



**Evidence for
Excellence in
Education**

Report

Capacity for Collaboration?

Analysis of School-to-School Support Capacity in England

National Foundation for Educational
Research (NFER)



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Analysis of School-to-School Support Capacity in England

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Capacity for collaboration?

Interactive map tool

This [interactive map](#) allows you to explore the data and focus in on the area or phase that is of most interest. For definitions of the terms used in the interactive map, please see the main report.

How to use the interactive map

Using the navigation bar at the top of the webpage, you can choose which phase to view (primary or secondary) and whether to view by region, local authority or parliamentary constituency.

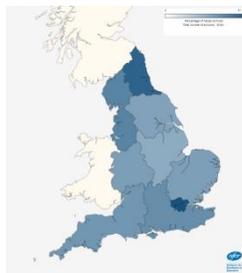
You can choose how to look at the analysis. You can either view results for:

- the number of high-performing schools per school in need (median) (Map A);
- the percentage of high-performing schools (Map B); or
- the percentage of schools in need (Map C).

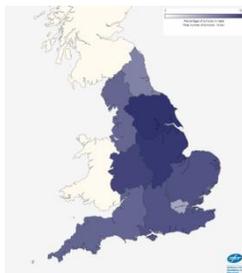
[Map A.](#) High-performing schools per school in need (median) (primary)



[Map B.](#) Percentage of high-performing schools (primary)



[Map C.](#) Percentage of schools in need (primary)



Data is represented using scaled shading where darker shading indicates a higher number/percentage. For two categories (the percentage of high-performing schools and the number of high-performing schools that each school in need has nearby) a high number/darker shade is a good thing and is represented in blue. However, a high percentage of schools in need is a cause for concern and this scale is therefore purple.

In addition, you can choose to view the number and location (as opposed to percentage) of schools on the map by selecting high-performing schools and/or schools in need. This results in green dots representing all high-performing schools (Map D) or pink dots representing all schools in need (Map E), or both (Map F), appearing on the map.

[Map D.](#) Number of high-performing schools (primary)

[Map E.](#) Number of schools in need (primary)

[Map F.](#) Number of high-performing schools and schools in need (primary)



When viewing a map, you can hover over an area to view the numerical data and zoom into regions by clicking on them.

Images from this tool are used throughout the report. Click on a map title to link to the map as displayed in the report and change the variables as described above to personalise the display to your area of interest.

Executive summary

The Government's consultation paper (2016) *Schools that work for everyone*, highlighted the importance of 'leveraging the expertise of high performing institutions to... turn around existing schools' (DfE, 2016). The NFER welcomes this collaborative approach to school improvement.

In order to assess capacity within the system for collaboration, we conducted analysis to identify and match underperforming schools and high-performing schools within a set radius¹. We only sought to match schools within the same phase (secondary or primary). Underperforming schools that are already in a multi-academy trust (MAT) were excluded from the matching process as these were assumed to already have support arrangements in place. High-performing academies in a MAT were included within the group of available high-performing schools unless, based on school performance measures alone, their MAT was not considered 'ready for further expansion' (see Hillary *et al.* 2017).

There are more high-performing schools than underperforming schools, in both phases

Our analysis shows that there are 5,677 high-performing schools and 2,511 underperforming schools (categorised for the purpose of this analysis as schools 'in need' of support), across all regions and

phases of education in England. The number of high-performing schools exceeds the number of schools 'in need' in all Government Office Regions at primary level and in most regions at secondary level.

We found that 27 per cent of primary schools are high-performing institutions and 12 per cent are in need of support. Amongst secondary schools, we identified 33 per cent as high-performing and 17 per cent in need.

Schools in need have high-performing schools nearby which could potentially provide support

In order to assess what potential support might be available, we looked at how many high-performing schools each school in need has nearby. Our analysis shows that each primary school in need has on average² (median) nine high-performing primary schools close at hand. Each secondary school has a median number of two high-performing secondary schools within our set radiuses. While having support close at hand does not necessarily mean that the schools in question will want to / will be able to help (because, for example, they may already be working with other schools), it is nonetheless positive that schools in need have options nearby that they can explore for support.

¹ High-performing schools: outstanding schools; Teaching Schools or National Support Schools; and good schools with outstanding leadership, and high levels of attainment and progress at Key Stage 2 or Key Stage 4.
Underperforming schools: below floor standards; Ofsted judgement of requires improvement or inadequate; coasting.

Set radius: 2 miles for urban schools (major and minor conurbations); 5 miles for semi-rural schools (smaller cities and towns); 10 miles for rural schools (rural towns and villages).
² This average used here, and for similar statements later in the report, is the median. We have used the median rather than the mean as the latter can be affected by outliers – in this case, one or more schools in need with a very large number of potential helpers.

Considerable regional differences exist between the numbers of schools in need and high-performing schools

Our analysis shows that primary schools in need in London have the most choice, with on average 18 high-performing primary schools nearby which they could potentially approach for collaboration. This is twice the national average and three times the amount of high-performing schools that primary schools in need in Yorkshire and the Humber have.

For secondary schools in need, each one in London has on average five high-performing secondary schools that they might approach for support, which is considerably more than North-East England, Yorkshire and the Humber or the South-West England regions, where each secondary school in need has, on average, just one high-performing school nearby.

A small number of local authorities have more schools in need than high-performing schools

Whilst the national and regional picture is promising, the analysis does reveal a small number of local authorities (LAs) where the number of schools in need outnumbers the number of high-performing schools. Yet in the self-improving system, support need not be limited to within LA boundaries. Currently, school-to-school support is delivered through, for example, MATs, Teaching School Alliances (TSAs), and national and local leaders of education operating across LA boundaries.

There is significant potential capacity in the system for school-to-school support

Evidence shows school-to-school collaboration works best between partners with some similarities and system leaders emphasise that the benefits of collaboration ought to be present for both parties. Our analysis shows significant potential capacity in the system for same-phase high-performing schools to collaborate with schools in need in close proximity. This capacity to collaborate should be prioritised as a potentially cost neutral activity at a time of budget constraint. Other sources of support previously proposed by the Government (HEIs, independent and grammar schools) are naturally at a disadvantage when it comes to collaboration because they are unlikely to have the similarities necessary for the most effective partnerships.

NFER suggests that the Government promotes this capacity for collaboration to demonstrate its commitment to the self-improving school system that is flourishing in England.

1. Background

To inform its response to the Government's *Schools that work for everyone* consultation, NFER conducted two original pieces of analysis. This report is the second of these. The other, a [research report on partially selective schools](#), was published in March (Wespieser *et al*, 2017).

In its consultation, the Government sought views on the role that selective schools, independent schools, higher education institutions and faith schools could play in meeting the need for more good school places and turning around existing schools. A summary of NFER's consultation [response](#) can be found on our website (NFER, 2016).

In order to address the issue of school-to-school support, this new NFER analysis of Edubase and school performance data asked the following research question:

Is there sufficient capacity in the system for high-performing schools to collaborate with schools in need within close geographical proximities?

School-to-school support

The self-improving system relies on high-performing schools and effective school leaders working beyond the parameters of their own institutions to support the wider school landscape. At its heart is the notion that stronger and weaker schools should work together to drive up standards for the mutual benefit of both.

Launching the self-improving school system in 2010, the Government stated:

Our aim should be to create a school system which is more effectively self-improving... It is also important that we design the system in a way which allows the most effective practice to spread more quickly and the best schools and leaders to take greater responsibility and extend their reach (DfE, 2010).

In their report on school collaboration in 2013, the Education Select Committee noted that 'school partnerships and cooperation have become an increasingly important part of what has been referred to as a "self-improving" or "school-led" system' (GB. Parliament. HoC. Education Committee, 2013).

A school-to-school partnership approach can facilitate collaboration and allow schools to provide resources to support each other while retaining autonomy. Ideally, arrangements should involve institutions demonstrating excellent practice that can be shared, whilst recognising that such practice cannot be simply replicated between institutions. Collaboration between institutions should be two-way. For example, the National Schools Commissioner, Sir David Carter, has spoken of the incentives for outstanding schools to engage with underperforming neighbours, explaining that 'every school... should be both a giver and a receiver of support' (ASCL *et. al.*, 2016) and that 'there is as much, possibly even more, to learn from the teachers who have gone from special measures to good as there is from the ones who have gone from good to outstanding' (Busby, 2016).

A school-led system also relies on effective leaders...

working collaboratively to improve the quality both of teachers entering the profession and existing teachers, cultivating peer learning within schools and between them, encouraging innovation to discover future leading practices and ultimately ownership of outcomes and the quality of education by the profession (Cruddas, 2015).

School models in the self-improving system

Recent system changes have led to the evolution of a variety of school types and a range of collaborative models have evolved as part of the self-improving school system. There are a range of formal and informal collaborative partnerships between schools such as multi academy trusts (MATs), umbrella trusts, 'hard' or 'soft' federations and TSAs. Not all institutions are in formal school-to-school partnerships; many schools remain under the remit of the local authority or are 'stand-alone' academies. There has, however, been an ever-increasing emphasis on the value of schools working together.

Evidence shows school-to-school support works best between partners with some similarities, including similar cohorts, ethos and a mutual commitment to collaboration (Walker *et al.*, 2012).

Evidence further suggests that geographical proximity is an important element of effective cooperation (ibid).

This resource (the report and accompanying interactive map) is intended to highlight the amount of potential support already within

the system with a view to revealing the capacity for collaboration available within a self-improving system.

A note on methodology

We used Edubase data to conduct new analysis, exploring the number, characteristics and locations of schools. We identified high-performing and underperforming schools using Ofsted data and DfE attainment data. We also analysed the geographical distance between them in order to assess whether or not, on this basis, there was the potential capacity to collaborate. For the purpose of our analysis, the two relevant categories were defined as follows:

- a) Underperforming schools (i.e. those that might benefit from partnerships to raise standards)
 - i. below floor standards
 - ii. Ofsted judgment of Requires Improvement
 - iii. Ofsted judgement of Inadequate
 - iv. coasting.
- b) High-performing schools within the existing system (i.e. state schools which could potentially collaborate to help raise standards). These were defined for the purpose of our analysis as:
 - i. outstanding schools

- ii. Teaching Schools or National Support Schools, Good schools with Outstanding leadership or
- iii. high levels of attainment and progress made at KS2 or KS4.

High-performing schools that fit the criteria and are already part of a MAT were excluded from further analysis if, based on school performance measures alone, the MAT was not considered 'ready for further expansion'. We have classified a MAT as 'ready for further expansion' if there are at least two good schools for every one underperforming school in the MAT (see Hillary *et al.* 2017).

In defining the distance between these groups, we recognised that an appropriate distance between potential collaborators would vary depending on geographical factors. We therefore set an optimum distance of two miles in urban locations, five miles in semi-urban locations and ten miles in rural locations.

We anticipate that schools would be best placed to understand the challenges faced by another school of the same phase, so whilst it is possible that cross-phase support could be a successful approach, we have focused in our analysis only within-phase.

While our analysis took into account whether the schools were in a MAT, no information was gathered, for the purpose of this analysis, about whether the schools were already in any other type of collaborative arrangement.

This analysis looks at the issue of school-to-school support through the lens of school performance, proximity and phase of education only. There are, of course, other factors that affect the capacity to collaborate, such as ethos, which we are unable to account for using publicly available data. Furthermore, just because a school in

need has some potential sources of help close at hand, this does not mean that these high-performing schools will be willing to help and/or have capacity to help, as they may already be supporting other schools. It is nonetheless useful to show that there is potential support nearby that most schools in need could explore.

Further details of the methodology can be found in Appendix B.

2. Findings

Our analysis shows that there is significant capacity for collaboration available in the system as most schools in need are geographically close to one or more high-performing schools.

We have identified 5,677 high-performing schools and 2,511 schools in need across all regions and phases of education. We looked at these schools in relation to their phase and geography and found significant variations, which are explored further below.

2.1 Variations between phases

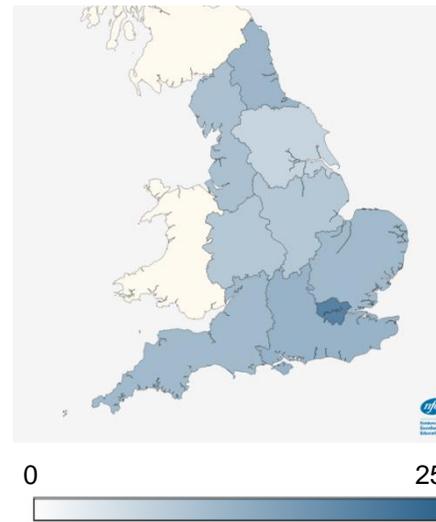
There are wide variations in the available capacity for collaboration across phases.

Maps 1 and 2 show that primary schools in need have, on average, a much higher number of high-performing schools nearby, compared to schools in need in the secondary phase³. Primary schools in need have on average (based on the median) nine high-performing schools nearby, compared to two in the secondary phase. This is not unexpected as primary schools are greater in number and therefore more geographically clustered than secondaries.

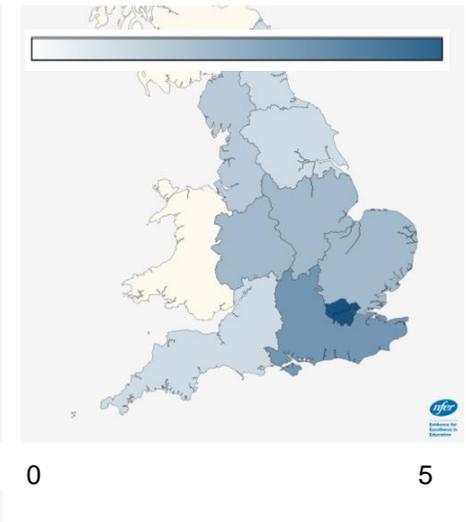
As there is such a notable difference, the following findings are all reported separately by phase.

³ Please note that it was necessary to use a different scale for primary and secondary schools due to the significant variations between phases.

Map 1 Primary high-performing schools per school in need (median ratio)



Map 2 Secondary high-performing schools per school in need (median ratio)



2.2 Regional differences

There are wide regional variations in the level of potential support available across the different regions of England. Unsurprisingly, London has the greatest capacity to collaborate. Outside London, whilst the picture remains positive, there is less capacity in some regions particularly at the secondary phase.

London has the greatest proportion of high-performing schools

London has the greatest proportion of high-performing schools and the lowest proportion of schools in need across all regions and phases.

These figures reflect the 'London effect' (Cook, 2013) which shows that student attainment is higher in the capital. Reasons cited for these better outcomes include policy initiatives such as the London Challenge (which fostered school collaborations and partnership) and Teach First, as well as the ethnic composition of the student body (Burgess, 2014).

Primary phase: 41 per cent high-performing

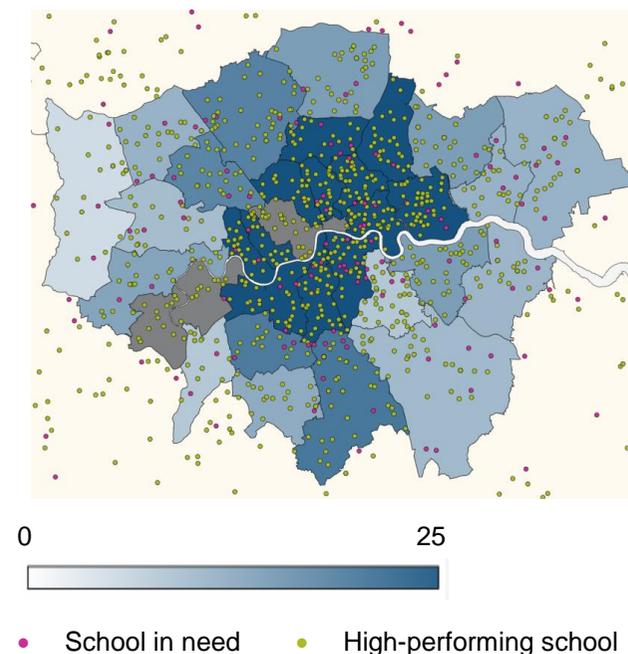
Forty-one per cent of London primary schools are high-performing and just six per cent of primary schools in the capital are in need.

Each primary school in need in London has on average 18 high-performing schools in close proximity. Almost two-thirds of primary schools in need in London have more than ten high-performing primary schools nearby, as shown in Map 3.

Secondary phase: 54 per cent high-performing

London also has the highest proportion of high-performing secondary schools (at 54 per cent) compared to eight per cent of schools in need. Each secondary school in need in London has on average five high-performing schools in close proximity.

Map 3 Primary high-performing schools per school in need (median) London



Regional picture outside London remains positive

Nationally, for each school in need, there are on average nine high-performing primaries or two high-performing secondaries nearby. However, these figures are skewed by the performance of schools in London as shown in Table 1. Outside London, the capacity for in-phase support remains positive, although a divide does start to become apparent between the north and south of England.

Table 1. Average number of high-performing schools that schools in need have nearby, by region and phase

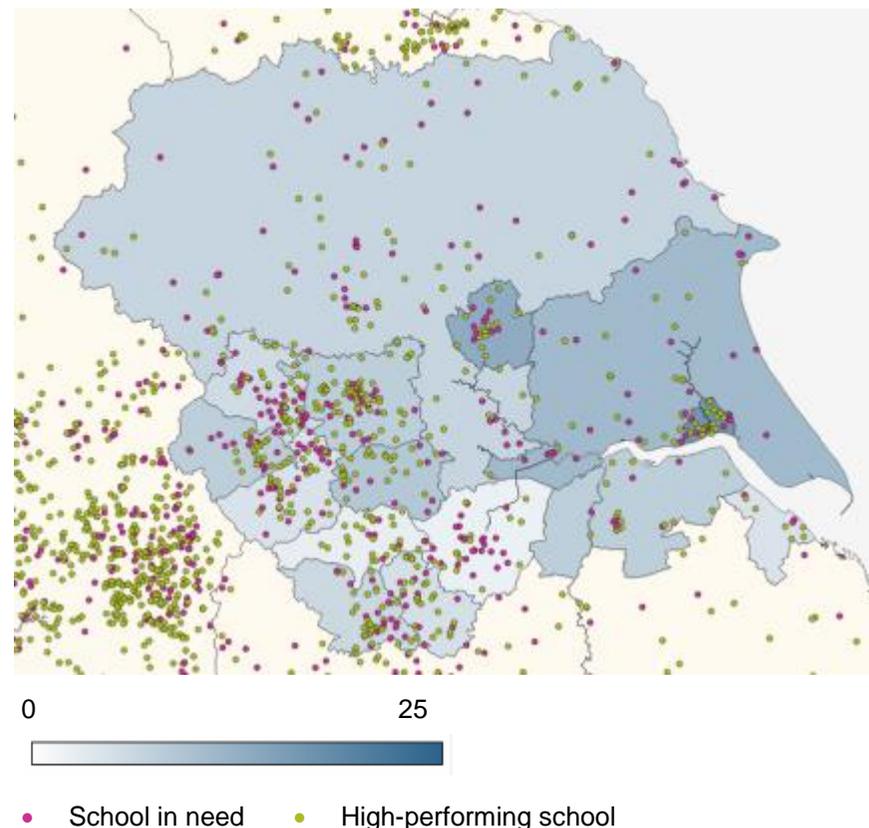
Region	Primary	Secondary
North-East England	11	1
North-West England	9	2
Yorkshire and the Humber	6	1
East-Midlands	8	2
West-Midlands	8	2
East of England	10	2
South-East England	11	3
South-West England	10	1
London	18	5
England	9	2

Primary phase: southern regions strongest

Whilst still some way off the London average (18), primary schools in need in South-East England, South-West England and the East of England have on average a greater number of high-performing primary schools nearby than there are across England as a whole. As well as these southern regions, North-East England is also comfortably above the national average.

Yorkshire and the Humber (Map 4) has the lowest of all regions; each primary school in need in this region has on average six high-performing schools nearby.

Map 4 Primary high-performing schools per school in need (median) Yorkshire and the Humber

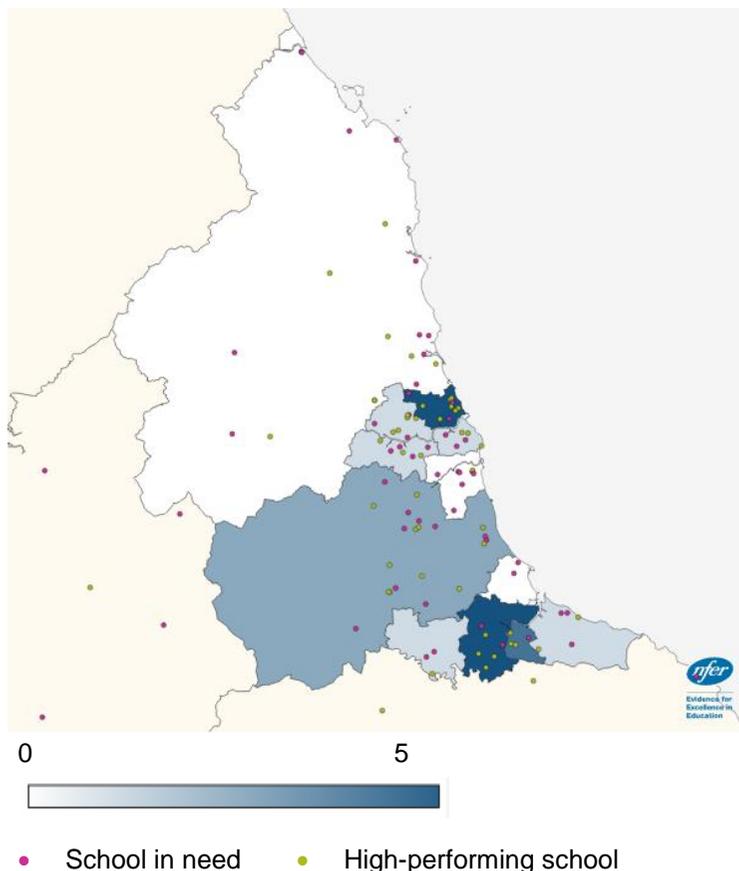


Secondary phase: limited levels of capacity

As secondary schools are fewer in number and more geographically dispersed, the levels of capacity to collaborate within the geographical boundaries applied in our analysis are more limited. They range from each secondary school in need having three high-performing secondary schools nearby in South-East

England, through to each secondary school in need having one high-performing secondary school nearby in North-East England (Map 5), Yorkshire and the Humber and South-West England.

Map 5 Secondary high-performing schools per school in need (median) North-East England



A small number of local authorities have more schools in need than high-performing schools

Whilst the national and regional picture is broadly promising, the analysis does reveal a small number of LAs where the number of schools in need outnumber the number of high-performing schools, as shown in Map 6.

However, it needs to be remembered that in the self-improving system, support need not be limited to within LA boundaries and in a growing number of cases support is provided across them. School-to-school support delivered through MATs, teaching school alliances, and national and local leaders of education all operate across LA boundaries.

Primary phase: many high-performing LAs

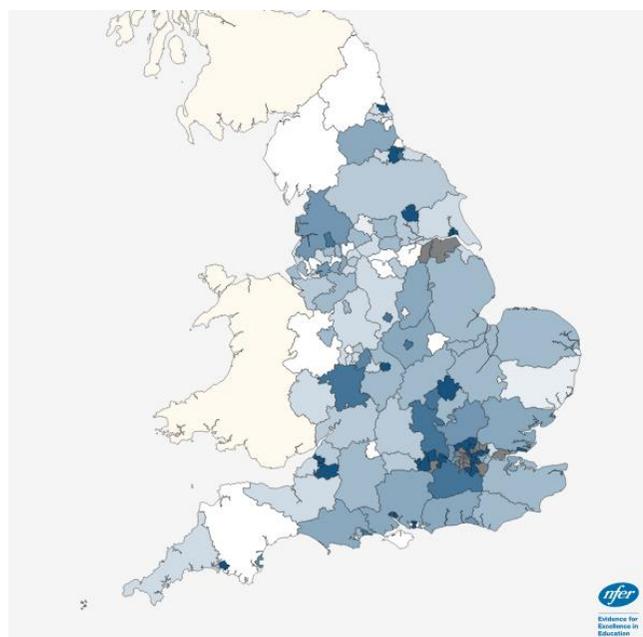
Overall, in nearly a fifth of LAs, each primary school in need has more than 20 high-performing primary schools in close proximity. Conversely, just under one in ten has the same number of primary schools in need as high-performing primaries nearby.

Secondary phase: a more complex picture

One in six LAs have secondary schools in need with more than 10 high-performing secondaries in close proximity, however almost a third have at least as many secondary schools in need as high-performing secondaries nearby. Twelve have more. That is not to say that these LAs do not have good schools. The majority of LAs

do have at least one high-performing secondary school – only Hartlepool, Isle of Wight, Knowsley, St Helens and Swindon do not⁴.

Map 6 Median number of high-performing secondary schools that have secondary schools in need nearby by LA



2.3 Schools without local sources of support

Available local capacity was defined on the basis of location of high-performing schools within set geographical parameters (two miles in urban locations, five miles in semi-urban locations and ten miles in rural locations). The distance parameters applied for this analysis were deliberately cautious and conservative. This meant that some schools' closest source of potential collaboration fell outside these limited distances.

Of all primary schools, 0.3 per cent (three per cent of those in need) and four per cent of all secondary schools (27 per cent of those in need) were further away from their nearest high-performing potential collaborator than the distances specified by our analysis. We therefore calculated the average distance these schools would have to travel to reach a high-performing school, as shown in Table 2.

Table 2. Average distance to the nearest potential collaborator for underperforming schools that have no high-performing schools within the 2/5/10 mile parameters

	Rural	Semi-urban	Urban
Primary	18 miles	6 miles	3 miles
Secondary	16 miles	9 miles	3 miles

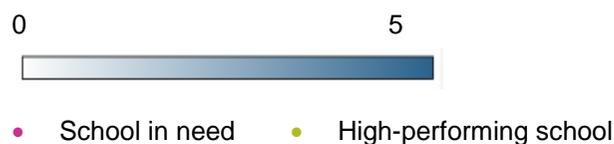
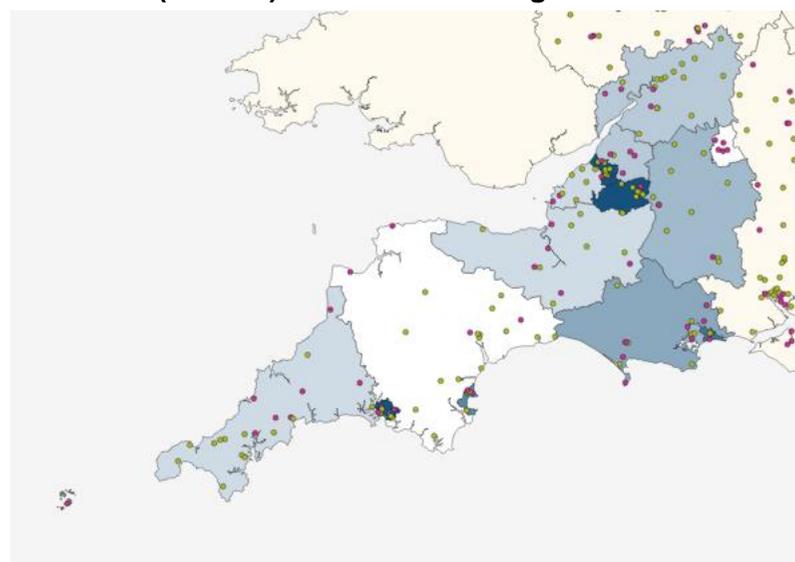
As can be seen in Map 7, secondary schools in South-West England face a particular challenge of rural isolation. Whilst this region does not have the fewest schools without a high-performing

secondary schools in need. The Isle of Scilly is also excluded as it has only one secondary school.

⁴ In addition, Blackpool does not have any high-performing secondary schools – but is not included in this list as it also does not have any

school within the geographical parameters, those secondaries (16) without a potential source of support inside the boundaries set for the analysis have the farthest to travel to reach a high-performing school (an average of 11 miles, with a maximum of 37 miles).

Map 7 Secondary high-performing schools per school in need (median) in South-West England



Many schools collaborate effectively beyond these arbitrary constraints, including effective MATs and TSAs. Overall, only one per cent of all schools (eight per cent of schools in need) do not have any high-performing schools within our set parameters.

Would this over-burden high-performing schools?

When assessing the level of potential help that might be available for school-to-school support, we have calculated how many high-performing schools there are for each school in need within a set proximity. However, where two (or more) schools in need are close together, the high-performing schools in their proximities will be counted more than once. To check whether our analysis is repeatedly 'pairing up' schools in need to the same high-performing schools, we reversed the approach. For this purpose, we hypothetically paired up each high-performing school to a maximum of one school in need. As would be expected, this resulted in most schools in need being paired up as the number in need is small when looking at the whole population of schools. Only two per cent of all schools were left unpaired (which corresponds to 17 per cent of those in need); one per cent of all primaries (11 per cent in need) and seven per cent of all secondaries (equivalent to 41 per cent in need).

These percentages are higher than the proportions of schools without a local match from our initial analysis, suggesting some degree of overlap between the available high-performing schools for some schools in need. For example, the percentage of secondary schools without a local high-performing school goes from four per cent of all schools in our initial analysis to seven per cent of all schools after the one-to-one pairing (equivalent to 27 per cent and 41 per cent of those in need). However, many schools, such as Teaching Schools and National Support Schools, are capable of collaborating effectively beyond a one-to-one relationship, and good schools may also prove to be effective sources of support.

Additionally, as well as unpaired schools in need, we found a significant number of high-performing schools remained available after the one-to-one pairing. If we relax our analysis to allow pairing of schools within region (regardless of distance), then there is potential capacity across the country at all phases except for secondary schools in North-East England, where a few schools in need might remain unpaired (four in our calculations).

3. Discussion and recommendations

NFER welcomes the Government's aim that all parts of the education system collaborate more to widen opportunity and raise standards in existing schools.

Achieving this aspiration will involve harnessing the potential identified by this analysis into actual collaboration or sponsorship arrangements, requiring local will and support, as well as recognising and appropriately resourcing the associated costs.

What this evidence demonstrates is that local schools, across the country and across both phases, are well positioned to support each other – and many already are – working collaboratively within a partnership of their choosing be it a MAT, federation or other type of cluster.

This analysis shows that there is potential capacity within the self-improving system to support improvement. The number of high-performing schools significantly exceeds the number of schools in need.

It is worth noting that this analysis is a snapshot of the current picture using the latest data available. A sensible next step would be to look at demographic trends to identify those areas where future demands on schools may be particularly high.

In a context of school budget cuts, the Government needs to consider leveraging the capacity of the high-performing institutions in the system in a way that enables all schools to improve.

We recommend that this evidence be used to support heads, governing bodies and LAs, highlighting the amount of capacity already within the system. The future success of the self-improving system will depend upon governors, trustees and school leaders embracing the opportunities offered by working with colleagues at neighbouring institutions to raise attainment for all young people.

Evidence shows school-to-school collaboration works best between partners with some similarities, including similar cohorts, ethos and a mutual commitment (Walker, *et al.*, 2012), and system leaders have emphasised that the benefit of collaboration ought to be present for both parties (ASCL *et al.*, 2016).

Our analysis reveals significant capacity in the system for same-phase high-performing schools to collaborate with schools in need in close proximity.

For the small number of schools in need which do not have a high performing school within our set geographical parameters, it is important to note that it is not the case that there is no support available, rather that it might be slightly further away.

This capacity to collaborate could and should be explored in order to maximise the potential benefits of the self-improving schools system that has evolved since 2010.

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Appendix A: Methodology

Data

Numbers and percentages of **schools by type and phase** in each Government Office Region and Local Authority are based on data from Edubase, reflecting school status as of 16 September 2016. The analysis includes all mainstream state-funded primary, secondary and all-through schools. All-through schools are included in the counts of both primary and secondary schools for analysis by phase. The analysis excludes post-16 institutions (i.e. further education colleges, sixth form colleges and sixth form centres, 16-19 academies/free schools), special schools and alternative provision.

Number and percentages of **coasting schools and schools below floor standards** are based on data from the DfE performance tables for the academic years 2013/14, 2014/15 and 2015/16. For the purpose of this analysis, current academies have been matched to their predecessors to assess attainment over time. Numbers and percentages of schools classified as requiring improvement or inadequate are based on Ofsted's monthly management information publications, with data including inspections up to 31 December 2016.

Data on **academy trusts** is available from Edubase and reflects the status quo as of 16 September 2016.

Schools in need

A school is classified as being in need of help if it is either:

- rated by Ofsted as requires improvement or inadequate; *or*
- below the floor standards (in 2015/16, or in at least two of the three academic years considered), *or*
- coasting (in 2015/16).

Where an academy falls within our definition of need, we have assumed that it is not currently in need of help if it is part of a Multi-Academy Trust. However, Single-Academy Trusts can be classified as in need of help.

Our definition of need closely follows official underperformance definitions from DfE. However, we do not apply the same exclusion criteria when identifying coasting schools or schools below the floor standards. This is because our analysis is aimed at providing a picture of the levels of underperformance across the country, and the potential sources of support available to address these issues. It is not intended to hold schools to account.

Floor standards and coasting schools

Key Stage 2

A school is classified as being below the floor at Key Stage 2 in the academic year 2015/16 if:

- The percentage of pupils meeting the expected standards in English reading, English writing and Mathematics is below 65%, **and**

- The school achieves a progress score in English reading below -5, or a progress score in English writing below -7, or a progress score in Mathematics below -5.

A school is classified as being below the floor at Key Stage 2 in the academic years 2013/14 and 2014/15 if:

- the percentage of pupils achieving level 4 or above in English reading, English writing and Mathematics is below 65%, and
- the percentage of pupils achieving the expected progress in English reading, English writing and Mathematics is below the national median for all three

A school is classified as being coasting at Key Stage 2 in the academic year 2015/16 if:

- in 2015/16, the percentage of pupils meeting the expected standards in English reading, English writing and Mathematics is below 85%, and the school achieves a progress score in English reading below -2.5, or a progress score in English writing below -3.5, or a progress score in Mathematics below -2.5.
- in 2013/14 and 2014/15, the percentage of pupils achieving level 4 or above in English reading, English writing and Mathematics is below 85% and the percentage of pupils achieving expected progress is below the national median for all three components.

Key Stage 4

A school is classified as being below the floor at Key Stage 4 for the academic year 2015/16 if:

- the progress 8 measure is below -0.5, and

- the upper bound of the progress 8 confidence interval is below zero

A school is classified as being below the floor at Key Stage 4 for the academic years 2013/14 and 2014/15 if:

- the proportion of pupils achieving 5 A*-C GCSEs (or equivalents) including English and Mathematics is less than 40%, and
- proportion of pupils achieving expected progress is below the national median for both English and Mathematics

A school is classified as being coasting at Key Stage 4 in the academic year 2015/16 if:

- in 2015/16, the progress 8 measure is below -0.25 and the upper bound of its confidence interval is below zero in 2013/14 and 2014/15, the percentage of pupils achieving 5 A*-C GCSEs (or equivalents) including English and Mathematics is less than 60%, and the proportion of pupils achieving expected progress is below the national median for both English and Mathematics

High-performing schools

For the purpose of identifying the capacity of the system to support the need to improve school performance, a school is classified as high-performing if it is not already classified as in need, and if one or more of the following is true:

- the school is rated by Ofsted as outstanding
- the school is rated by Ofsted as good with outstanding leadership
- the school is a Teaching School or a National Support School (i.e. the headteacher is a National Leader of Education)

- the school has high levels of attainment in 2015/16, at either Key Stage 2 or Key Stage 4, defined as:

Key Stage 2

- the percentage of pupils meeting the expected standards in English reading, English writing and Mathematics is within the top 25% nationally, **and**
- progress scores in English reading, English writing and Mathematics are all above zero.

Key Stage 4

- the progress 8 measure is within the top 25% nationally, and the attainment 8 score is above the national median, or
- the attainment 8 score is within the top 25% nationally, and the progress 8 measure is above the national median

Where a high-performing school is within a MAT that we classify as not being ready to expand, we exclude that school from the analysis. Please see Hillary *et al.* (2017) for the definition of readiness to expand.

Matching high-performing schools to schools in need

Our analysis shows the median number of high-performing schools at the national level, as well as in each region, Local Authority or Parliamentary constituency.

We have calculated these numbers following the steps below.

- 1) Calculate the distance of all high-performing schools from each school in need, and classify a high-performing school as available if it falls within a given radius from the school in need.

The radius depends on the rurality indicator for the school in need (available from Edubase), and is set as follows:

- 2 miles for urban schools (major and minor conurbations)
 - 5 miles for semi-rural schools (smaller cities and towns)
 - 10 miles for rural schools (rural towns and villages).
- 2) Match high-performing schools to schools in need by phase of education as follows:
 - primary schools can collaborate with other primary schools
 - secondary schools can collaborate with other secondary schools and all-through schools
 - all through schools can collaborate with primary, secondary and all-through schools.
 - 3) Calculate the number of available high-performing schools within set proximities for each school in need.
 - 4) For every level of aggregation, calculate the median number of available high-performing schools for each school in need.

We have also calculated the average and maximum distance between the nearest high-performing school and schools in need without an in-phase match based on the above parameters. The results are presented in Table 4. This shows that most of these schools would find a potential collaborator not too far outside the set radius. It is important to note that the distance shown for rural schools is derived from a very small number of occurrences, and is therefore inflated by a few relatively remote cases.

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