

Office for Fair Access (OFFA) Access Agreement 2017-18: Re-evaluation of admissions target for maintained school pupils

Summary

- In the collegiate University's 2016-17 Access Agreement with the Office for Fair Access (OFFA), we set a target for our proportion of admissions from maintained (i.e. state) sector schools of 64%, aiming to reach this by 2019-20. The research findings summarised here were based on recent data from 2014 and 2015, and informed the collegiate University's decision to retain an ultimate target of 64% in the 2017-18 Access Agreement.
- We found that Cambridge applicants from maintained schools had higher offer and acceptance rates for Arts subjects than their independent school counterparts when A Level attainment was taken into account, as did maintained school applicants for Science subjects (excluding Mathematics, which is a special case) if they attained A*A*A or lower. However, maintained school applicants for Science subjects that attained A*A*A* or higher had lower offer and acceptance rates than their independent school counterparts.
- The attrition rate (i.e. the rate at which offer-holders failed to convert into acceptances) was typically higher, or equal, for offer-holders (for Science and Arts subjects) from maintained schools compared to their independent school counterparts.
- An appropriate target proportion of admissions from maintained sector schools was estimated, taking into account the banded A Level attainment of successful Cambridge applicants; the typical proportions of students in each A Level attainment band that attended maintained schools, either for all A Level students nationally, or just for Cambridge applicants; and, where possible, the type of subject applied for (Arts, Science, Mathematics). After appropriate adjustments, the target estimate was that up to 61.8% of admissions should be of students attending maintained schools (based on national attainment proportions); if this was based on Cambridge applicant attainment proportions instead, the target estimate was lower (up to 61.1%).
- Although these estimated targets were below the ultimate target of 64% in the collegiate University's 2016-17 Access Agreement, it was decided to retain this as a stretching target in the latest 2017-18 Access Agreement, starting with a milestone of 62% in the first year.

Introduction

In the collegiate University's 2016-17 Access Agreement with the Office for Fair Access (OFFA)¹, we set a target for our proportion of admissions from maintained (or state) sector schools of 64%, aiming to reach this by 2019-20. That target was based in part on 2012 national attainment data from a statistical report published by Cambridge Assessment in 2013². This paper details our re-evaluation of our admissions target using more recent publically available data from Cambridge Assessment on national A Level attainment³, in conjunction with internal Cambridge data. The research presented here informed the collegiate University's decision to retain an ultimate target of 64% in its 2017-18 Access Agreement⁴.

Data parameters

For the purpose of these analyses, all UK schools that were not classified as "Independent" were classified as "Maintained", which is consistent with Higher Education Statistics Agency (HESA)'s definition for Performance Indicators⁵.

The national attainment data from Cambridge Assessment summarised data extracted from the Department for Education's National Pupil Database⁶. These national data excluded a small number of students for whom school type was unknown, and Cambridge data excluded a small number of applicants for whom school type was classified as "Other or Overseas". National data encompassed A Level students in English schools only, whereas Cambridge data were restricted to "Home" undergraduate applicants, defined as UK nationals permanently resident in the UK⁷. National data were only available for pupils who turned 18 in the academic year when their A Levels were taken, as the majority do. National A Level data for 2014 corresponded to A Levels that were taken in the 2013-14 academic year, whilst Cambridge data for 2014 corresponded to Universities and Colleges Admissions Service (UCAS) applicants in the 2013-14 cycle. Because applicants most typically apply through UCAS in the same year that they take A Levels, the majority of students counted as 2014 A Level-takers would also be 2014 UCAS applicants.

General Studies and Critical Thinking A Levels were not included in Cambridge or national A Level attainment profiles. Additionally, Thinking Skills A Level and any A Levels taken before Summer 2010 (when A*s were first awarded) were not included in Cambridge attainment profiles. Students with less than 3 A Levels included in their attainment profiles were included in data concerning overall

¹ <https://www.offa.org.uk/>

² N. Zanini, 2013, *Candidates awarded the A* grade at A-level in 2012*, Statistical Report Series No. 53, Cambridge Assessment.

³ T. Gill, 2015, *Candidates awarded the A* grade at A-level in 2014*, Statistical Report Series No. 92, Cambridge Assessment.

⁴ University of Cambridge, 2016, *Access Agreement with the Office for Fair Access (OFFA) 2017-2018* <https://www.offa.org.uk/agreements/University%20of%20Cambridge%201718.pdf>

⁵ https://www.hesa.ac.uk/index.php?option=com_content&view=article&id=2379#school

⁶ <https://www.gov.uk/government/collections/national-pupil-database>

⁷ This is consistent with the University's published Undergraduate Admissions Statistics.

Cambridge applications, offers and acceptances (Tables 1 and 2), but were not included in any of the other Cambridge or national data, which were broken down by A Level attainment.

Cambridge applications, offers and acceptances by school type

As a first step, the recent numbers and proportions of Cambridge applications, offers and acceptances attributed to maintained and independent school students in the last 3 cycles were summarised (Table 1 and Figure 1).

	APPLICATIONS			OFFERS			ACCEPTANCES		
	2013	2014	2015	2013	2014	2015	2013	2014	2015
Maintained	6226	6291	6264	1830	1914	1964	1524	1553	1564
Independent	2827	2825	2728	1102	1053	1062	958	944	943
Maintained %	68.8	69.0	69.7	62.4	64.5	64.9	61.4	62.2	62.4
Independent %	31.2	31.0	30.3	37.6	35.5	35.1	38.6	37.8	37.6

Table 1: Number and percentage of Cambridge applications, offers and acceptances, by year and school type.

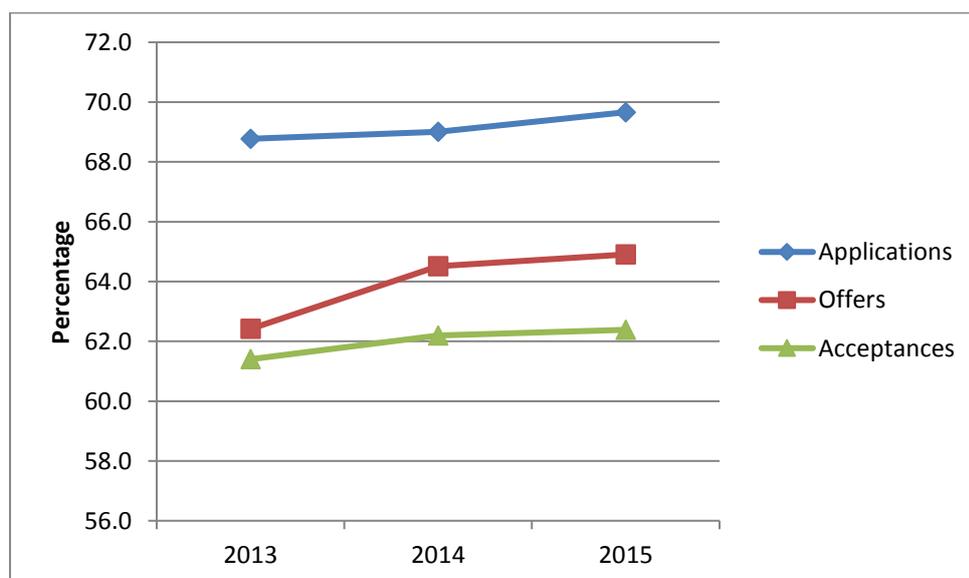


Figure 1: Percentage of Cambridge applications, offers and acceptances that were attributed to maintained school students, by year.

The percentage of Cambridge offers achieved by maintained school applicants was at its lowest in 2013 (i.e., application year 2012-13) (62.4%), and has since risen to 64.9% in 2015. In a similar vein, the percentage of Cambridge acceptances achieved by maintained school applicants was at its lowest in 2013 (61.4%), and has since risen to 62.4% in 2015.

Based on these data, offer and acceptance rates were calculated (Table 2, Figures 2 and 3). The offer rate for maintained school applicants was lowest in 2013 (29.4%), and has since risen to 31.4% (2015). Similarly, the acceptance rate for maintained school applicants was lowest in 2013 (24.5%), and has since risen to 25.0%.

	OFFER RATE			ACCEPTANCE RATE		
	2013	2014	2015	2013	2014	2015
Maintained	29.4	30.4	31.4	24.5	24.7	25.0
Independent	39.0	37.3	38.9	33.9	33.4	34.6

Table 2: Offer rate (percentage of applicants receiving an offer) and acceptance rate (percentage of applicants ultimately accepted) of Cambridge applicants, by year and school type.

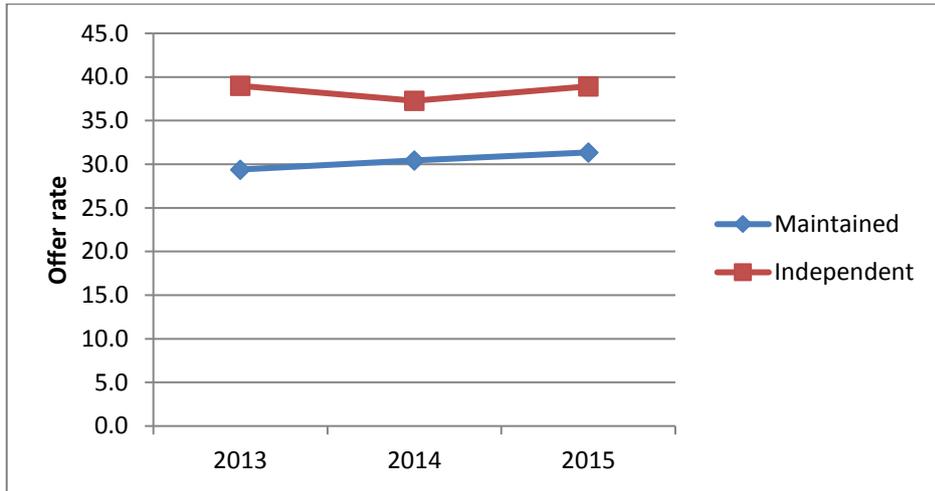


Figure 2: Offer rate (percentage of applicants receiving an offer) of Cambridge applicants, by year and school type.

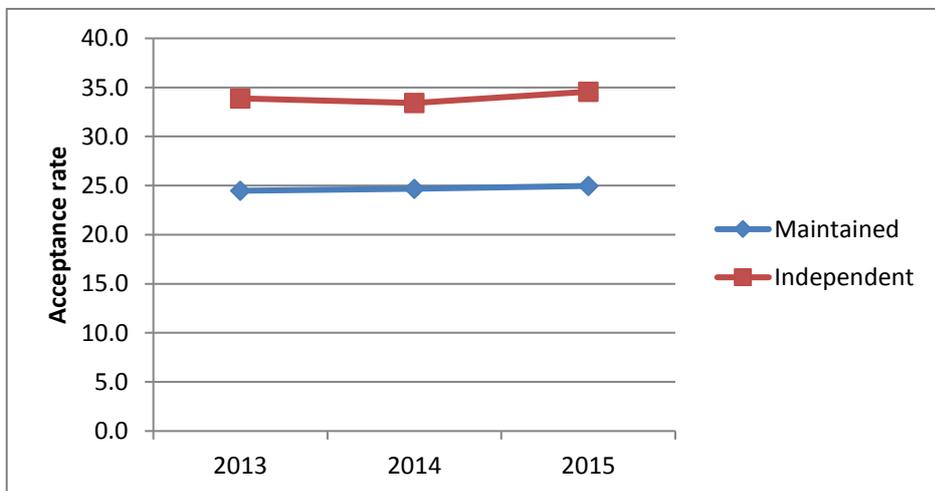


Figure 3: Acceptance rate (percentage of applicants ultimately accepted) of Cambridge applicants, by year and school type.

Offer and acceptance rates were notably lower for applicants from maintained schools, but this could simply have been because their A Level attainment was lower. Thus, it is important that target estimates take into account the A Level attainment of maintained and independent school pupils.

National A Level attainment by school type

National A Level attainment data, particularly the numbers of students at grades A*A*A and above, provide an indication of the total number of appropriately qualified students in English schools from which the University of Cambridge might hope to recruit.

Table 3 shows data derived from Cambridge Assessment statistical reports on the number and percentage of students nationally that attained AAA or better at A Level in 2010, 2012 and 2014, split by the type of school they attended⁸. Table 4 shows this same data, but with each candidate only included in one of the specific A Level attainment categories, and with the “A*A*A* or better category” for 2012 and 2014 further disaggregated into those with 3 A*s or 4+ A*s⁹. These data are illustrated in Figures 4 and 5.

It is apparent from Figure 5 in particular that the proportion of each grade category achieved by maintained school pupils nationally - up to and including 3A* - increased from 2010 to 2014. Considering only candidates with 2 or 3 A*s (A*A*A+ category), the percentage of achievers from maintained schools was 65.1%, which was approx. 1% higher than in 2010 (64%) and very similar to 2012 (65%). The data in Table 4 show that the proportion of grades obtained by maintained school pupils was lower at the very highest levels of achievement; in 2014, 68.1% of A*A*A profiles were obtained by maintained school pupils, but only 63.8% of 3A* profiles and 54.8% of profiles comprising 4+ A*s. Pupils with the highest A Level grade profiles were therefore more likely to be from independent schools than pupils with the lower profiles considered here.

⁸ References for the 2013 and 2015 Cambridge Assessment reports are given above.

⁹ These data were derived from a report which was very kindly produced at our request by Carmen at Cambridge Assessment (C. Rodeiro, 2015, *Candidates awarded the A* grade at A level in 2012 and 2014*)

2010	Maintained N	Maintained %	Indep N	Indep %	Total
AAA or better	20269	67.2	9875	32.8	30144
A*AA or better	14082	66.3	7150	33.7	21232
A*A*A or better	7151	64.0	4029	36.0	11180
A*A*A* or better	2813	60.6	1826	39.4	4639
2012	Maintained N	Maintained %	Indep N	Indep %	Total
AAA or better	20601	68.1	9663	31.9	30264
A*AA or better	14423	67.0	7110	33.0	21533
A*A*A or better	7480	65.0	4030	35.0	11510
A*A*A* or better	3041	62.0	1863	38.0	4904
2014	Maintained N	Maintained %	Indep N	Indep %	Total
AAA or better	19443	68.4	8977	31.6	28420
A*AA or better	14263	67.1	6983	32.9	21246
A*A*A or better	7696	65.1	4129	34.9	11825
A*A*A* or better	3110	61.1	1978	38.9	5088

Table 3: Number and percentage of students in English schools, by attainment, school sector and year. Attainment categories are not mutually exclusive; for example, category “AAA or better” includes all those in the “A*AA or better” category, plus candidates achieving AAA.

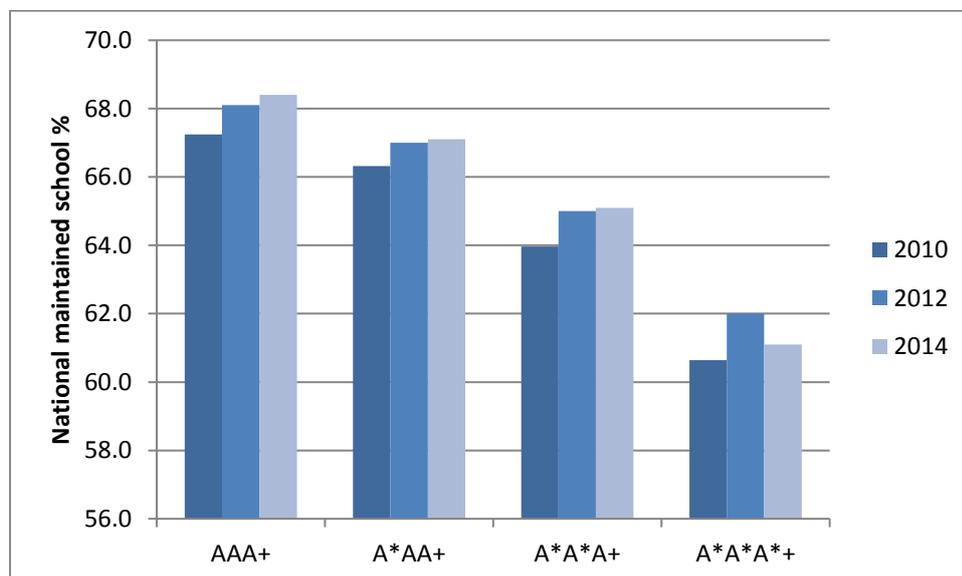


Figure 4: Percentage of A Level results in the given categories achieved by maintained sector candidates, as opposed to independent school candidates.

2010	Maintained N	Maintained %	Indep N	Indep %	Total
AAA	6187	69.4	2725	30.6	8912
A*AA	6931	69.0	3121	31.0	10052
A*A*A	4338	66.3	2203	33.7	6541
3 A*+	2813	60.6	1826	39.4	4639
<hr/>					
2012	Maintained N	Maintained %	Indep N	Indep %	Total
AAA	6178	70.8	2553	29.2	8731
A*AA	6943	69.3	3080	30.7	10023
A*A*A	4439	67.2	2167	32.8	6606
3 A*	2173	63.3	1262	36.7	3435
4 A*+	868	59.1	601	40.9	1469
(3 A*+)	3041	62.0	1863	38.0	4904
<hr/>					
2014	Maintained N	Maintained %	Indep N	Indep %	Total
AAA	5180	72.2	1994	27.8	7174
A*AA	6567	69.7	2854	30.3	9421
A*A*A	4586	68.1	2151	31.9	6737
3 A*	2282	63.8	1294	36.2	3576
4 A*+	828	54.8	684	45.2	1512
(3 A*+)	3110	61.1	1978	38.9	5088

Table 4: Number and percentage of students in English schools, by attainment, school sector and year. Attainment categories are mutually exclusive. The “3 A*+” category is given for 2012 and 2014 to facilitate comparison with 2010.

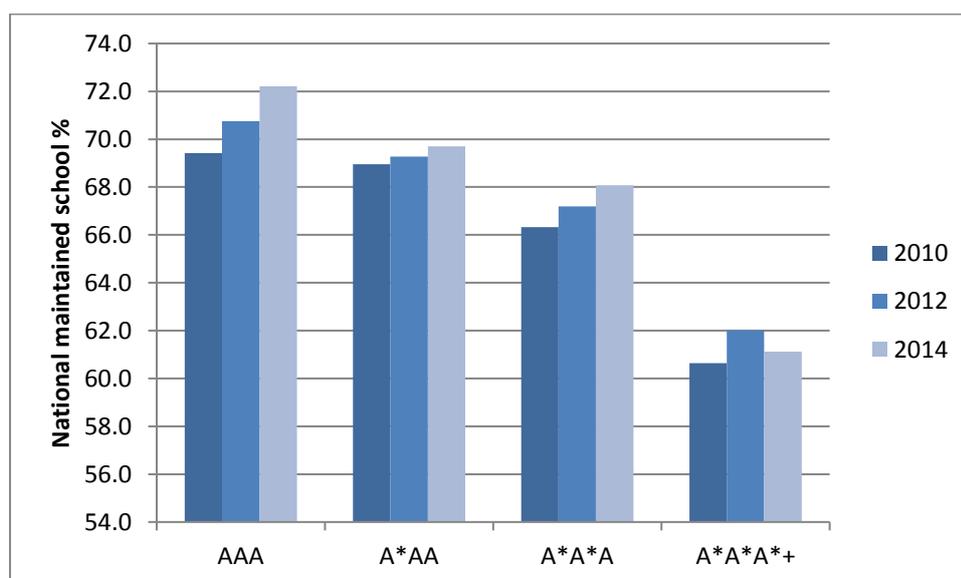


Figure 5: Percentage of high A Level in the given (mutually exclusive) categories achieved by maintained sector candidates, as opposed to independent school candidates.

A Level attainment of Cambridge applicants

Whilst national data may indicate the total population of students from which the University can potentially recruit, the University only actually has the opportunity to recruit from the pool of all applicants that apply to the University of Cambridge. Therefore, the distribution of Cambridge applicants by A Level attainment and school type is also relevant to our assessment of an appropriate target for the proportion of maintained school students that the University should admit. Additionally, an advantage of working with internal data concerning our own applicants is that we have access to additional information, including which degree subject they applied for. We used this information to consider applicants for Sciences and Arts subjects separately (as well as together) in this analysis, which was advantageous because they have different typical offer levels of A*A*A and A*AA, respectively¹⁰. Furthermore, we considered applications for Mathematics separately from the rest of the Sciences subjects because of the unique and critical emphasis placed on the Sixth Term Examination Paper (STEP) for admission. Applications, offers and acceptances of Cambridge applicants for the last two cycles only (2014 and 2015) are given in Table 5, split by A Level grade profile and school type. The acceptances in Table 5 were used to calculate the proportions of acceptances attributed to applicants from maintained schools for each subject; these are summarised later in Table 10.

¹⁰ At the time of writing, the only exception for 2016 entry was Psychological and Behavioural Sciences which has a typical offer level of A*AA instead of A*A*A.

		Applications					
		<AAA	AAA	A*AA	A*A*A	A*A*A*+	Total
Mathematics	Maintained	262	28	223	400	468	1381
	Independent	X	X	21	46	133	215
Sciences (excl. Maths)	Maintained	1030	515	1050	1153	1940	5688
	Independent	X	X	277	385	1066	1991
Arts	Maintained	1291	558	1113	1005	671	4638
	Independent	298	178	583	668	620	2347
Total (excl. Maths)	Maintained	2321	1073	2163	2158	2611	10326
	Independent	X	X	860	1053	1686	4338
Total (incl. Maths)	Maintained	2583	1101	2386	2558	3079	11707
	Independent	440	314	881	1099	1819	4553
		Offers					
		<AAA	AAA	A*AA	A*A*A	A*A*A*+	Total
Mathematics	Maintained	X	X	41	165	320	548
	Independent	X	X	X	24	99	132
Sciences (excl. Maths)	Maintained	X	X	83	251	1073	1447
	Independent	X	X	X	69	603	701
Arts	Maintained	156	159	423	512	451	1701
	Independent	31	31	198	288	397	945
Total (excl. Maths)	Maintained	X	X	506	763	1524	3148
	Independent	X	X	X	357	1000	1646
Total (incl. Maths)	Maintained	198	179	547	928	1844	3696
	Independent	36	38	224	381	1099	1778
		Acceptances					
		<AAA	AAA	A*AA	A*A*A	A*A*A*+	Total
Mathematics	Maintained	X	X	X	52	172	228
	Independent	X	X	X	8	66	76
Sciences (excl. Maths)	Maintained	X	X	X	225	1046	1326
	Independent	X	X	X	65	588	665
Arts	Maintained	51	66	389	494	442	1442
	Independent	9	6	181	278	393	867
Total (excl. Maths)	Maintained	X	X	X	719	1488	2768
	Independent	X	X	X	343	981	1532
Total (incl. Maths)	Maintained	59	69	437	771	1660	2996
	Independent	11	6	193	351	1047	1608

Table 5: Numbers of Cambridge applications, offers and acceptances, by A Level grade profile, subject category (Mathematics, Sciences, Arts) and school type, for the 2014 and 2015 cycles combined. Where the number of students in any cell was 5 or less, the number was suppressed and replaced with "X". Additional numbers were also removed and replaced with "X" as necessary to prevent calculation of the suppressed numbers.

It is notable that the overall proportion of maintained school acceptances (65.1%; see Table 10; calculated from acceptances for “Total incl. Maths” in Table 5) is higher than that derived from Table 1 for the same years (2014 and 2015 combined), which would only have been 62.3% (3117:1887 maintained:independent). This difference is explained by the fact that Table 1 included students accepted with less than 3 A Levels, the majority of whom would have taken alternative qualifications such as the IB or Pre-U. In total, there were an additional 400 accepted applicants included in Table 1 with less than 3 A Levels, of which only 121 (30.3%) were from maintained schools. However, in the absence of attainment data for alternative qualifications taken, which was beyond the scope of this analysis, it is not possible to assess whether or not equivalently qualified maintained school applicants with alternative qualifications had a success rate comparable to independent school applicants. This issue is also considered in the “target adjustments” section of this paper.

The different sizes of the maintained and independent groups in Table 5 make them hard to compare directly. Interpretation is facilitated by calculating offer and acceptance rates for each group (Table 6). The most striking difference is between Science and Arts applicants; applicants for Arts subjects had much higher offer and acceptance rates. For Arts subjects, offer and acceptance rates were actually higher for applicants from maintained schools than for applicants from independent schools, for all the specific A Level attainment grade profiles considered. For Sciences subjects, maintained school pupils with A*A*A or lower typically had higher offer and acceptance rates than their independent school counterparts, but for the A*A*A*+ category, which was the largest and included the majority of successful applicants, offer and acceptance rates were higher for independent school pupils. For Mathematics, maintained school applicants had lower offer and acceptance rates in all A Level grade categories, although some of these rates were based on very low numbers of applicants, offers and acceptances, and the low rates could have been related to A Level subject choices or to performance in the highly critical STEP test, which were not accounted for – these issues are also considered in the “target adjustments” section of this paper. Looking at applicants for all subjects other than Mathematics (i.e. “Total (excl. Maths)”), the figures presented here indicate that there might have been a slight inequality in favour of independent school applicants in the highest and most populous attainment category (A*A*A*+), although the opposite pattern is seen for the second highest and most populous attainment category (A*A*A).

		Offer rate				
		<AAA	AAA	A*AA	A*A*A	A*A*A**
Mathematics	Maintained	X	X	18.4	41.3	68.4
	Independent	X	X	X	52.2	74.4
Sciences (excl. Maths)	Maintained	X	X	7.9	21.8	55.3
	Independent	X	X	X	17.9	56.6
Arts	Maintained	12.1	28.5	38.0	50.9	67.2
	Independent	10.4	17.4	34.0	43.1	64.0
Total (excl. Maths)	Maintained	X	X	23.4	35.4	58.4
	Independent	X	X	X	33.9	59.3
Total (incl. Maths)	Maintained	7.7	16.3	22.9	36.3	59.9
	Independent	8.2	12.1	25.4	34.7	60.4
		Acceptance rate				
		<AAA	AAA	A*AA	A*A*A	A*A*A**
Mathematics	Maintained	X	X	X	13.0	36.8
	Independent	X	X	X	17.4	49.6
Sciences (excl. Maths)	Maintained	X	X	X	19.5	53.9
	Independent	X	X	X	16.9	55.2
Arts	Maintained	4.0	11.8	35.0	49.2	65.9
	Independent	3.0	3.4	31.0	41.6	63.4
Total (excl. Maths)	Maintained	X	X	X	33.3	57.0
	Independent	X	X	X	32.6	58.2
Total (incl. Maths)	Maintained	2.3	6.3	18.3	30.1	53.9
	Independent	2.5	1.9	21.9	31.9	57.6

Table 6: Offer rate (percentage of applicants receiving an offer) and acceptance rate (percentage of applicants ultimately accepted) of Cambridge applicants, by A Level grade profile, subject category and school type, for the 2014 and 2015 cycles combined. Cells highlighted in blue indicate that the highest offer/acceptance rate for that subject and A Level grade category was achieved by maintained school applicants, whilst red indicates it was achieved by independent school applicants. Rates based on low numbers of applications, offers and acceptances are relatively unreliable; to indicate this, cells containing offer and acceptances rates based on fewer than a (somewhat arbitrary) threshold of 10 offers or acceptances are highlighted in grey. Figures in this Table were removed and replaced with "X" if they were derived from 5 or fewer students, or as necessary to prevent calculation of the suppressed numbers in Table 5.

The fact that maintained school pupils accounted for lower percentages of Cambridge acceptances than of offers in all 3 years assessed (Table 1) indicates that attrition rates must have been higher for maintained school applicants. We calculated attrition rates between offer and acceptance for Cambridge applicants, to ascertain whether or not this was the case when type of degree subject and A Level attainment were taken into account (Table 7). Maintained school offer-holders typically had higher (or equal) attrition rates compared to their independent school counterparts, regardless

of whether their offer was for Science or Arts subjects. The very high attrition rates for Mathematics compared to other subjects are likely related to offer conditions including STEP.

		Conversion attrition rate (between offer and acceptance)				
		<AAA	AAA	A*AA	A*A*A	A*A*A*+
Mathematics	Maintained	X	X	X	68.5	46.3
	Independent	X	X	X	66.7	33.3
Sciences (excl. Maths)	Maintained	X	X	X	10.4	2.5
	Independent	X	X	X	5.8	2.5
Arts	Maintained	67.3	58.5	8.0	3.5	2.0
	Independent	71.0	80.6	8.6	3.5	1.0
Total (excl. Maths)	Maintained	X	X	X	5.8	2.4
	Independent	X	X	X	3.9	1.9
Total (incl. Maths)	Maintained	70.2	61.5	20.1	16.9	10.0
	Independent	69.4	84.2	13.8	7.9	4.7

Table 7: Conversion attrition rate (percentage receiving an offer but not acceptance) of Cambridge applicants, by A Level grade profile, subject category and school type, for the 2014 and 2015 cycles combined. Cells highlighted in blue indicate that the lowest attrition rate for that subject and A Level grade category was achieved by maintained school applicants, whilst red indicates it was achieved by independent school applicants. Rates based on low numbers of offers and acceptances are relatively unreliable; to indicate this, cells containing attrition rates based on fewer than a (somewhat arbitrary) threshold of 10 acceptances are highlighted in grey. Figures in this Table were removed and replaced with "X" if they were derived from 5 or fewer students, or as necessary to prevent calculation of the suppressed numbers in Table 3.

Maintained school admissions target estimates

a) National A Level attainment and the average number of A*s attained by accepted Cambridge applicants (previous method)

The University's maintained school target was first determined in a 2011 paper by Richard Partington¹¹. Therein, it was reasoned that because Cambridge entrants had an average of 2.5 A*s, the maintained school admissions target should be set in between the proportion of "A*A*A or better" A Level profiles achieved by maintained-sector students nationally (64.06%), and the proportion of "A*A*A* or better" profiles achieved by such students (60.72%). Specifically, the suggested target was 62-63%, which was then subject to some small adjustments (which are discussed in the "target adjustments" section of this paper).

According to the most recent data available (Table 3; 2014), the proportion of "A*A*A or better" (A*A*A+) grades achieved by maintained school students was 65.1%, and the proportion of "A*A*A* or better" (A*A*A*+) grades was 61.1%. Additionally, the most recent figures (summarised in Table 8) show that the average number of A*s attained by an accepted Home Cambridge applicant in

¹¹ R. Partington, 2011, *UK State-Sector Undergraduate Admissions to Cambridge: What is an Achievable Target?*, available at: <http://www.cao.cam.ac.uk/admissions-research/achievable-target>

2014-15 was 2.712 rather than 2.5. Applying the Partington method to these most recent figures, a suitable target would be between 65.1% and 61.1%, but should now be weighted towards the latter (because 2.712 is closer to 3 than to 2). We estimate that this would produce a target of approximately 62% (before adjustments). However, this method has some shortcomings, including the fact that the national A Level attainment of maintained and independent school pupils achieving less than 2 A*s has no influence on the estimate produced, and that there is no distinction between 3 and 4+ A*s.

ALL SUBJECTS (incl. Maths)	Maintained and Independent combined					
	Not accepted			Accepted		
	2014	2015	Total	2014	2015	Total
Average A*s	1.368	1.423	1.395	2.683	2.740	2.712

Table 8: Average number of A*s attained at A Level by Cambridge applicants, by acceptance (not accepted or accepted) and year.

b) National A Level attainment and attainment of accepted Cambridge applicants in A Level grade categories

Taken at face value, Cambridge A Level entry requirements (i.e. offer levels) are typically A*AA for Arts and A*A*A for Sciences. However, a minority of applicants are accepted with A Level grades below these standards, and the majority of successful applicants exceed them (see Acceptances in Table 5); there is no single Cambridge A Level entry requirement, or standard for a competitive application, since our assessment is holistic and takes into account factors such as performance in tests, assessments and at interview. Thus, to produce a fair and accurate estimate for our maintained school admissions target, we took into account the maintained school proportions of a range of A Level grade profiles, and we gave certain A Level grade profiles greater emphasis or weighting than others, depending on the typical proportion of successful Cambridge applicants achieving them. For example, Table 5 Acceptances show that relatively few applicants were accepted with A*AA or less, so the proportion of maintained school students that attained these A Level grades nationally had little influence on our target estimate; in contrast, the national maintained school proportion of A*A*A*+ students had the greatest influence, because this was the largest group of successful Cambridge applicants. Full details of the calculation are provided in Appendix A. The resulting target estimate is **63.3% (before adjustments)**.

c) A Level attainment of Cambridge applicants and accepted Cambridge applicants in A Level grade categories

As an alternative to the above, a target can be estimated based on the maintained school proportions of *Cambridge applicants* achieving certain A Level grades (rather than the national maintained school proportions of students achieving those grades), reasoning that maintained school applicants to Cambridge should be admitted in proportion to their achievement of the Cambridge A Level entry requirement. This target will indicate the proportion of maintained admissions that the University might currently expect to achieve based on the profiles of its recent pool of applicants. As noted above, an advantage of working with Cambridge applicant data is that

information is available concerning degree subject applied for, which we used to increase the accuracy of the estimate.

The proportion of Cambridge applicants from maintained schools is shown in Table 9 for each degree subject and attainment category. Target estimates were calculated for each type of degree subject using the same method as in section b), but using the maintained proportions from Table 9. Full details of the calculations are provided in Appendix B, and the resulting targets are summarised in Table 10.

% of A Level grade profiles achieved by maintained	<AAA	AAA	A*AA	A*A*A	A*A*A*	4 A*+
Mathematics	X	X	91.39	89.69	81.84	72.02
Science (excl. Maths)	X	X	79.13	74.97	68.91	59.12
Arts	81.25	75.82	65.63	60.07	54.60	42.50
Total (excl. Maths)	X	X	71.55	67.21	63.50	56.25
Total (incl. Maths)	85.44	77.81	73.03	69.95	65.67	58.31

Table 9: Proportion of each A Level grade profile achieved by (Home) applicants from maintained schools, for 2014 and 2015 combined. These proportions are based on Table 5 Applications (but with the 3A+ category split further). Figures in this Table were removed and replaced with “X” if they were derived from 5 or fewer students, or as necessary to prevent calculation of the suppressed numbers in Table 5.*

Degree subject(s)	Target %	Actual %
Mathematics only	79.3	75.0
Sciences only	65.7	66.6
Arts only	59.5	62.5
All subjects excl. Maths (used subject information in calculation)	62.3	64.4
All subjects incl. Maths (used subject information in calculation)	63.5	65.1
All subjects excl. Maths (subject information disregarded in calculation)	(64.3)	64.4
All subjects incl. Maths (subject information disregarded in calculation)	(66.2)	65.1

Table 10: Estimated target percentages of acceptances of students from maintained schools, for the given degree subject(s). Production of these estimates is detailed in Appendix B, and was based on 2014 and 2015 data. The Actual proportions shown are based on Table 5 acceptances data for the same years.

The overall target produced (“All subjects incl. Maths”) based on 2014-15 data, which is closely comparable to that based on national A Level attainment data for 2014 (63.3%), is **63.5% (before adjustments)**. Interestingly, based on data for acceptances of Home Cambridge applicants with at least 3 A Levels only (Table 5), the University actually exceeded this proportion of admissions from the maintained school sector in recent years, with 65.1% admissions from maintained schools. This target estimate for “All subjects incl. Maths” was produced using degree subject information, i.e., although it applies to all subjects once calculated, information about degree subject was taken into account when calculating it. However, if we had not had, or had not used, this information about

degree subject applied for, we could nonetheless have produced a less accurate target estimate; as shown in Table 10, this estimate would have been much higher, at 66.2%.

As an interim conclusion, we have produced two similar maintained school student admissions targets of 63.3% and 63.5% (before adjustments), using methods based on national A Level attainment profiles by school type and Cambridge applicant A Level attainment profiles by school type, respectively. Several caveats apply to these targets, including that they were not adjusted to take account of choice of A Level subject, takers of alternative KS5 qualifications, or STEP results for Mathematics applicants. Adjustments to address these issues are discussed in the next section.

Target adjustments and limitations

In his 2011 paper, Richard Partington discussed the need for adjustments to the maintained sector target to account for the factors discussed above, and concluded that it was appropriate to adjust the target based on national English A Level results by -1%¹². If the same net level of adjustment were applied here, the resulting target estimate based on national attainment would be ~62.3%, which would more-or-less equate to a range of 61-64%.

We decided that fully re-evaluating two of these adjustments was beyond the scope of this paper. First is the adjustment for STEP, which Richard Partington set at 0% (i.e. no adjustment). The issue is that the target estimate calculations stratify applicants by A Level attainment, but not by STEP, which is also critical for Mathematics admissions. So whilst the data presented here do show that the proportion of Mathematics students admitted from maintained schools was lower than would be expected from A Level grade profiles (i.e. actual percentage of maintained admissions is lower than the calculated target estimate in Table 10), we do not know if it is lower than would be expected from their STEP performances (which were not considered here). Thus, it may be the case that by not taking STEP performance into account, we are over-estimating the proportion of Mathematics acceptances that should be from maintained schools, and that our overall target estimate is higher than it should be. However, without investigating further, we cannot be sure whether this is the case or not, so we have not reduced our target estimates to account for STEP. Not making this reduction is the conservative course of action, ensuring that the estimates that we produce will be conservative (i.e. relatively high).

Second is the adjustment for A Level subject choice. Richard Partington estimated that the effect of maintained school students having a greater tendency of not taking, or of being unable to take, appropriate A Level subjects which are desirable or required for certain Cambridge degree subjects should be to lower the maintained target estimate by 1.5%. Although desirable, assessing the effect of A Level subject combinations would be very complex and time consuming, and unfortunately it is beyond the scope of this target estimate research. However, to ensure that the target estimate that we produce is conservative (i.e. relatively high), we have decided to reduce the adjustment from -1.5% to -1%.

¹² Adjustment for A Level subjects -1.5%; IB -1%; STEP 0%; Non-English UK +1.5%

A target adjustment to account for takers of KS5 qualifications other than A Levels is more tractable. The issue here is that the target estimate of 63.3/63.5% was produced based on data for admissions of students with A Levels only, and it cannot necessarily be generalised to all applicants. The influence of these alternative qualifications is evident in the fact that when applicants with them are included, the University only accepted 62.3% maintained school students in 2014-15, but if only applicants with at least 3 A Levels are included, maintained school students accounted for 65.1% of acceptances. As discussed above, this is because only 30.3% of applicants admitted with less than 3 A Levels (who are assumed to have alternative KS5 qualifications) were from maintained schools – dramatically lower than the percentage of applicants with at least 3 A Levels. In 2014 and 2015 combined, 7.99% of Cambridge entrants did not have at least 3 A Levels, and likely took other qualifications such as the IB, Pre-U or Scottish Highers. Whilst the target of 63.3/63.5% (based on national/Cambridge) applies to the 92% of applicants with at least 3 A Levels, a different target may be appropriate for these 7.99%. Without attainment data for these alternative qualification takers, we cannot precisely determine what the proportion of maintained sector admissions for the group should be, or assess whether the current rate of maintained student admissions is fair (30.3%). However, we took the relatively conservative approach of estimating that the proportion of maintained students admitted among this 7.99% of entrants should be proportional to their numbers at the stage of application (which is 45.9%), or in other words to assume that maintained school students with less than 3 A Levels have the same average level of attainment as their independent school counterparts. This results in target estimates of 61.95/62.06% (National/Cambridge), i.e. an adjustment of approximately -1.4%, which despite being conservative is still greater than the negative adjustment made by Richard Partington (-1%, for IB only)¹³.

The final adjustment to consider applies to the target estimate based on national data only, and is necessitated by the fact that those national data were only for students in English schools, whereas we want to produce a target estimate which is applicable to admissions of all Home applicants (also including Scotland, Wales and Northern Ireland). Just as the 63.3% target based on national A Level attainment may not be appropriate for the 7.99% of entrants with alternative qualifications, it may not be appropriate for a further 4.28% of Cambridge entrants that have at least 3 A Levels (i.e. they are not already accounted for in the adjustment for alternative qualifications) and are resident in Scotland, Wales or Northern Ireland. The proportion of maintained school admissions from these countries in 2014 and 2015 combined was 77.6%, reflecting the fact that KS5 students in those countries are less likely to attend independent schools. The adjustment could be based on this 77.6%, but we have based it more conservatively on the proportion of maintained school applications from these countries – 84.3%. When this adjustment is made for non-English applicants in addition to the adjustment for non-A Level applicants, the conservative target estimate based on national data is 62.85%, i.e. the adjustment made for non-English applicants is +0.9%.

¹³ The least conservative adjustment, assuming that the current rate of admissions (30.3%) is a fair reflection of relative attainment, would be -2.65%.

After all the adjustments, the target estimate based on national A Level attainment data is **61.8%**, whilst the target estimate based on A Level attainment of Cambridge applicants is **61.1%**¹⁴.

Conclusion

Based on the most recent national A Level attainment data available from Cambridge Assessment (2014), with conservative adjustments, we have calculated that a suitable admissions target is that 61.8% of the University's admissions should be of students from maintained schools. The University's actual admissions figures show that the collegiate University has exceeded this target in recent years, with 62.2% maintained student acceptances in 2014, and 62.4% in 2015. This is even more impressive considering that the adjusted target based on 2014-15 A Level attainment of Cambridge applicants is only 61.1% at most, which means that the University is admitting more maintained students than might be expected from the profile of its current applicant pool. Offer and acceptance rates demonstrate that this may largely be due to maintained school applicants for Arts subjects having higher success rates compared to equivalently qualified independent school applicants. However, whilst the present research identified some pockets of advantage for maintained school students, it also identified some pockets of disadvantage: first, attrition rates were typically higher for maintained school students, and second, maintained school applicants for Sciences with 3 A*+ had lower offer and acceptance rates than their independent school counterparts. Addressing these could enable the collegiate University to increase the proportion of maintained school students accepted further still.

The present research suggests that an evidence-based target would actually be up to 61.8%, which is substantially lower than the ultimate target in the collegiate University's 2016-17 Access Agreement with OFFA of 64% (by 2019-20). Nonetheless, in the spirit of setting a stretching target, the collegiate University decided to retain an ultimate target of 64% in our latest 2017-18 Access Agreement, starting with a range of 62-64% in the first year.

Dr Alexa Horner

Research Officer, CAO

October 2016

¹⁴ Summary of adjustments.

National: A Level subjects -1%; non-English UK +0.9%; alternative KS5 qualifications -1.4%; STEP 0%. Thus, 63.3% becomes 61.8% after adjustments.

Cambridge: A Level subjects -1%; non-English UK 0%; alternative KS5 qualifications -1.4%; STEP 0%. Thus, 63.5% becomes 61.1% after adjustments.

APPENDIX A – Calculation of maintained school student acceptances target percentage based on national profile

The appropriate influence (“Weighting”) of each A Level attainment category was determined from the number of 2014 and 2015 Cambridge acceptances in the category (from Table 5, but with the 3A*+ category split further, to increase the accuracy of the estimate). These weightings were then applied to the 2014 national percentages of maintained students in each category (National maintained %; from Table 4¹⁵) to calculate a target percentage of acceptances from maintained schools:

Target maintained school student acceptances % = (Weighting_{AAA} x National maintained %_{AAA}) + (Weighting_{A*AA} x National maintained %_{A*AA}) +... .. + (Weighting_{4A*+} x National maintained %_{4A*+})

	Cambridge acceptances	Weighting	National maintained %	Weighting x Maintained %
AAA	75	0.017	72.205	1.194
A*AA	630	0.139	69.706	9.686
A*A*A	1122	0.247	68.072	16.845
A*A*A*	1466	0.323	63.814	20.633
4 A*+	1241	0.274	54.762	14.989
Total	4534	1.000		63.348

¹⁵ National data were not available for the <AAA category, which was therefore not included in this calculation.

APPENDIX B – Calculation of maintained school student acceptances target percentage based on Cambridge applicant profile

The appropriate influence (“Weighting”) of each A Level attainment category was determined from the number of 2014 and 2015 Cambridge acceptances in each category (from Table 5, but with the 3A*+ category split further). These weightings were then applied to the 2014-15 percentages of maintained school Cambridge applicants in each category (Maintained %; calculated from Table 5 applications, but with the 3A*+ category split further) to calculate a target percentage of acceptances from maintained schools, for each degree subject type:

Target maintained school student acceptances % = (Weighting_{<AAA} x Maintained %_{<AAA}) + (Weighting_{AAA} x Maintained %_{AAA}) + + (Weighting_{4A*+} x Maintained %_{4A*+})

Suppression (indicated “X”) was applied as described in the main paper. Please note that figures in the “Weighting x Flag %” columns are shown rounded to 1 decimal place, but unrounded figures were used in calculations (which may result in some figures appearing to be incorrect).

a) Target maintained school student acceptances % for MATHEMATICS only

	Mathematics acceptances	Weighting	Maintained %	Weighting x Maintained %
<AAA	X	X	X	1.6
AAA	X	X	X	0.0
A*AA	X	X	91.393	0.3
A*A*A	60	0.197	89.686	17.7
A*A*A*	105	0.345	81.844	28.3
4 A*+	133	0.438	72.016	31.5
Total	304	1.000		79.3

b) Target maintained school student acceptances % for Sciences subjects only

	Science acceptances	Weighting	Maintained %	Weighting x Maintained %
<AAA	X	X	X	0.2
AAA	X	X	X	0.1
A*AA	X	X	79.126	2.3
A*A*A	290	0.146	74.967	10.9
A*A*A*	724	0.364	68.912	25.1
4 A*+	910	0.457	59.121	27.0
Total	1991	1.000		65.7

c) Target maintained school student acceptances % for Arts subjects only

	Arts acceptances	Weighting	Maintained %	Weighting x Maintained %
<AAA	60	0.026	81.246	2.1
AAA	72	0.031	75.815	2.4
A*AA	570	0.247	65.625	16.2
A*A*A	772	0.334	60.072	20.1
A*A*A*	637	0.276	54.599	15.1
4 A*+	198	0.086	42.500	3.6
Total	2309	1.000		59.5

d) Target maintained school student acceptances % for All Subjects (excluding Mathematics)

		Science/Art acceptances	Weighting	Maintained %	Weighting x Maintained %
Science	<AAA	X	X	X	0.1
	AAA	X	X	X	0.1
	A*AA	X	X	79.126	1.1
	A*A*A	290	0.067	74.967	5.1
	A*A*A*	724	0.168	68.912	11.6
	4 A*+	910	0.212	59.121	12.5
Arts	<AAA	60	0.014	81.246	1.1
	AAA	72	0.017	75.815	1.3
	A*AA	570	0.133	65.625	8.7
	A*A*A	772	0.180	60.072	10.8
	A*A*A*	637	0.148	54.599	8.1
	4 A*+	198	0.046	42.500	2.0
Total		4300	1.000		62.3

e) Target maintained school student acceptances % for All Subjects (including Mathematics)

		Acceptances	Weighting	Maintained %	Weighting x Maintained %
Maths	<AAA	X	X	X	0.1
	AAA	X	X	X	0.0
	A*AA	X	X	91.393	0.0
	A*A*A	60	0.013	89.686	1.2
	A*A*A*	105	0.023	81.844	1.9
	4 A*+	133	0.029	72.016	2.1
Science	<AAA	X	X	X	0.1
	AAA	X	X	X	0.1
	A*AA	X	X	79.126	1.0
	A*A*A	290	0.063	74.967	4.7
	A*A*A*	724	0.157	68.912	10.8
	4 A*+	910	0.198	59.121	11.7
Arts	<AAA	60	0.013	81.246	1.1
	AAA	72	0.016	75.815	1.2
	A*AA	570	0.124	65.625	8.1
	A*A*A	772	0.168	60.072	10.1
	A*A*A*	637	0.138	54.599	7.6
	4 A*+	198	0.043	42.500	1.8
Total		4604	1.000		63.5

The above calculations produce estimates of the proportion of all acceptances for all degree subjects (with and without Mathematics; d and e) which should be of students from maintained schools. Although the estimates produced are for all degree subjects, information about degree subject is taken into account when calculating them; applications and acceptances (which are used to calculate the numbers of Acceptances and the Maintained %) are classified according to degree subject as well as A Level grade category. The alternative method used below for estimating an overall target for all degree subjects does not take into account information about degree subject in the calculation. The estimates produced in this way are less accurate.

**f) Target maintained school student acceptances % for All Subjects (excluding Mathematics)
– using method which disregards degree subject**

	Total (ex. Maths) acceptances	Weighting	Maintained %	Weighting x Maintained %
<AAA	X	X	X	1.3
AAA	X	X	X	1.4
A*AA	X	X	71.551	10.5
A*A*A	1062	0.247	67.206	16.6
A*A*A*	1361	0.317	63.500	20.1
4 A*+	1108	0.258	56.254	14.5
Total	4300	1.000		64.3

**g) Target maintained school student acceptances % for All Subjects (including Mathematics) –
using method which disregards degree subject**

	Total (in. Maths) acceptances	Weighting	Maintained %	Weighting x Maintained %
<AAA	70	0.015	85.445	1.3
AAA	75	0.016	77.809	1.3
A*AA	630	0.137	73.033	10.0
A*A*A	1122	0.244	69.948	17.0
A*A*A*	1466	0.318	65.666	20.9
4 A*+	1241	0.270	58.307	15.7
Total	4604	1.000		66.2