1	0.43	0.15	0.01
Total	3488	1314	521	27	0.38	0.15	0.01