

Chapter 3. Adapting the school network to changing needs in urban, rural and remote areas

This chapter analyses strategies to enhance the efficiency of school networks by adapting or restructuring them in response to changing patterns of educational demand. It provides an overview of contextual trends affecting the organisation of school networks as well as the regional heterogeneities in their structure, the populations they serve, and their socio-economic context. Since rural and urban school networks tend to face different challenges and opportunities related to demographic and social trends, the chapter takes a territorial perspective and describes strategies that countries have used in both contexts in turn. First, it discusses challenges and policy options for schools in rural and remote areas, many of which are confronted with declining student populations. Then, it turns to challenges and policy options for urban school networks, which are often faced with rising student numbers and increasing student diversity.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

This chapter is concerned with the organisation of the school network and its capacity to support a high-quality educational provision. Challenges and opportunities for the efficient organisation of school facilities often vary considerably within countries due to regional heterogeneities in the school network's structure, the populations they serve, and their socio-economic context. The chapter therefore places particular emphasis on strategies to restructure or adapt the school network in light of changing and often diverging patterns of educational demand across geographic regions and different sectors of the school system. After describing the main geographic variations in OECD school systems, the chapter discusses in turn i) challenges and policy options for schools in rural and remote areas, many of which have experienced a declining population in recent decades, and ii) challenges and policy options for schools in urban areas, which are often confronted with rising student numbers, segregation and increasing student diversity. Annex 3.A includes relevant data on school transport from the OECD review's qualitative survey as well as supplementary analyses on human and material resources in urban and rural schools.

3.1. Contextual factors affecting the organisation of school networks in rural and urban areas

The challenges that authorities face in promoting an efficient organisation of their school networks are highly context dependent. Effective governance can go a long way to provide the general conditions for local and central actors to work together in rationally organising the school network (see Chapter 2). Yet, the concrete steps that authorities take to adapt the school network need to reflect regional variations and the different kinds of challenges that confront rural and urban areas in many OECD review countries. While rural school networks are, for example, frequently characterised by excess capacity, many urban schools struggle to provide enough school places to meet rising demand. As will be discussed in the following, the different kinds of mismatches between supply and demand in rural and urban school networks are only one of a range of persistent regional variations. The experience of OECD review countries as well as international assessments highlight that rural schools differ significantly in their structure, student composition and socio-economic context. Remaining sensitive to this heterogeneity when organising the school network (i.e. the location, size and offer of educational facilities) to make the most efficient use of available resources, is critical to ensure that students benefit from high-quality education regardless of their school's location.

The concepts of rurality and urbanity are complex and highly sensitive to the context in which they are employed. As in the project's country reviews, we therefore draw on national definitions when referring to country-specific examples, and on international definitions when drawing on comparative data, for example from the OECD Programme for International Student Assessment (PISA) (see Box 3.1 for a discussion).

Box 3.1. Definitions of “urban” and “rural” schools used in this report

The OECD Programme for International Student Assessment (PISA) defines the status of a school’s location based on the principals’ characterisation of the community in which it is located. The same definition is applied across all participating countries and includes five categories: villages, hamlets or rural areas (fewer than 3 000 people), small towns (3 000 to about 15 000 people), towns (15 000 to about 100 000 people), cities (100 000 to about 1 000 000 people) and large cities (with over 1 000 000 people), as well as a further distinction between villages and hamlets or rural areas (fewer than 1 000 people) in the OECD Teaching and Learning International Survey (TALIS). In line with OECD conventions, this report identifies “rural schools” in the PISA data as those in communities with fewer than 3 000 people and “urban schools” as those located in any city with more than 100 000 people, unless otherwise noted.

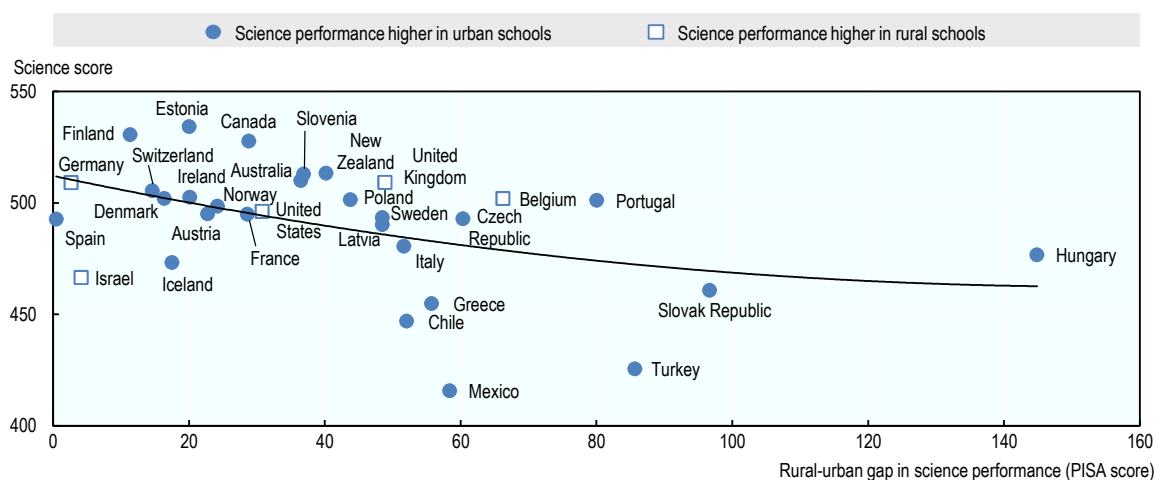
National administrations and researchers have used a variety of different definitions to capture the complex and multi-faceted concepts of rurality and urbanity, often operationalising them in terms of a community’s population size, density and/or contiguity. The National Center for Education Statistics in the United States, for example, defines rural communities as open and small settlements of less than 2 500 people that are not in the vicinity of densely populated suburban areas. Yet, the requisite data to classify schools based on these criteria are not necessarily available to all national administrations. Using a standardised definition, such as that employed by PISA, can facilitate the international comparison of results and has proven useful to evaluate student outcomes, school policies and practices in an international context. Drawing on principals’ accounts also allows the concept’s measurement at the school-level, rather than classifying entire regions based on their population density (an approach which can be useful in other contexts and has been employed, for example, in the *OECD Regions at a Glance* series).

As with any parsimonious, internationally comparative definition, the categories employed in PISA reduce a certain amount of meaningful variation and, in some cases, may risk the misidentification of individual schools. The fact that its notion of “villages, hamlets or rural areas with fewer than 3 000 people” combines two criteria (the community’s status and its population size) can, for example, lead to ambiguities where metropolitan areas contain small, administratively autonomous communities. Defining school locations based on the number of their communities’ inhabitants also makes it difficult to distinguish different types of urban locations (for example, suburban and inner-city schools) and between isolated towns and those that are part of large metropolitan areas. Neither does the definition take into account topographic features such as mountains, rivers or oceans that may impinge on a schools’ accessibility or consider a rural community’s distance to neighbouring villages, its access to public transport or the road network. As far as possible, the remainder of this chapter seeks to take these nuances into account by relying on national definitions of regional characteristics where possible and internationally comparative measurements where necessary.

Source: OECD (2017), *PISA 2015 Results (Volume III): Students’ Well-Being*. OECD Publishing, Paris, <http://doi.org/10.1787/9789264273856-en>; OECD (2016), *OECD Regions at a Glance 2016*, OECD Publishing, Paris, http://doi.org/10.1787/reg_glance-2016-en.

The PISA survey casts light on the geographic heterogeneity in students' achievement across OECD education systems. Results from 2015, for example, indicate that many of the systems that are successful in reducing geographic disparities in achievement are also the ones who manage to provide the highest quality and most equitable education overall. As indicated by the trend line in Figure 3.1, systems with a narrow rural-urban gap in science performance tend to show better academic performance across the entire system. This is congruent with studies showing that countries which close the rural-urban gap in other domains, such as infrastructure quality, are more economically successful (OECD, 2016^[1]).

Figure 3.1. The rural-urban gap and average science performance, 2015



Note: Rural schools are those located in rural areas or villages with fewer than 3 000 inhabitants, urban schools are located in cities with 100 000 inhabitants or more.

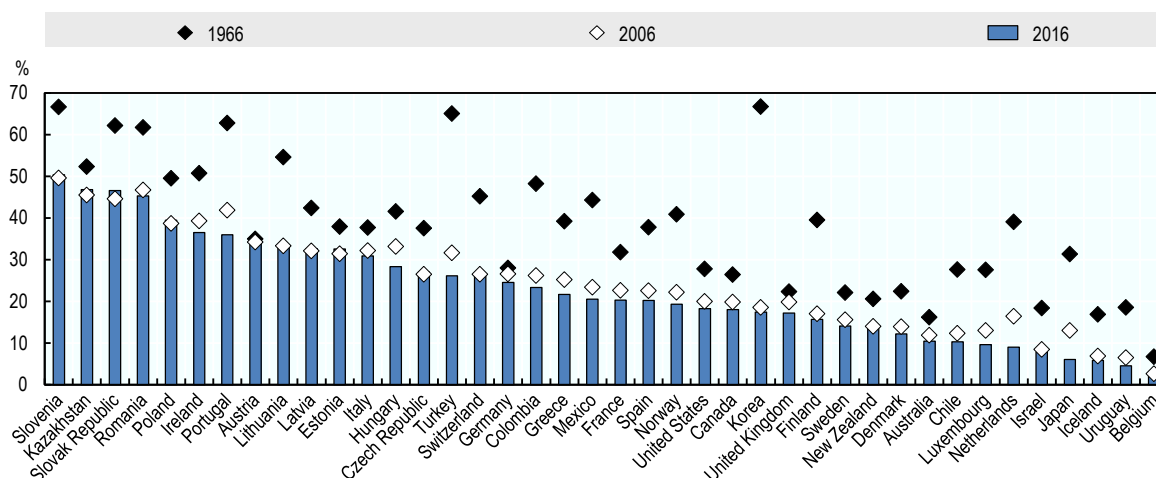
Source: OECD (2015), *PISA 2015 Database*, www.oecd.org/pisa/data/2015database/.

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While many OECD countries have grappled with a relative decline in their overall school-age population over recent decades, this trend has had distinct and often diverging manifestations at the sub-national level. Due to heterogeneous fertility rates as well as international migration and within-country mobility, many countries are simultaneously confronted with a rising urban and a dwindling rural population. This has caused unforeseen challenges for regional development in general and the provision of public services, including education, in particular.

Fuelled by productivity gains in agriculture, economies of agglomeration, lower fertility rates and increased rural-to-urban migration, populations in predominantly rural regions have been on the decline over the past 15 years in the vast majority of OECD countries (OECD, 2016^[2]). On average, about 22% of the OECD population lived in rural areas in 2016, compared to 37% fifty years earlier. While the rural population decline has slowed down in some countries over the last decade, urbanisation has continued in most of them and rapidly so in Hungary, Japan, the Netherlands, Poland and Turkey (see Figure 3.2). Much of the recent population growth in metropolitan areas has been driven by sub-urbanisation and the expansion of large cities' commuting zones, which have expanded at a faster rate than their city centres (OECD, 2016, p. 52^[2]).

Figure 3.2. Trends in the rural population share



Note: Rural population refers to people living in rural areas as defined by national statistical offices.

Source: World Bank based on the United Nations Population Division's World Urbanization Prospects (see <https://data.worldbank.org> and <https://esa.un.org/unpd/wpp/>).

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The rural population decline is particularly pronounced among younger generations. In a majority of OECD countries, only 20% or less of the children up to the age of 14 live in rural areas – a share which is even lower in the 15-29 age group as many of them migrate to urban areas in pursuit of further studies or better employment opportunities. These diverging demographic trends have important consequences for the organisation of the school network since many countries are simultaneously confronted unsustainable excess capacities in rural areas and the need to expand the provision of school places in large cities.

Participation in early childhood education and care (ECEC)

In many OECD countries, there are pronounced regional variations in pre-primary attendance. On average, students in rural areas attended almost 2.5 months less of pre-primary education than those in cities. In Estonia, Finland, and the Slovak Republic, this difference is more than six months and it rises up to one year in Poland. By contrast, in Iceland and France, rural children attend pre-primary education for longer periods than their urban counterparts. Students in schools located in towns or cities are also more likely to attend pre-primary school for any period of time than students in schools located in rural areas (OECD, 2013_[3]).

Rural-urban disparities in ECEC attendance can be due to a number of reasons: a higher rate of (maternal) employment in urban areas; rural occupational patterns and family structures that are more conducive to childcare at home; lower incomes that make it difficult for families to afford pre-schools; and limited accessibility in rural areas due to long distances. Ensuring that demand is met with adequate supply may require an expansion of provision and investments in infrastructure (Santiago et al., 2016, p. 19_[4]). Furthermore, high-quality pre-primary education depends on clear education goals, curriculum and quality standards, investment in human capital, family and community

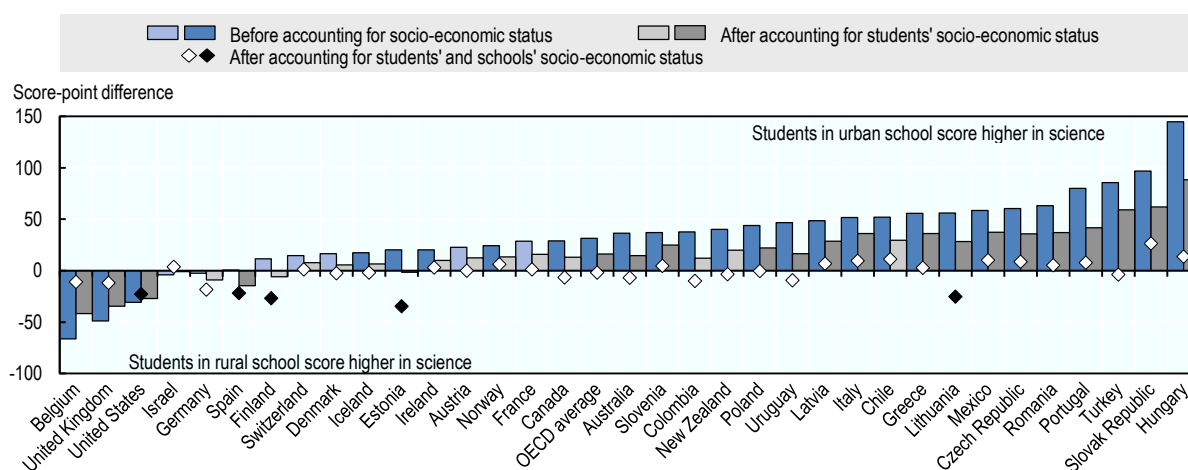
involvement as well as a commitment to continuous improvement informed by data, research and monitoring (OECD, 2011^[5]).

The importance of providing children with access to high-quality early education regardless of their place of residence is a policy priority in many OECD countries. Its importance has also been underlined by the United Nations' adoption of the Sustainable Development Goals in 2015 and the OECD's commitment to supporting its Members and the international community in their achievement (OECD, 2016^[6]). As part of Goal 4 (to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all") countries have set themselves the target to ensure by 2030, "that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education" (United Nations, 2015^[7]).

Attainment, performance and socio-economic conditions

The rural regions of most OECD countries lag behind their urban counterparts when it comes to educational achievement and attainment. PISA 2015 data indicate that, on average across OECD countries, 15-year-old students in rural areas across the OECD are almost twice as likely to have repeated a grade as students in urban schools. In addition, before accounting for socio-economic background, students in urban lower secondary schools score on average 31 points higher in science than students in rural lower secondary schools – a performance gap which is roughly equivalent to one academic year (Figure 3.3). In Chile, the Czech Republic, Hungary, Italy, Greece, Mexico, Portugal, the Slovak Republic and Turkey the gap is wider than 50 score points. However, in Belgium, the United Kingdom and the United States students in rural schools outperform those in urban schools, and there is no significant difference in several countries, including Germany, Israel and Spain.

Figure 3.3. Urban-rural differences in science performance, 2015



Note: Rural schools are those located in rural areas or villages with fewer than 3 000 inhabitants, urban schools are located in cities with 100 000 inhabitants or more. Statistically significant differences are marked in a darker tone. Countries are ranked in order of the score-point difference before accounting for socio-economic status.

Source: OECD (2015), PISA 2015 Database, www.oecd.org/pisa/data/2015database/.

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Much of this gap in academic performance can be explained by the fact that rural students tend to have a lower socio-economic profile than their urban peers in the great majority of OECD countries (Belgium and the United Kingdom being the only counter-examples) (Byun, Meece and Irvin, 2012^[8]). As shown in Figure 3.3, the gap between rural and urban students' performance decreases substantially after accounting for their economic, social and cultural status (ESCS), and disappears in most countries after accounting for both students' and schools' ESCS. This may be due to a number of factors, including the presence of significant peer effects in urban schools with higher ESCS, as well as their ability to benefit from the parents' and communities' higher level of resources.

Another, even more concerning, difference between rural schools and their urban counterparts is their students' aspiration (McDonough, Gildersleeve and Jarsky, 2010^[9]). On average across OECD countries, only 30% of students in rural schools expect to complete at least a university degree (ISCED 1997 levels 5A or 6), compared to nearly half of the students in urban schools (OECD, 2017, p. 330 Table III.6.3^[10]). Even in countries like the United Kingdom and the United States, where rural students outperform their urban peers academically, they are no more likely to expect completing a university degree and several US studies confirm an urban-rural gap in the enrolment and completion of post-secondary education (Byun, Meece and Irvin, 2012^[8]; United States Department of Agriculture, 2017^[11]).

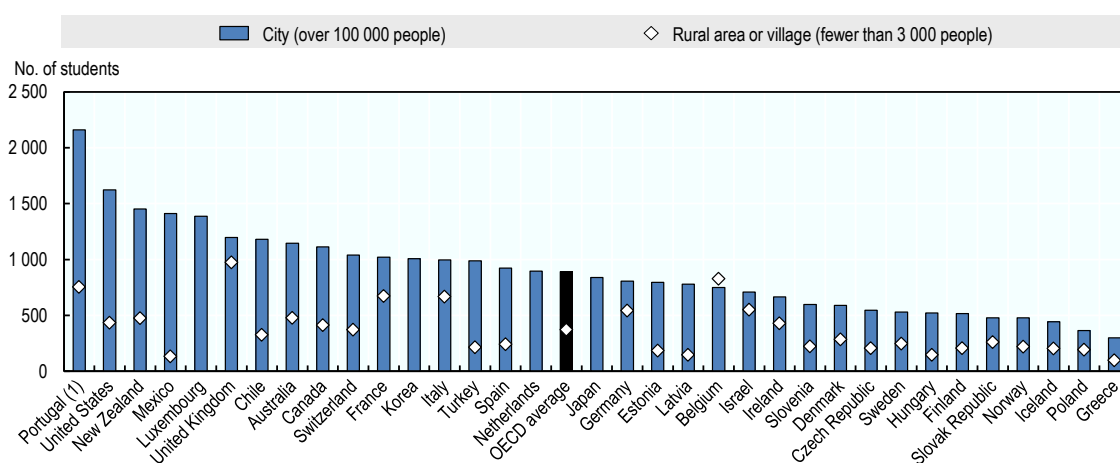
While differences in ECSC explain part of the gap in students' expectations, significant differences remain in many countries even after controlling for rural schools' lower socio-economic profile. The wider economic context, including the lack of highly-skilled jobs in many rural areas, the scarcity of specialised teachers and equipment and a narrower course offer may play a role in explaining this difference, as can the lower levels of parental educational attainment in many rural areas (Bertolini, Montanari and Peragine, 2008^[12]). As will be discussed in more depth in Chapter 4, students in rural areas also tend to face greater difficulties in their transitions to upper secondary education. Particularly in geographically isolated areas, the pursuit of further education or a specific course of study can entail long commuting distances or require rural students to migrate to larger municipalities. Of course, other aspects of children's lives in rural and urban areas, including their well-being and life satisfaction (Rees et al., 2017^[13]), and other outcomes of education need to be considered too (Levin, 2012^[14]).

Structure of the school network, facilities and resources

Urban and rural school networks also tend to differ considerably with regards to the size of their constituent schools, the facilities and teaching materials at their disposal as well as their ability to match capacities to reflect local demand. In all OECD countries other than Belgium, 15-year-olds in cities of over 100 000 inhabitants attended significantly larger schools than those in rural areas or villages with fewer than 3 000 inhabitants (OECD, 2016^[15]). On average, rural schools had an enrolment of 369, compared to 890 in urban schools (see Figure 3.4), with particularly large differences observed in countries such as Mexico and the United States where the average urban schools enrol at least 1 000 students more than the average rural school. Differences of similar magnitude can be observed in Portugal between urban and rural organisational units (comprising both independent and clustered schools). Nevertheless, due to their demographic decline, rural areas in many OECD countries exhibit over-capacity, while cities are frequently confronted with excess demand (Nusche et al., 2016^[16]; Nusche et al., 2015^[17]).

Despite the smaller average size of rural providers, the school network tends to have a lower density in rural areas than in cities or suburbs and private providers tend to concentrate their offer in urban areas. In Spain, for example, only 4% of rural students attend a private school, compared to 51% of urban students (OECD, 2016, pp. 458, Tables II.4.11 and 4.12_[15]). As a consequence, rural families are often faced with few options when choosing a school for their children. Many rural families only have one primary school within reasonable distance from their home and according to PISA 2015 data, only 38% of rural 15-year-olds' families reported that their school had competition from at least two other providers, compared to 71% of urban families (OECD, 2016_[15]) (see Figure 3.8). While consolidation has often been proposed as a means to increase the size, improve the resources and broaden the educational offer of the remaining rural schools, it is also clear that such measures can further reduce the diversity of schools and parents' ability to choose between multiple providers or course offers (Gronberg et al., 2015_[18]).

Figure 3.4. School size in rural and urban areas, 2015



Note: Countries and economies are ranked in descending order of the number of students per urban school. Missing values signify insufficient observations to provide reliable estimates (i.e. fewer than 30 students or fewer than 5 schools with valid data). Rural schools are those located in rural areas or villages with fewer than 3 000 inhabitants, urban schools are located in cities with 100 000 inhabitants or more.

1: Number of students refers to school clusters (see *PISA 2015 Technical Report*, Table 4.3).

Source: Based on OECD (2016), *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264267510-en>, Table II.6.7

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Given that rural schools – particularly in systems that allocate funding based on enrolment – tend to have smaller operating budgets and need to spend a larger proportion of them on staff and transport costs (Showalter et al., 2017_[19]), one might suspect their infrastructure and facilities to be of a lower standard than those of urban schools. Yet, in contrast to most lower- and upper-middle-income countries that participated in PISA 2015, rural principals in OECD countries were, on average, no more concerned about their equipment than those in urban schools (OECD, 2016_[15]). In several cases, including the OECD review countries Denmark, Belgium, Iceland, Slovenia and Uruguay, rural principals even reported fewer concerns about the quantity or quality of

their schools' physical infrastructure and teaching materials than their urban colleagues. In Australia, Ireland, Norway, Mexico, France and the United Kingdom, by contrast, rural principals were more likely to report that the state of their schools' material resources was a hindrance to instruction (Annex Table 3.A.2).

When it comes to teaching materials required for specialised courses, such as laboratories for science classes, the principals of urban schools report to be better equipped than their rural peers in 14 OECD countries. This most likely reflects larger schools' ability to benefit from economies of scale, as well as the availability of specialised teachers and staff, such as lab assistants hired to maintain these facilities. Conversely, rural schools tend to have a higher number of computers per student, although this may reflect their smaller class size and dependence on ICT-supported instruction and distance education (Annex Table 3.A.2). They also often benefit from access to outdoor spaces and may face fewer constraints when offering their students related activities than schools in high-density urban areas.

3.2. Challenges and opportunities for the efficient and equitable provision of education in rural areas

Over the past decades, the rural education landscape has undergone a considerable transformation across OECD countries. Where one-room schools with a single teacher were once the norm, increased government spending, rural economic development, improved connectivity and higher expectations have made larger schools with multiple classrooms, teachers and grades, and a greater variety of learning opportunities the new standard (Egelund and Laustsen, 2006^[20]). Nevertheless, many of the challenges that traditionally confronted rural school networks remain highly salient and new ones have emerged. Shrinking student numbers, limited access to qualified and experienced teachers and a relatively high proportion of disadvantaged students make the efficient provision of high-quality education in rural areas a difficult undertaking. On the other hand, in some countries, a high level of voluntary involvement, tight-knit communities and the intimacy of small schools and classes provide opportunities that successful rural school networks might capitalise on.

Despite the tremendous diversity in rural topographies as well as their economic, social and cultural characteristics, there are some commonalities that impact the quality and cost of delivering education and other public services in rural areas. These include first and foremost the remoteness of many rural service recipients, which increases the cost of transport, communication and training as well as a low population density, which makes it more difficult to take advantage of scale economies and network effects (OECD, 2010^[21]). Of course, it is important to stress the difficulty of defining rural, suburban and urban areas. Transitions between them can be gradual and some inner-city neighbourhoods may have more in common with rural communities than with other locations in the same city (Burdick-Will and Logan, 2017^[22]). Likewise, remote rural schools are likely to experience greater difficulties in providing a rich educational offer than those located at the margins of an urban centre (Greenough and Nelson, 2015^[23]). Nevertheless, the challenges described above are widespread features of rural education, even though they are not exclusive to or experienced by all rural areas (Centre for Education Statistics and Evaluation, 2013^[24]).

In addition, the challenges encountered by small schools in rural and remote areas are often exacerbated by the limited capacity and resources of local authorities. In many school systems, local governments assume some responsibilities related to, for example,

the hiring of teachers, overseeing the instructional quality of their schools, co-ordinating resource sharing or consolidation initiatives, ensuring access to professional services for students and teachers, organising transport services, etc. Particularly in rural areas with many small schools, municipalities may lack the capacity and resources to effectively assume these responsibilities and offer their schools adequate support (Santiago et al., 2016, p. 93^[25]). In 2009, rural schools in 8 of 32 OECD countries had less autonomy in the allocation of resources than urban schools, while the opposite was true in 4 countries (OECD, 2013^[26]).

A high degree of regional variation in local capacity can also be a challenge for the effective delivery of central initiatives and policies. Smaller rural municipalities, for instance, may not have the staff, time or experience to apply for central grants, which can reinforce existing regional inequities (OECD, 2017^[27]). Likewise, the design of central policies often fails to account for the vastly different contexts in which schools are embedded and the different needs that arise from them. Although rigorous piloting schemes and impact evaluations are increasingly used for evidence-based policy making, schools in small rural districts tend to be markedly underrepresented if not excluded from many rigorous evaluations, even where they comprise a significant share of the students impacted by potential policy changes (Stuart et al., 2017^[28]). The moderating effect of school locations on the tested interventions' impact thus risks being overlooked.

Small school size can be an obstacle for the efficient provision of rural education

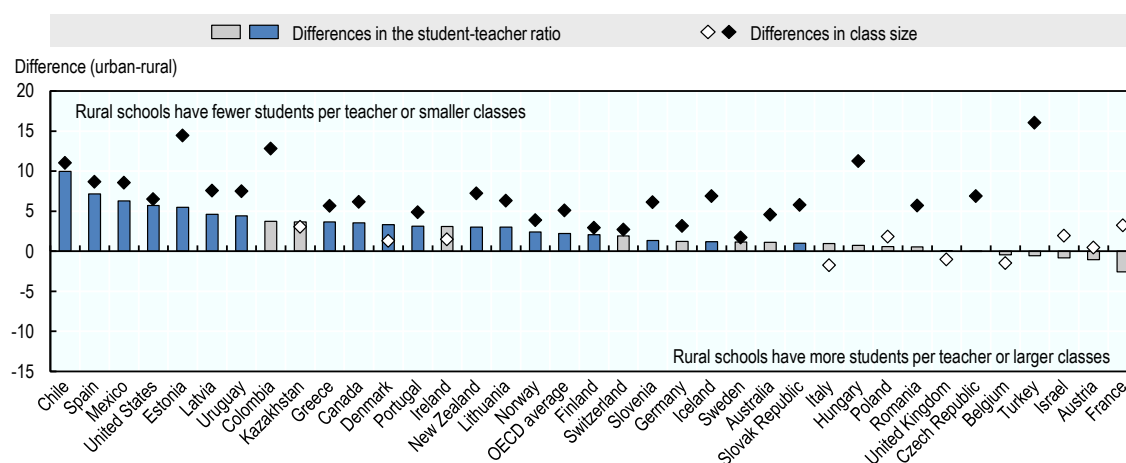
As mentioned above, one of the biggest challenges for the efficient operation of rural schools is their small size and the low population density of their surrounding areas. There is no universal agreement among policy makers or researchers on what constitutes large, medium-sized or small schools in any given context. In the research literature, definitions of large schools, for instance, range from those with 800 students or more to schools with more than 2 000 and even 3 200 students (Leithwood and Jantzi, 2009^[29]). Administrative standards and conceptions of what constitutes an adequate school size also vary depending on the level of education, a school's location and its particular offer (Ares Abalde, 2014^[30]).

Yet, regardless of where the precise boundary is drawn between small and large schools, research from different countries indicates that expenditure per student is highest in the smallest schools (Falch, Rønning and Strøm, 2008^[31]; Østergaard Larsen, Houlberg and Schindler Rangvid, 2013^[32]) and that significant economies of scale can be achieved when increasing school size up to a certain enrolment level before returns to scale diminish or diseconomies of scale may emerge (Ares Abalde, 2014^[30]). One of the reasons why schools can reduce per-student cost up to a certain size is the reduction of per-student fixed costs associated with administrative work, constructing, running and maintaining school facilities.

Another reason for the cost efficiency of larger schools is their ability to fill classes up to the maximum permitted number of students (Knoth Humlum and Smith, 2015^[33]). Partly due to their small size and demographic decline, rural schools tend to have smaller classes and fewer students per teacher than their urban counterparts, which can exert considerable pressure on public resources. As shown in Figure 3.5, the average secondary rural school in OECD countries has five fewer students enrolled in language-of-instruction classes and about two fewer students per teacher. In not a single education system are the class sizes or student-teacher ratios of rural schools significantly higher than those of urban schools.

Particularly in systems where central funding for schools is tied to the number of students they serve, a low student-teacher ratio may require municipalities to contribute significantly to the cost of maintaining small local schools.

Figure 3.5. Differences in rural and urban schools' student-teacher ratio and class size, 2015



Note: Statistically significant differences are marked in a darker tone. Rural schools are those located in rural areas or villages with fewer than 3 000 inhabitants, urban schools are located in cities with 100 000 inhabitants or more.

Source: OECD (2016), *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools*, PISA, <http://dx.doi.org/10.1787/9789264267510-en>, Tables II.6.29 and Table II.6.30.

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There is some evidence of a U-shaped relationship between school size and per-student costs and that the cost of high-quality provision may increase once schools surpass a certain size, which varies depending on the level of education. Andrews, Duncombe and Yinger (2002^[34]), for example, find that moderately sized elementary schools (300-500 students) and slightly larger high schools (600-900 students) are well-placed to balance economies of size with the disadvantages that may accompany very large institutions, such as increasing administrative complexity. However, studies tend to consider a narrow set of student outcomes and few if any take into account negative externalities, such as increased travel time, that may arise when school size is increased through consolidation (Ares Abalde, 2014^[30]).

The size of a school can impact a wide range of student outcomes and can have both advantages and drawbacks for the experience of students and teachers. Evidence on the effects of school size on student outcomes is mixed (OECD, 2016, p. 190^[15]) and its impact can be moderated by contextual factors such as pedagogical techniques, student composition, and school resources. Although relationships are therefore variable across countries, students in larger schools benefit from better equipment on average. After accounting for the socio-economic profile of students and schools, out of a total of 67 education systems, there are still more systems (30) in which the relationship between school size and science performance is positive than those (5) where it is negative (OECD, 2016, pp. 192, Figure II.6.5^[15]).

In other respects, smaller schools may be at an advantage. They are often argued to allow for more interaction among school staff, parents and students, foster a greater sense of belonging and facilitate the exchange between students of different ages. Based on results from the PISA study, students in smaller schools report a better disciplinary climate in their science lessons and are less likely to skip days of school or arrive late than students in larger schools, controlling for socio-economic status, the level of education and science performance (OECD, 2016^[15]).

The smaller class size found in many small and rural schools has also been associated with a number of advantages since it may allow teachers to devote more attention to individual students' needs and personalise their instruction accordingly. According to students' reports across OECD countries, teachers in smaller classes are somewhat more likely to adapt their teaching to the students' needs and abilities than teachers in schools with larger class sizes, and teachers in rural schools also more frequently give students extra help when they need it than teachers in urban schools (OECD, 2016^[15]). Both of these teaching characteristics are associated with higher student performance (OECD, 2016^[15]) and some studies suggest that particularly students in the early grades and those with a lower socio-economic profile benefit from smaller class and school sizes (Piketty, 2004^[35]; Dynarski, Hyman and Schanzenbach, 2013^[36]; Leithwood and Jantzi, 2009^[29]).

Not all rural schools can provide a comprehensive educational offer with adequate depth and breadth to meet their students' needs

Many small schools, and by extension rural school networks, face difficulties in providing an educational offer with sufficient depth and breadth to match the teaching environment and learning experience of larger schools. Small schools may lack the teacher resources or student numbers to provide specialised course options and after-school activities to meet their students' interests and needs (Ballou and Podgursky, 1995^[37]). Likewise, small rural schools often struggle to provide specialised educational opportunities, for example for special needs students (Berry et al., 2012^[38]) and academically gifted individuals (Puryear and Kettler, 2017^[39]). As a result, parents of children with special needs in rural settings more frequently decide to complement the regular school instruction with home schooling (Schafer and Khan, 2017^[40]). Due to the lower volume and variety of economic activity in rural areas, vocational schools may also be limited to providing work-study programmes in specific sectors like agriculture or tourism. Even though evidence shows that not all students benefit from curricular diversity in the same way, a narrow educational offer can also lower rural schools' attractiveness for prospective teachers (Halsey, 2017^[41]).

Limitations in the offer of small, rural schools extend beyond the academic curriculum and include supplementary services for struggling students and those with specific learning needs. While rural schools tend to have fewer space constraints than urban and suburban schools, they often face challenges when trying to find the specialised staff or subcontractors necessary to offer services for students with special educational needs (SEN) due to their location (Sipple and Brent, 2015^[42]). In the United States, for example, federal and state authorities require some schools to provide services which small rural districts may face difficulties to offer.

Rural schools cannot benefit from the same economies of agglomeration and the proximity to urban facilities as their metropolitan counterparts (Rogers, Glesner and Meyers, 2014^[43]). Taking part in attractive afternoon activities, science clubs, cultural events or sport activities may therefore require students in rural areas to travel at a

considerable logistical and financial cost. Even at the secondary level, where schools tend to be larger, students in rural areas are not exposed to the same extracurricular opportunities as their urban peers. On average across OECD countries, for instance, 29% of 15-year-old students enrolled in rural schools are offered a science club as a school activity, compared to 41% of students enrolled in urban schools (OECD, 2016^[15]). Similar limitations have been observed regarding remedial classes and language support for recently arrived migrants (Centre for Education Statistics and Evaluation, 2013^[24]). At the same time, some studies report that after-school activities in larger schools are often overcrowded, and that the participation in these activities can be more equitably distributed in smaller schools (Leithwood and Jantzi, 2009^[29]).

Since neither textbooks, nor curricula tend to be adapted to the challenges of small schools, teachers – particularly those relying on multi-grade instruction – are often required to cover the material of multiple grade-specific programmes in a fraction of the allotted time (Mulryan-Kyne, 2007^[44]). The challenge for rural schools is thus to strike an appropriate balance between different competing demands and expectations for a curriculum while maintaining a strong focus on fundamental elements like literacy and numeracy (Halsey, 2017^[41]). This highlights the importance of giving rural schools sufficient support and pedagogical autonomy to adapt central curricula to their capacity while at the same time meeting their students' learning needs (Halsey, 2017^[41]).

Similar concerns arise not only regarding the quantity of material prescribed by national curricula, but also their content and the question whether the educational offer is sufficiently adapted or applicable to the needs and realities of students in rural areas. Without compromising training on such basic skills as numeracy and literacy, teachers in rural schools may benefit from opportunities to design and adapting curricula based on relevant and local examples (Shin, Iyengar and Bajaj, 2013^[45]). A narrow or ill-adapted educational offer and the limited availability of quality equipment and materials can significantly compromise the quality of learning environments provided in small schools and threatens to undermine the benefits that might otherwise accrue to rural schools due to their lower student-to-teacher ratios (Santiago et al., 2016, p. 97^[46]).

Some rural schools face difficulties in attracting and retaining qualified personnel

The quality of teachers is a critical, if not the most important determinant of students' educational experience (Hattie, 2009^[47]; Gershenson, 2016^[48]; Jackson, 2012^[49]). Ensuring that rural schools have access to qualified, prepared and motivated teachers is therefore essential to give rural students the same opportunity to realise their potential as their urban peers (OECD, 2005^[50]). Yet, many rural schools face difficulties to recruit teachers in certain subject areas and to prepare them to teach effectively in a rural context (Monk, 2007^[51]). Evidence from the United States points to a low degree of geographic mobility among teachers (Reininger, 2012^[52]) and a strong impact of location preferences in their job search (Engel, Jacob and Curran, 2014^[53]). This strong regional dimension of the teacher labour market can create supply shortages for schools in both rural and disadvantaged urban areas. Combined with the limited opportunities for professional development and peer-support in some isolated areas, their frequently reported retention problems, and the limited budgets of small schools, shortages of qualified teachers can aggravate the efficiency concerns of rural school networks.

Results from PISA 2015 and TALIS 2013 show that, on average across OECD countries, rural science teachers are somewhat less likely to have completed a relevant university degree than urban ones and that rural teachers are less likely to have attained a university qualification in general (OECD, 2014, pp. 276 ff., Table 2.13^[54]). In contrast to some of the lower- and upper-middle-income countries that participated in PISA, however, these differences are modest and there are only four OECD countries in which rural school principals are more concerned about a lack of teaching staff than their colleagues in cities and three countries in which they are more concerned that their teachers' qualifications might be a hindrance to instruction (Annex Table 3.A.3). At the same time, on average across the OECD and particularly in countries such as the Czech Republic, Estonia and the Slovak Republic, rural teachers more frequently report having to teach subjects for which they did not receive formal training on content, pedagogy or classroom practices¹.

Many initiatives aimed at improving the quality of teaching, such as the application of education theory in classroom settings from the very start of a teacher's career, are likely to benefit rural schools as much as they do their urban counterparts. Yet, in light of their small size, limited resources and social context, effective teaching in rural schools may require teachers to employ specific pedagogical techniques to effectively address their students' needs. The small number of students and teachers in rural schools, particularly in primary education, influences how schools can organise their instruction time and group students by grades or abilities. Many rural schools therefore rely on specific pedagogical practices to make efficient use of their limited resources, including multi-grade teaching.

While recent internationally comparable data on the occurrence of multi-grade teaching is not readily available, reports from individual countries and regions suggest that it remains a common practice in rural areas and in exceptional cases also in urban schools. An evaluation from New South Wales (Australia), for example, suggests that half of all students in rural public primary schools and nearly 90% of those in very remote schools were taught in multi-grade classes in 2012 (Centre for Education Statistics and Evaluation, 2013^[24]). Likewise, in Ireland, just under a quarter (24%) of all primary students were taught in multi-grade classes combining two grades and 8% were taught in classes made up of three or more grades in 2010/11, even though their proportion has declined since the early 1990s (Quail and Smyth, 2014^[55]).

Early meta-analyses of empirical studies have yielded mixed and inconclusive results concerning the cognitive and non-cognitive effects of multi-grade and multi-age teaching (Veenman, 1995^[56]). Some of these ambiguities may have been due to the failure to control for selection effects (Mason and Burns, 1996^[57]), classroom composition and heterogeneity across student groups. More recent studies, for example, suggest that the effects of multi-grade teaching differ based on students' gender. While they found few overall differences between the outcomes of students taught in single-grade and multi-grade classes, Quail and Smyth (2014^[55]) find Irish nine-year-old girls to experience a range of negative effects on their achievement and behaviour when paired with older peers. In a study of rural junior high school students in Norway, Leuven and Rønning (2016^[58]) also found heterogeneous effects based on age and classroom composition. While younger students were demonstrated to benefit from the presence of older peers in multi-grade settings, sharing a classroom with younger peers was found to have a negative effect. While the two effects cancel each other out at the aggregate level, especially the negative impact on older students lasted until the time of high school graduation and college entry.

In any case, it is clear that the effects of multi-grade teaching are highly dependent on the preparation and the support teachers receive when working in these challenging circumstances. Ameliorating negative effects on students' behaviour and achievement may require developing innovative ways to engage students, manage classroom interaction and discipline, and provide constructive feedback. This, in turn depends on the availability of adequate professional training and peer-exchange, providing teachers with sufficient time and support for the preparation of classes (Mulryan-Kyne, 2007^[44]) and ensuring the supply of instructional materials and textbooks that facilitate self-guided learning (McEwan, 2008^[59]). Given that multi-grade teaching may not feature in the initial teachers' education, countries relying on small schools with multi-grade classes should reflect on ways to incorporate corresponding pedagogical techniques into their professional development (Santiago et al., 2016, p. 97^[46]).

Giving prospective rural teachers an opportunity to gain pre-service experience in rural schools can allow them to build relationships with the providers and gain a realistic understanding of what it is like to live and teach in a rural community, which may increase their likelihood to stay later on (Halsey, 2017^[41]). Effective partnerships and feedback loops between rural schools, teacher education institutions and education authorities can also help to inform the design of teacher education programmes and increase their relevance for rural contexts (Yarrow et al., 1999^[60]).

Some of the challenges related to the preparation and retention of teachers in rural schools could be eased by providing appropriate opportunities for continuing professional development (Fowles et al., 2014^[61]). In many OECD review countries, however, this kind of training is limited in small rural schools, partly due to the cost of delivering it in isolated areas (OECD, 2010^[62]). According to PISA 2015 data, in-house professional development activities, are less frequently provided in rural schools, even though principals in urban and rural secondary schools report that a similar share of their teachers participate in some professional development activities (Annex Table 3.A.3). Being part of a small teaching staff with limited opportunities for peer-learning, collaboration and feedback can also result in rural teachers feeling isolated from their professional community (Stern, 1994^[63]; Ares Abalde, 2014^[30]). This threatens to affect the quality of their work, their professional satisfaction and ultimately adds to the challenge of retaining high-quality personnel in rural schools.

Countries have employed a range of strategies to address rural teachers' professional isolation and provide high-quality professional development opportunities at a reasonable cost (Halsey, 2017^[41]). These include cascade teaching (training a group of teachers to coach their colleagues in a particular skill), mobile facilitators, induction and mentoring, and the use of local resource and support centres. The creation of school and teacher networks has also been used to provide educators with forums to discuss and solve problems they encounter in their daily practice, to provide them with ongoing feedback and support, and to encourage teachers to remain in rural schools (Centre for Education Statistics and Evaluation, 2013^[24]). The effectiveness of such collaboration efforts hinges on their ability to guide participants in their continuous improvement, the leadership necessary to distribute roles and responsibilities, and the availability of spaces and common rules that can foster a shared identity (Jensen, 2012^[64]; Alcázar and Ortiz, 2011^[65]).

In the United States, some school districts with difficulties to attract qualified teachers have sought remedy in the provision of financial incentives such as loan-forgiveness programs, low-rate mortgage loans, or signing bonuses for teachers who commit to enter

the local teaching profession. Other districts have launched so-called “grow your own” initiatives that target local high school students and raise their interest in the teaching profession by providing them with opportunities to volunteer in schools or with structural support to take up post-secondary education (Reininger, 2012^[52]).

3.3. Strategies to adapt rural school networks with excess capacity

The way in which a school network is organised (i.e. the location, size and structure of its physical infrastructure, the use of facilities and the distribution of educational services across school sites) can have a significant impact on a school system’s efficiency. Particularly in areas that are characterised by excess capacity and falling educational demand, adapting the school network to tap into economies of scale, generate synergies and align the provision of services with local and regional needs has the potential to improve educational quality while generating significant savings.

The process of adapting rural school networks to falling demand has conventionally been associated with consolidation: many OECD countries have sought to address the declining efficiency of their rural school networks by closing and relocating the students of schools that are no longer deemed financially viable. Managing the trade-offs between maintaining smaller community schools or larger, but more distant facilities has therefore been a central challenge in adapting rural school networks. Given the administrative complexity of school closures, their strong impact on the lives of students and local communities, as well as the risk of unintended consequences for student learning and well-being, many have come to see consolidation as a last resort.

Over the past decades, the repertoire of strategies to rationalise the school network has been greatly expanded to extend beyond the construction, merger or closure of schools. Many systems now place increasing emphasis on informal and formal co-operation, resource sharing between schools as well as modular approaches that focus on expanding or reducing specific services offered in schools and reorganising grade levels or types of provision across school units (Santiago et al., 2016, p. 104^[4]). These approaches, alongside conventional consolidation and rationalisation strategies, will be discussed below, focussing on their respective applicability, benefits and drawbacks in response to specific challenges.

Many OECD countries have a strong commitment to providing younger students with educational opportunities close to their homes while expecting rural students at higher levels of education to commute longer distances. This is one of the reasons why, in PISA 2015, the share of students enrolled in rural schools therefore decreases substantially between lower and upper secondary education.² In the Slovak Republic, for example 36% of lower secondary students are enrolled in rural schools, compared to only 1% of upper secondary students. Similarly large differences can be observed in Chile, the Czech Republic, Hungary, Mexico, Slovenia and Turkey.

There are economic, administrative and normative reasons why upper secondary education tends to be more centralised. On the one hand, there is a strong case to be made for providing primary education close to students’ homes. Since young students may lack the independence to travel on their own, suffer from the strain of long commuting times or feel uncomfortable attending a school that is removed from their familiar environment. On the other hand, delivering the greater variety of courses and more specialised curricula of upper secondary education requires more teachers and students as well as facilities and

learning material that are often impossible to provide at the scale of the average rural school.

Another reason for the greater decentralisation at the primary level is that the administrative responsibility for primary schools more frequently lies with local authorities, which tend to be strongly committed to keeping primary schools open since they perceive them to be essential for the community's attractiveness to young families. Even where local authorities are committed to consolidation, administrative fragmentation can make it difficult to plan the shared use of facilities across municipal boundaries. It is therefore important to bear in mind that there are limits to the rationalisation of ECEC and primary education networks while the greater scope for consolidation or other forms of rationalisation may be greater at the upper and sometimes lower secondary levels.

Adapting how education levels are defined and distributed across school units

Taking a modular approach to the distribution of educational services across school units and adjusting their grade configuration can generate opportunities for the targeted rationalisation of the school network without requiring the closure of entire institutions (Santiago et al., 2016, p. 104^[4]). Most countries follow specific conventions based on regulations or traditions when it comes to the way in which different grade levels or types of provision are combined in and distributed across school facilities. Allowing for some flexibility in the combination of different grade levels within institutions and preparing schools to teach effectively under these conditions can make it easier to adapt the school network in response to changing levels of demand. This is particularly true where contextual developments generate different kinds of pressures at different levels of education.

In the Czech Republic, for example, primary and lower secondary education are commonly combined in “basic schools”, which means that even small municipalities with few students tend to provide lower secondary education. Following the introduction of a compulsory year of pre-primary education, the system was expected to experience capacity shortages at the pre-primary level, while the decreasing school-age population generated consolidation pressures at the lower secondary level. In order to respond to these challenges effectively, the OECD review team recommended pursuing a modular approach to the school network and reconsidering the combined provision of primary and lower secondary education. Removing lower secondary education from selected basic schools could allow for their consolidation while freeing up capacity to expand the provision of rural ECEC (Shewbridge et al., 2016, p. 84^[66]).

Confronted with similar challenges, Estonia opted for a more decisive separation between general upper secondary education and basic education with the aim to consolidate the upper secondary school provision while leaving the network of lower secondary schools largely intact. Combined with the construction of centralised state-run upper secondary schools, the government thereby sought to initiate a reflection among municipal authorities on the levels of education that they can adequately provide at the local level (Santiago et al., 2016, p. 75 f.^[25]).

Co-operation and resource sharing between independent schools

Pooling resources through horizontal co-operation can allow schools and local authorities to increase their efficiency without requiring fundamental changes to the structure of the school network, i.e. leaving the number, size and distribution of school facilities intact.

This can involve the joint provision of specialised programmes; sharing human resources, facilities and back-end infrastructure; jointly purchasing materials or services; co-ordinating student transport; or making professional development training available to teachers from multiple schools. In practice various structural, legislative and cultural barriers can impede schools from fully realising the potential of voluntary collaboration. Regulations, for example, can make it difficult for specialised teachers to offer courses to schools in small rural communities in person or via videoconferencing. Likewise, the design of funding mechanisms can create disincentives or reduce schools' flexibility to share teaching staff and other resources. Identifying and reducing these obstacles can therefore be an important first step towards greater co-operation and resources sharing.

Co-operating with other providers can allow small schools to benefit from economies of scale and scope that enhance the efficiency of their operation and give their students access to educational opportunities they might not otherwise enjoy. While economies of scale in education are conventionally pursued with a view to reduce per-student costs by increasing the scale of service provision or purchases, economies of scope promise to reduce costs and overcome weak local demand by providing a broader range of services jointly, in collaboration or in greater proximity to one another. Providing multiple services in the same physical location can increase their efficiency if it permits schools to pool overhead costs related to energy, security or administrative expenses. It can also reduce the travel cost incurred by students and parents since it allows them to save money and time by combining trips (OECD, 2010, pp. 38, 41 ff.^[62]).

Different forms of formal and informal co-operation

Co-operation between schools can take various forms, varying in their degree of formality, duration, scope and the policy levers through which they are facilitated. As discussed in Chapter 2, the likelihood for schools and local authorities to engage in voluntary collaboration and resource sharing in the absence of regional or central co-ordination depends on a range of factors. These include local capacity, the absence or presence of incentives, traditions of collaboration and pre-existing structures that facilitate horizontal co-ordination. Likewise, the success of collaborative practices in addressing the challenges of rural schools is subject to a number of conditions. Long distances between schools and a low level of trust between school leaders – especially in contexts where schools are competing for students – can act as barriers to resource sharing, while clearly established goals and a focus on mutual benefits can form a basis for successful and sustained collaboration (Muijs, 2015^[67]).

Existing structures of co-ordination and co-decision making can provide a basis on which to mount an effective exchange of practices, share facilities or resources, and overcome professional isolation. Evidence from initiatives in countries like the United Kingdom, Finland and Sweden shows that a culture of school-to-school partnerships can contribute to raising student performance and making schools more efficient (Pont, Nusche and Moorman, 2008^[68]; Muijs, 2015^[67]). However, many countries lack a history of inter-school collaboration or established platforms that bring principals together to engage in sustained inter-school collaboration (Santiago et al., 2016, p. 189^[46]). In such contexts, local or regional authorities can play a facilitating role and help principals move beyond ad hoc or short-term collaboration and towards more sustained resource sharing practices.

The school associations established in the Flemish Community of Belgium provide a good example of collaborative platforms that promote cost savings across schools by allowing them to share resources and rationalise their course offer (see Box 3.2). While the formation of and participation in school communities is voluntary, the government provides incentives in the form of additional staff resources that can be shared between the schools of an association. School associations are also free to adjust the scope of their collaboration based on their respective needs, ranging from communities with low-intensity co-operation on selected issues to those that share a wide range of services and resources (Nusche et al., 2015, p. 114^[17]).

Box 3.2. School associations in Belgium (Flemish Community)

In 1999, the authorities of the Flemish Community of Belgium launched a policy to encourage school collaboration through the establishment of “school associations” (*scholengemeenschappen*) among secondary and, since 2003, primary schools. School associations are collaborative partnerships between schools in the same geographical area comprising between 6 and 12 schools on average. In 2010, the vast majority of schools (96.7%) belonged to a school association, and most of those that did not were special needs schools. Particularly at the secondary level, a central goal of the initiative was to improve the efficiency of schools’ resource use and their offer of programmes through increased co-operation and co-ordination. In an evaluation of school associations, the Belgian Court of Audit (2010^[69]) concluded that their introduction had significantly reduced the duplication of courses offered by schools of the same association.

Membership in a school association is voluntary, and to incentivise schools’ collaboration in a system that is otherwise based on school choice and competition, the Flemish Ministry of Education and Training provides additional staff and other resources whose use the association can collectively decide upon. In practice, school associations receive a number of points for management and support staff and – in the case of secondary schools – teacher hours, which they can redistribute among the associated schools based on an internally agreed repartition system (Flemish Ministry of Education and Training, 2015^[70]). In elementary education, some of these points may be used to appoint a co-ordinating director of the school association, and in secondary education, the school association can retain up to 10% of the points to fund its operations.

In the most successful cases, school associations have also brought about greater effectiveness and efficiency through the use of shared management systems for staff recruitment and evaluation, easing their principals’ managerial and administrative burden and allowing them to assume greater pedagogical leadership. Evaluations of secondary school associations also showed that many of them have developed common personnel policies that facilitate sharing human resources across schools and jointly providing parts of their curricula (Pont, Nusche and Moorman, 2008^[68]).

Source: Nusche, D., et al. (2015), *OECD Reviews of School Resources: Flemish Community of Belgium 2015*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264247598-en>; Pont, B., Nusche, D., & Moorman, H. (2008), *Improving School Leadership, Volume I: Policy and Practice*, OECD Publishing, Paris, <http://doi.org/10.1787/9789264044715-en>.

Collaborative service provision and joint purchasing

Particularly for small schools, sharing specialised teachers and expensive mobile equipment can offer a means to expand the breadth and depth of their educational offer. In rural France, schools have therefore been encouraged to organise themselves in networks since the 1970s, allowing many small schools that might have otherwise been unsustainable to remain open. Since 1998, municipalities have stepped up their involvement in this co-operation and enabled their schools to offer services like transport, internet access, and extracurricular activities together. This type of collaboration relies on the relative spatial proximity of small providers to avoid spending excessive time and resources on the transport of teachers, students and materials between schools (Giordano, 2008, p. 37^[71]).

In Spain, partnerships between rural schools, called “Grouped Rural Schools” (*Colegios Rurales Agrupados*, CRA), have served as a means to overcome the resource constraints faced by small schools since the late 1980s. Participating schools from multiple municipalities share peripatetic teachers, instruction materials or extracurricular offers and combat their teachers’ professional isolation through regular co-ordination meetings. In Catalonia, one of the autonomous communities in Spain, the initiative has been pursued under the name of “Rural Education Zones” (*Zona Escolar Rural*, ZER). The schools of a ZER are independent of each other but share a common educational project and curriculum. Each ZER is co-ordinated by a leadership team including one of the participating schools’ principals, a chief of studies and a secretary, which dedicates 25 weekly hours to co-ordinating and directing the ZER. Each ZER has a school council composed of representatives of the school management, teachers, administrative and service staff, parents, and the municipality where the schools are located. The schools of each ZER share at least three peripatetic teachers offering instruction in a foreign language, music and physical education. Larger ZERs, comprising seven or more schools hire a fourth peripatetic teacher to provide special needs education. Usually, these teachers focus their instruction on one school each day to avoid excessive travelling between schools and they usually meet every two weeks to plan school activities and overcome the sense of professional isolation prevalent in small rural schools (Ares Abalde, 2014, p. 30^[30]).

Vocational education and training (VET) is another sector in which providers can generate considerable savings from collaboration between schools (see also Chapter 4). Particularly in rural areas with relatively low student numbers, the workshops of many vocational schools are not used to capacity and providers in close proximity may offer similar types of training equipment to their students. Given the considerable cost of vocational training equipment, greater co-ordination and resource sharing between providers holds a lot of potential to enhance the efficiency of the VET network. Typical challenges impeding such collaboration include the strong sense of ownership many principals have over their training facilities and the fact that VET providers at different levels of education frequently operate under different governance structures, which can make cost sharing arrangements difficult in practice.

Joint procurement is another way for schools to benefit from economies of scale while retaining their institutional independence. Such purchasing agreements can be based on the ad hoc collaboration between individual school leaders or the co-ordination activity of local authorities, as is the case in Estonia, where most local governments have centralised the procurement of school services such as catering, building repairs, and the purchase of heating fuel and other school supplies. In order to guarantee school leaders some

discretion, for example in choosing their schools' meal plans, municipalities have developed a selective procurement model that allows state-run institutions to procure services independently unless joint procurement agreements are made by the central purchasing body. The education ministry also co-ordinates procurement activities related to the physical infrastructure of state schools and supervises major decisions concerning the repair, expansion or disposition of assets belonging to state-owned schools (Santiago et al., 2016, p. 122^[25]).

Regional centres for specialised services and teacher collaboration

Another common resource sharing strategy involves the creation of regional centres that provide multiple schools in their vicinity with specialist services or equipment that could not be efficiently provided at a smaller scale. The regional counselling centres in Estonia provide a good example of this practice, providing specialised services related to the diagnosis and accommodation of SEN students to multiple schools (see Box 3.3). The initiative for the regionalised provision of services can originate at different levels of administration. In Austria, educational psychology and career guidance (*Schulpsychologie-Bildungsberatung*) is provided by 77 school psychological service units across the country, run by the Federal Ministry of Education, Science and Research. They offer psychological information, counselling, support and treatment with the focus of health promotion and personality development, and expert services according to legal provisions (Nusche et al., 2016^[16]). In Denmark, by contrast, the regions are responsible for developing and operating specialised social services including special needs education for children with special needs (Nusche et al., 2016^[72]).

Box 3.3. Centralised provision of specialist services through regional counselling centres in Estonia

As of 1 September 2014, regional counselling centres (“*rajaleidja centres*”, also called “pathfinder centres”) started operating in each Estonian county, providing free counselling services for children and young people under the age of 26. The advice covers areas as diverse as career guidance, special education, psychology, speech therapy and social pedagogy. Municipalities (particularly smaller ones) and schools have the opportunity to request services and specialist support (e.g. of special educators or psychologists) through the regional counselling centres. The counselling centres operate under the umbrella of the Innove Foundation’s Agency for Lifelong Guidance, which develops and provides career guidance and counselling services, trains guidance practitioners, engages in quality assurance for lifelong guidance, and co-operates with stakeholder networks.

Each counselling centre also operates a Counselling Committee entrusted with guiding students with special educational needs and learning difficulties. They provide schools with recommendations concerning the admission of SEN students or the postponement of their school attendance, as well as the organisation of the teaching for students with special educational needs. The counselling services for SEN students further include the provision of speech therapists, special education teachers, social pedagogues and psychologists. In the future, the regional counselling centres may also assume the responsibility for diagnosing special needs.

The regional counselling centres have significant potential for improving the day-to-day operation of schools and effectiveness of the school network. To fulfil their potential, they require sustained support in developing the staff capacity, procedures and practices necessary for them to be attractive service providers for schools and local governments. They can also act as important sources of information for national policy makers about where the system needs to be adjusted to improve educational outcomes and equity. Even though the counselling centres still depend on the financial support of the European Social Fund (ESF), in the long term, they might be financed through the fees paid by schools, households, and teachers to purchase their services.

Source: Santiago, P. et al. (2016), *OECD Reviews of School Resources: Estonia 2016*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264251731-en>, pp. 57, 91, 102.

Teacher resource centres (TRCs) are another example of inter-school collaboration, providing schools with opportunities that they might not otherwise enjoy due to their limited size or isolation. TRCs aim to provide teachers from multiple schools with a shared space to foster peer learning, informal exchange and collaboration for example on the development of materials and curricula. TRCs may also offer more formal in-service training, particularly where such opportunities would not otherwise be available due to the small size of the participating schools' teaching workforce (Giordano, 2008, p. 26^[71]). TRCs can be integrated into an existing school cluster or run independently. In Chile, so-called *microcentros rurales* serve a similar function and have played a key role in alleviating the professional isolation of rural multi-grade teachers (see Box 3.4).

Box 3.4. Rural micro centres as platforms for teacher collaboration in Chile

In Chile, "rural micro-centres" (*microcentros rurales*) provide teachers in rural areas with a space to meet, to collaborate and to share best practices to address their common challenges. In a context in which close to half of all rural schools have fewer than four teachers, opportunities for collaborative work, peer learning and professional development are severely limited. Micro-centres thus constitute an important means to strengthen school quality, improve instruction and raise teacher morale.

Teachers of 2 400 small rural schools have the opportunity to meet once a month in one of 374 micro-centres. The objectives of these meetings, as legally specified, are to improve student learning by helping teachers to: i) assess students progress; ii) work on pedagogical innovations needed to improve student learning; iii) exchange pedagogical experiences; iv) design teaching strategies for students; v) set criteria for improvement plans; and vi) receive technical assistance from the ministry's technical-pedagogical advisory services (*Asesores Técnico-Pedagógicos*, ATP) or independent advisory services (*Asesorías Técnicas Educativas*, ATE).

Since 1992, rural schools have also received technical support through the Basic Rural Education Programme (*Programa de Educación Rural*, PER) whose objective is to improve rural students' learning through adapted pedagogical tools and teaching materials, focussing on the work of micro-centres and targeting rural schools that rely on multi-grade teaching.

Source: Santiago, P. et al. (2017), *OECD Reviews of School Resources: Chile 2017*, OECD Publishing, Paris, pp. 94, 101, <http://dx.doi.org/10.1787/9789264285637-en>.

School clusters under consolidated administration

In some contexts, it has been beneficial for school collaborations to extend beyond resource sharing agreements between independent providers and to include elements of centralised leadership and joint administration. Although the formation of school clusters under a single leadership has often been pursued to streamline school management and improve the quality of educational provision, it has also come to be seen as a path to greater cost effectiveness and, particularly in rural areas, as a means to rationalise the school network while avoiding the closure of small schools.

Different approaches to clustering schools

While the term school cluster has been applied to a range of structures, it is here used to denote the formal co-operation of schools under some form of consolidated administration. Creating such clusters (or federations, as they are sometimes referred to) typically involves designating one school as a lead, core or hub school and converting multiple nearby schools into satellites. In the most far-reaching cases, this effectively entails the closure of two or more schools and a change of leadership structures to create a split-site school under a single principal or governing body and a joint budget. In other cases, a cluster's central administration may assume a leadership role but allow each of the cluster's constituent institutions to operate as relatively independent units that retain a significant degree of autonomy in their day-to-day operations (Ares Abalde, 2014, p. 30 f._[30]). Depending on their degree of integration, some school clusters allow members to maintain and even refine distinct identities and educational profiles while others follow a unitary educational project, which tends to require strong pedagogical leadership.

There is great variety in the processes by which school clusters are formed, the purposes they serve and the extent to which they transform the governance of their constituent institutions. Giordano (2008, p. 88 ff._[71]) offers a typology of different models, distinguishing between bottom-up and top-down, voluntary vs. mandatory, selective vs. universal, single- vs. multi-issue approaches, and between clusters that serve primarily as tools for external control vs. those that emphasise internal development. Some clusters integrate schools with a similar educational offer while others include schools providing different levels of education. Examples of both can be observed in Lithuania (see Chapter 4, Box 4.2), which has promoted the construction of multi-function and regional training centres to bring small rural providers under a unified administrative structure.

Clustering has become one of the most popular approaches to supporting English primary schools within the United Kingdom's relatively autonomous system. In the case of Whitesheet Primary School in Wiltshire (United Kingdom), two village schools with a combined enrolment of only 64 students were turned into a single school with two sites. Shortly after, the school started attracting additional students, growing to 99 in total, which improved its ability to recruit and retain qualified teachers, increased the school's flexibility and efficiency in the allocation of staff and equipped it to withstand future fluctuations in student numbers (OECD, 2010, p. 41_[62]). Since the English rural schools that organise themselves clusters are often less than a thirty minute drive apart, they can organise frequent cluster meetings and exchanges between their staff (Rule, 2005_[74]).

Multi-Academy Trusts (MATs) provide another example of effective school co-operation at the secondary level in the United Kingdom. Joining a trust enables academy governors and school leaders to collaborate, share effective practices and generate economies of scale when purchasing or sharing goods and services. Although a large geographic

distance between schools can diminish the collaborative benefits of MATs and render their governance more difficult, several trusts have effectively combined large urban schools with smaller rural schools in their surroundings. In order to ensure that schools enjoy these benefits regardless of their geographic location, Regional School Commissioners (RSCs) are responsible for that preventing small schools in rural areas are isolated and excluded from joining MATs (UK Department for Education, 2016^[76]).

School clusters in OECD review countries vary in size, typically comprising up to 15 schools in relative geographic proximity. The distance between schools may affect the viability of day-to-day collaboration within the cluster and the extent to which, for example, pedagogical staff can be assigned to teach at multiple schools over the course of a day. Working in school clusters places high demands on the time of school leaders and teachers. Similar difficulties have been observed in Uruguay, where the majority of teachers in secondary education work in more than one school, albeit not due to the clustering of schools (Santiago et al., 2016, p. 231^[46]). Based on the latest Teacher Survey carried out in 2015, 12% of Uruguay's teachers reported to work in at least three schools, with the proportion rising to 17% in both general public secondary and technical-professional schools and to 21% in private secondary schools (Instituto Nacional de Evaluación Educativa (INEEd), 2016^[73]). In the French Community of Belgium, specialised teachers employed by small schools often have to travel between multiple provinces. This can imply excessive travelling times that could often be avoided if proximate schools belonging to different umbrella networks were to collaborate on the joint use of human resources.

Additional challenges when entering a formal collaboration under joint leadership concern the decision where to locate its administrative centre, the selection of a principal, and re-defining the professional profiles of principals in satellite schools. In addition to taking on administrative responsibilities, the central hub of a school cluster may also act as a resource centre for teaching materials or provide facilities like a library or a computer lab to the teachers and students from surrounding schools (Giordano, 2008, pp. 23, 82^[71]). While it can be intuitive to choose the largest, most central or best-equipped school to act as the cluster hub, there is a risk that it may be perceived as superior to its satellite schools and attract a disproportionate share of students from its surrounding units. Some Dutch school federations have resolved this problem by letting the principal rotate between the participating schools (Rule, 2005^[74]).

School clusters also need to engage in the complex task of organising transport arrangements and co-ordinating the schedules of teachers travelling between the central school and its satellites as well as those of students attending courses in multiple schools. Administrations also need to routinely decide on the distribution of resources like teacher working time or newly acquired equipment and whether they will be more efficiently used in the cluster's central school or its satellites. The leadership team also needs to decide which grades should be taught in which satellite schools so as to use the available resources most effectively while bearing in mind the interests of students and teachers (OECD/The World Bank, 2015, p. 122^[75]). In light of these complex tasks, successful clustering initiatives involving a centralised leadership team and budget require careful attention to administrative capacity building and effective mechanisms to involve the school communities in the decision-making processes.

Economic and educational impact of school clustering

In addition to the savings that can be generated by sharing resources and tapping into economies of scale, uniting multiple schools under a single leadership team allows schools to reduce their overhead and expenditure on administrative personnel or back-end IT systems. Particularly in rural areas characterised by a large number of fragmented providers, the consolidation of administrative and pedagogical capacity within a school cluster can offer small schools educational opportunities that they would be unable to finance on their own. Where school clusters integrate more than one level of education, they can also strengthen the articulation and co-ordination of students' vertical transitions (see Chapter 4). This was one of the reasons for school clustering policies that Colombia implemented in 2002 as part of broader decentralisation reforms. By ensuring that each school cluster offered all levels of education, the reform sought to strengthen students' transition across levels of education, particularly in rural areas (Radinger et al., 2018^[77]).

Joining a school cluster can also put small schools in a better position to serve the needs of dispersed student populations with similar educational needs. Clusters can, for example, enable teachers to exchange their experience and pedagogical practices or to collaboratively develop teaching materials and tests for special needs or minority-language students. In the Netherlands, for instance, school clusters were provided with additional resources for special needs education which were used to co-ordinate support for educators to develop methods for students with behavioural problems, learning disorders and physical disabilities (Jan Pijl and Van Den Bos, 2001^[78]). Like other forms of collaboration, clusters can provide teachers in remote areas with opportunities for face-to-face interaction during regular cluster meetings, and thereby reduce professional isolation. Some well-established clusters in Wales have even developed specific teaching materials that take into account their schools' location and size. At the same time, different school sites under a common administration may require principals to develop new strategies to provide adequate pedagogical leadership. Building pedagogical and managerial capacity in cluster leaders could, for example, involve the creation of new teacher leadership roles to effectively observe teachers' classroom practices and provide critical feedback as needed.

School clusters can also function as a means to increase accountability and facilitate education management. They can provide both local stakeholders and central or intermediate administrations with a point of contact that facilitates the transmission of information between them and the school leadership. In some cases, the creation of school clusters has therefore been explicitly pursued as part of decentralisation reforms, assigning them a formal role in the administrative hierarchy and enabling districts to interact with groups of schools rather than individual institutions. Likewise, enhancing administrative capacity at the local level by clustering schools has thus occasionally been seen as a condition for the delegation of resource management responsibilities.

Including mechanisms for stakeholder engagement and accountability from the very beginning of clustering projects can increase their chances of economic and educational success. According to Giordano (2008, p. 118 ff.^[71]), school clusters are most likely to have a positive impact on teaching and learning if they foster local ownership through parent and community involvement and make use of development plans and self-evaluations to set goals and gauge progress. The significant school consolidation that took place in Portugal after 2005 aimed to achieve all of the goals above through a combination of strong central steering, direct support for local governments, and the effective use of school clusters (see Box 3.5) (Liebowitz et al., 2018^[79]).

Box 3.5. Clustering as part of school network consolidation in Portugal

In 2005, Portugal, initiated an ambitious consolidation reform to address the school network's inefficiency and drastic regional inequalities. Within a decade, Portuguese educational authorities closed 47% of the country's public schools, most of them primary schools in rural areas. Prior to the reform, rural areas were dominated by small schools with poor facilities and low performance while schools in urban areas were often overcrowded and relied on double-shift education. To address this problem, the Ministry of Education started co-operating with local governments and school executive boards to close down underperforming schools with fewer than 20 students and above average annual repetition rates in 2005/06. Even though the consolidation efforts were legally mandated, their implementation required the municipalities', school leaders' and parents' consent that the changes would improve the learning experience of affected students. At the same time, the ministry provided participating local authorities with financial support to invest in new school clusters and school transport where the changes to the school network had led to an increase in students' travel distances (Matthews et al., 2009^[80]). Many small schools were also replaced by newly built facilities with a minimum of 150 students, full-day instruction and access to curricular enrichment activities.

As part of the consolidation process, nearly all public schools (98%) were re-organised into clusters comprising schools from one or more education levels under a single administration. Similar to other countries, the organisational leadership of clusters is assigned to a principal (supported by a number of deputy principals and school co-ordinators) and school governing councils composed of representatives (mainly teachers) of each school. School clusters typically group between 4 and 7 schools, but range in size from as few as 2 to as many as 28 schools.

The introduction of clusters aimed to mitigate some of the negative consequences of school closures, allowed for a more rational use of resources and eased students' vertical transitions across levels of compulsory education. Within a single cluster, students can more easily progress through school years and education levels while remaining within their extended school community, allaying concerns typically associated with a change of school environments. Furthermore, since resource planning is conducted at the cluster level, variations in demand for any given school can be more easily dealt with by shifting human and material resources across collectively managed school buildings. The reorganisation of the school network is also considered to have ameliorated the isolation of rural teachers, improved educational opportunities for disadvantaged students in isolated areas, and fostered greater collaboration between the Ministry of Education, municipalities, schools and other stakeholders.

Several features of the reform contributed to the success of the reorganisation: i) the reform was guided by a clear vision and criteria that specified which schools should close and what they would be replaced with; ii) it was recognised that parents needed to be convinced of the reforms' positive outcomes for them and their children and incentives, including free transport, were provided; iii) municipalities supported cluster leaders in assuming their new responsibilities.

Sources: Liebowitz, D., Pablo, G., Hooge, E., & Lima, G. (forthcoming), *OECD Reviews of School Resources: Portugal 2018*, OECD Publishing, Paris; Ares Abalde, M. (2014), "School Size Policies: A Literature Review", *OECD Education Working Papers*, No. 106, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jxt472ddkjl-en>; Matthews, P. et al. (2009), *Policy Measures Implemented in the First Cycle of Compulsory Education in Portugal: International Evaluation for the Ministry of Education*, Office for Education Statistics and Planning, Ministry of Education, Portugal.

School consolidation

The consolidation of the school network conventionally refers to the process of closing one or more schools and transferring their students to surrounding providers, thus reducing the total number of schools in the network and increasing the enrolment of those that remain. Over the past decade, the consolidation of school networks has been a common response to declining student rolls, fiscal pressure or a combination of both. According to a 2013 report by the European Commission (EC), around two thirds of countries or regions in the European Union (EU) engaged in school consolidation between 2010 and 2012. Although these measures mainly concerned primary and secondary schools, eleven European countries or regions also consolidated their stock of pre-primary facilities, including the Czech Republic, Estonia, Iceland, Lithuania and Portugal (European Commission, EACEA and Eurydice, 2013, p. 60 f.^[81]). In other countries, such as the United States, the pace of consolidation has slowed down following a period of wide-spread school closures in 1930-70, which saw the number of schools drop by nearly two thirds, affecting more than 100 000 schools and leading to a five-fold increase in the average school size (Duncombe and Yinger, 2007^[82]).

Fiscal pressure in the wake of financial and economic crises was a significant factor driving recent consolidation in countries such as Denmark, Iceland, Italy, Latvia, Poland, Portugal and Slovakia. In Portugal, the high cost of installing and adequately maintaining essential infrastructure such as canteens, libraries and ICT facilities added to concerns about the weak educational offer and learning conditions in some very small schools. Likewise, the reorganisation of the Danish school network was partly a response to municipal budget cuts. In other systems, consolidation was driven by reforms to the structure of the school system, e.g. in Malta, where the number of schools fell due to the phasing out of its dual secondary education system. In the majority of countries concerned, however, the main rationale for school consolidation was a desire to make infrastructural adjustments in response to demographic developments and changing patterns of demand, often associated with a decline in the rural school-age population (European Commission, EACEA and Eurydice, 2013, p. 60 f.^[81]).

Even though most cities face the opposite challenge (as described further below), demographic decline and concerns about performance have motivated a number of urban school districts in the United States, including Detroit, Milwaukee, Pittsburgh and the District of Colombia, to engage in similar initiatives and significantly consolidate their school networks. As in rural areas, these reforms have sometimes prompted concerns about rising inequality in the access to education and, more specifically, about their effect on student segregation (Lee and Lubienski, 2017^[83]).

Economic and educational impact of school consolidation

Arguments in favour of school consolidation often stress its economic and educational benefits, citing the school network's increased efficiency through economies of scale and expected benefits to student learning by virtue of the resources available to larger schools. Yet, although gains in economic efficiency are a central aim of consolidation projects, recent surveys of the empirical evidence point out that their effect on public expenditure is not frequently subject to rigorous evaluations (Knoth Humlum and Smith, 2015^[33]). Even fewer studies take into account the costs that consolidation may generate for private households, including the time and money spent on longer commuting distances (Ares Abalde, 2014^[30]).

Despite an insufficient culture of empirical evaluation, existing cost and production function studies of school district consolidation suggest that – up to a certain point – increasing the size of schools can allow for a given educational quality to be provided at a significantly lower cost per student (Andrews, Duncombe and Yinger, 2002^[34]). Part of a school's operating and capital expenditure is relatively fixed and therefore higher per student in small schools. This includes the salaries of the school leadership, central administration and school board as well as the cost of buildings, heating systems or science labs. Depending on the structure of the school network, the schools' present size and distance from each other, the prospective savings of consolidations may be outweighed by increased transport costs and the diseconomies of scale that may emerge once schools reach a certain size. Based on evidence from the consolidation of rural school districts in the State of New York between 1985 and 1997, Duncombe and Yinger (2007^[82]) find strong evidence for economies of scale in schools' current expenditure, particularly for instruction and administration, but not in their capital expenditure. In the long-term, they find per-student operating expenditure to decrease by 62% when two 300-student districts merge and by 49.6% when two 1500-student districts merge, which indicates diminishing returns to the consolidation of larger schools or districts.

It is also important to bear in mind that the process of consolidation itself can generate substantial transition costs in the short term. These may accrue from purchasing additional instructional material for newly arrived students; expanding the facilities of receiving institutions; merging information and communication technology (ICT) and software; revising transport schedules or setting up new transport contracts; renegotiating collective bargaining agreements with teachers; and reviewing, correcting or amending existing service contracts (Andrews, Duncombe and Yinger, 2002^[34]). Evidence from district consolidations in the U.S. State of New York suggest a large upward shift in both current and capital expenditure, followed by a gradual decline in the years after the consolidation (Duncombe and Yinger, 2007^[82]). The efficiency gains generated through consolidation are therefore unlikely to materialise immediately and, depending on the cost sharing arrangements, may accrue asymmetrically to the consolidating and the receiving schools.

Besides their expected impact on public expenditure, non-economic factors related to educational quality and student well-being are at the forefront of discussions on school consolidation since the closure of schools can have a significant impact on students' learning experience and daily lives. Consolidation can affect students by increasing the size of their schools and through the disruptive experience of relocating or receiving new students (especially in the short term). By reducing the number of schools in the network, consolidation can also limit students' choice and inter-school competition, although it may also reduce inequities arising from students sorting and residential segregation (Knoth Humlum and Smith, 2015, p. 16^[33]). As for the economic consequences of consolidation, the educational effects arising from the disruptive process of school closures are likely to subside over time, while the changes in school size and the network's structure shape the longer-term effects of consolidation.

Beyond the effects of attending a larger school – including the greater curricular diversity, specialised teachers, but also larger class sizes – most studies find that students forced to relocate following the closure of their schools tend to, on average, experience detrimental short-term effects on performance, retention and school dropout (Beuchert et al., 2016^[84]; Knoth Humlum and Smith, 2015, p. 16^[33]). At the same time, there is evidence to suggest that the relocation has fewer adverse and even positive effects on students' outcomes where the closure affects low-performing schools and students are

relocated to relatively high-performing schools (Brummet, 2014^[85]; Engberg et al., 2012^[86]). An evaluation of school closures in Michigan also found that students suffered more from school closures if they were scattered across multiple recipient sites (Brummet, 2014^[85]). This suggests that the disruption of students' peer networks may be responsible for some of the adverse effects and underlines the importance of paying close attention to ensuring both a smooth transition and successful integration of students from consolidated schools.

Secondary effects of school closures may stem from the reduced number of providers competing in a given area, a diminished scope for parental choice, and changes in students' peer composition. Where consolidation is implemented by merging local school districts, the effects of increased school size can coincide and interact with those of strengthened municipal administrative capacity (OECD, 2017^[27]). Estimates from an early wave of consolidation in the United States during the middle of the 20th century, for example, show that the larger size of consolidated school districts was associated with positive long-term student outcomes while the increase in school size that tended to go along with it had a negative effect (Berry and West, 2008^[87]). Empirically disentangling the various pathways through which consolidation affects students' outcomes is therefore difficult, especially in light of their potential heterogeneity across the student population and their mediation by the idiosyncratic characteristics of each project's local context and implementation (Knoth Humlum and Smith, 2015^[33]).

Any reorganisation of the school network and plans for consolidation should be carefully conducted with a view to identify potential consequences for equity. A frequent concern arising in the context of consolidation, for example, is that the closure of schools could disproportionately affect disadvantaged students, partly since students with a lower socio-economic profile tend not to fare as well in larger schools and classes as their peers (Piketty, 2004^[35]). Likewise, consolidation measures could have a negative impact on students requiring language training or those with special educational needs, unless the provision of relevant services and personnel can be guaranteed throughout the transitional period (Santiago et al., 2016, p. 29^[4]). Whether or not disadvantaged students suffer from school closures is likely to depend on the local context. Even though Brummet (2014^[85]) finds that displaced students suffer from school consolidation on average, students from relatively low-performing schools are found to benefit from consolidation if it implies their relocation to high-performing schools. This suggests that the consolidation of adjacent schools with different socio-economic and academic profiles might diminish segregation and inequality.

Specific measures that countries have taken to protect students during the restructuring processes include the active involvement and consultation of representatives of vulnerable student groups. Some services targeted at disadvantaged students or minorities, such as the work of teaching assistants, could also receive special protection when restructuring measures are implemented. Other equity-promoting measures that should accompany restructuring or consolidation measures include professional development that enables teachers to provide personalised instruction in what might be more heterogeneous consolidated schools (Santiago et al., 2016, p. 29^[4]).

To ensure that plans for school consolidation and the surrounding deliberations are informed by best practice, it is prudent to collect relevant data and equip stakeholders with the capacity to interpret and effectively employ it. In many countries, evidence concerning the effects of consolidation on student learning outcomes, their well-being and the wider community remains scarce (Commission on the Delivery of Rural

Education, 2013^[88]) and many systems lack a culture of evaluating policy interventions related to the reorganisation of the school network. While the experience from comparable projects in other education systems and international best practices can provide important lessons, sharing evaluation results among national stakeholders at the sub-system level remains a crucial part of promoting system-wide learning. This requires the careful monitoring of ongoing network reforms and their subsequent evaluation as well as the use of this information to make adjustments to current consolidation processes and inform future reforms elsewhere.

Regardless of the efficiency gains that might be achieved by restructuring the school network, it is important to keep in mind that school consolidation should be guided by the goal to ensure the highest quality of education for the greatest number of children. This may involve difficult trade-offs and authorities should balance the importance of efficiency with the values of both equity and quality. In light of the evidence, it is clear that there are limits to consolidation and that its feasibility and returns depend not only on the present structure of the school network, but also its geographic and social context. Diminishing returns to scale and the excessive impact that school closures in remote areas may have on students' travel time impose a natural limit to consolidation. Research from the United States, which saw a considerable rationalisation of school districts over the course of the 20th century, for example, indicates that parts of its network may have reached or exceeded the point at which further consolidation no longer promises fiscal or educational improvements (Howley, Johnson and Petrie, 2011^[89]). Approaches that are not attuned to local contexts, such as a generalised minimum school size, are therefore unlikely to yield positive outcomes for the reorganisation of rural school networks. Nevertheless, there are many cases in which the consolidation of educational provision would not only generate savings, but also broaden both students' and teachers' opportunities (Santiago et al., 2016, p. 95^[25]).

Policy levers to advance school consolidation

Countries, regions and municipalities have sought to advance school consolidation using a range of policy levers combining financial incentives for the closure of small schools, disincentives for their continued operation, or direct support in the consolidation process. The provision of financial incentives for school co-operation or consolidation through central funding formulas is a powerful steering tool in the governance of school networks. Tying the funding of schools or local governments to the number of enrolled students, for example, discourages the maintenance of small schools due to their relatively high per-student fixed costs. In addition, some systems have used more targeted incentives to consolidate specific parts of the school network. In line with the aim to consolidate lower secondary education, for example, Estonian municipalities that cease their educational provision in Years 7-9 continue to receive salary grants for the students they lose for multiple years while the receiving municipality receives whichever salary coefficient was applied to them prior to the consolidation (Santiago et al., 2016, p. 129 f.^[25]).

Particularly in systems with decentralised funding responsibilities and a high degree of local autonomy, governments have offered direct financial aid to consolidating districts or schools in order to promote consolidation and convince local stakeholders of its benefits. Direct aid of this sort may be needed for providers to cover the significant transition costs that can arise in the course of the consolidation process, including capital investments to expand facilities, the cost of setting up transport systems and increased operating costs that tend to accrue in the years immediately following the closure of schools and reassignment of its students (Andrews, Duncombe and Yinger, 2002^[34]). This direct

financial support can be provided as a one off payment or over multiple years, and take the form of a lump sum grant or earmarked transfer.

In New York State, for example, districts that consolidate their school network receive an increase in their basic operating funding of up to 40% for five years and a declining sum for another nine years. In addition, they may receive a 30% increase in their capital funding for projects initiated within 10 years of the consolidation. Likewise, the Estonian government sought to accelerate the consolidation of its school network by providing special investment grants to local authorities reducing or eliminating their upper secondary provision. At the same time, the government agreed to allocate funding for the transport of students attending one of the new state-run gymnasiums outside of their local municipality as well as offering dormitories or financial support for housing to commuting students (Santiago et al., 2016, p. 130_[25]).

An important challenge related to direct aid programmes is to ensure that consolidating districts spend their additional funding efficiently and with the best interests of their students in mind. In the case of New York State, which provides generous aid to support consolidating districts, a study identified large increases in capital expenditure following school closures (Duncombe and Yinger, 2007_[82]). While some infrastructural adjustments and capital investments may be justified by the need to repurpose facilities and expand receiving schools, authorities should be careful to monitor schools' expenditure and ensure that direct aid following consolidations is spent effectively to support educational quality.

In some countries, the rationalisation of the school networks has not been accelerated by a net change in the funding received by any individual school, but rather by adjusting its distribution mechanism. Notably, in Sweden, the decentralisation of school funding in the form of block grants from the central to the local level between 1986 and 1992 provided fiscally strained municipalities with an opportunity to reduce spending by adjusting their school networks. The decentralisation was therefore followed by a dramatic consolidation of rural schools without any explicit adjustments in national policies related to small schools (Ares Abalde, 2014_[30]).

In systems facing particularly strong pressures to consolidate their school networks, authorities might also consider tying financial support to centrally defined benchmarks for school or class sizes. In the case of the Slovak Republic, for example, the OECD review team explored the option of defining an average minimum class size below which a school is not funded from the state budget if it remains below the threshold for a given number of years. Alternatively, authorities could reduce existing weights for the funding of schools as they drop below a certain threshold (Santiago et al., 2016, p. 14_[4]). As discussed in Chapter 2, however, imposing strict rules on minimum class or school sizes ignores the importance of local context for the efficient organisation of the school network and the feasibility of consolidation.

Finding the right balance of incentives and direct aid to encourage the rational organisation of the school network while striving to improve the educational quality in rural areas wherever possible constitutes a significant challenge for policy makers. In many cases, financial incentives and other policy levers designed to encourage the closure of small schools exist side by side with instruments providing financial support for their continued operation (Duncombe and Yinger, 2007_[82]). There is a risk that opposing financial incentives might cancel each other out or at least send ambiguous signals to local authorities and school leaders, which highlights the importance for policy makers to provide clear guidance and use their steering capacity effectively.

Some of the strategies to resolve this tension have been to exempt small schools for which consolidation is not an option from financial penalties or other instruments designed to exert pressures on inefficient school networks. In Scotland, for example, schools can be excluded from policies meant to encourage consolidation if the Scottish Borders Council identifies them as strategically important and meriting particular protection due to their geographic isolation (Commission on the Delivery of Rural Education, 2013^[88]). These forms of conditionality require authorities to define a set of factors that justify the continued operation of small schools, to systematically and transparently measure them and apply them in their funding mechanisms.

Consultation and stakeholder engagement

Many OECD countries have adopted systematic approaches to stakeholder engagement, involving information, consultation or participation and consider them integral for the successful design and implementation of public policies across a wide range of domains (OECD/Korea Development Institute, 2017^[90]). Public engagement has an intrinsic value, fostering accountability, building civic capacity and trust, and widening the scope for societal actors to make and shape decisions on public goods. In addition, engagement has instrumental value, enhancing the quality of policies by leveraging ideas and resources, aligning them more closely with the needs of the affected constituencies and facilitating their implementation by resolving potential conflicts and generating public support.

Consultation and stakeholder engagement are equally important in the field of education (Viennet and Pont, 2017^[91]) and particularly so when it comes to consolidation, given the significant impact that school closures can have on local communities and the tensions they frequently generate between the actors involved. A lack of communication, engagement and trust among local authorities and stakeholders can aggravate resistance to proposed school network reforms. It is therefore instrumental to communicate a policy's objectives transparently and to engage a broad range of stakeholders, including less active and powerful voices, in the decision-making process (Burns and Köster, 2016^[92]). Ensuring that consolidation procedures are responsive to local economic, ecological and social concerns can pre-empt resistance and generate the support necessary to ease their implementation. Public consultation procedures can also serve an important accountability function, since they require authorities to demonstrate that restructuring measures are driven by a clear vision of quality education, that they have considered alternative options and taken into account its effects on the local community (Ares Abalde, 2014, p. 22^[30]).

In addition to the consultation of relevant authorities as part of formal co-decision procedures, the closure of schools frequently involves the consultation and engagement of local stakeholders. In systems where adjustments to the school network require the formal consent of all affected stakeholders, public consultations and engagement have traditionally played an important role, for example in US states where the consolidation of school districts requires the explicit consent of voters (Duncombe and Yinger, 2007^[82]). Yet, even in systems that do not vest formal decision making power in local stakeholders, articulating a positive educational vision for network reforms can be an important condition for their success. This is particularly true where public schools are competing with private providers and parents might transfer their children to the private sector if the consolidation is not expected to go hand in hand with tangible improvements to the quality of public schools (Nusche et al., 2016, p. 96^[72]).

Although well-structured and executed consultation procedures promise to yield results that are more aligned with local needs and enjoy greater support among the local community, authorities need to be aware that the engagement of stakeholders can be resource intensive, render decision-making processes more complex and require additional time to be factored in. Alemanno (2015^[93]) identifies common obstacles to the effective participation and engagement of the public in decision-making processes:

- **Lack of awareness.** Many OECD governments have embraced the internet and mass communication to provide the public with relevant information regarding legislative decision making and ongoing policy initiatives. This often involves establishing a central point of access providing official information to the relevant stakeholders, sometimes supplemented with press releases, conferences and other public statements. Yet, these efforts may not be sufficient to reach all individuals that have a stake in the process and press pronouncements cannot be relied upon to provide sufficient context for policy proposals and to explain opportunities for engagement.
- **Low participation literacy.** Providing information about ongoing policy initiatives and the opportunities to get involved may not be sufficient to render the process fully inclusive. Few members of the public have a thorough understanding of the way public decision-making processes are organised – a knowledge gap referred to as “low participation literacy”. Even where information about policy initiatives is widely spread, it can fail to trigger engagement if people do not recognise that policy makers are looking for their participation in an ongoing process. Other barriers related to language, resources or special needs should also be taken into account.
- **Information overload and capture.** The documents announcing public initiatives and describing their predicted impact tend to be lengthy, technically complex and difficult for non-expert audiences to understand. This reduces participation and creates the potential for “information capture” by stakeholders who can leverage the high cost of information acquisition to gain control over the decision-making process at the exclusion of others.
- **Disillusionment due to past record.** Negative experiences with consultation and engagement processes can lead to lasting disillusionment and scepticism among stakeholders. The public willingness to engage in consultations can be severely reduced if they appear to serve cosmetic purposes or merely legitimise decisions that have already been taken. Authorities should also be careful to prevent third parties from capturing engagement procedures to advance their interests and other factors that could undermine public trust, such as attempts at manipulative framing.

Public directives can significantly influence the terms on which stakeholder engagement is conducted. Consultation processes can be mandatory or merely recommended, can take place at different points during the network reform process and can be vested with varying degrees of influence over its outcomes. Some school systems, like those of Quebec or England, require any school closure to be preceded by a consultation process that brings together all major stakeholders in order to resolve conflicts before they arise and to hold authorities to account. In Scotland, the consultation process leading up to any proposed school consolidation is explicitly designed to establish a “presumption against school closure” and requires local authorities to make their case exclusively on educational grounds, as described in Box 3.6 (Ares Abalde, 2014, p. 22^[30]; Commission on the Delivery of Rural Education, 2013^[88]). Designing consultation procedures that set

a very high bar for consolidation places stakeholders in a strong position to defend the local provision of education. At the same time, it can exert significant financial pressure on regions in demographic decline and prevent them from adequately balancing educational, social and economic concerns (Slee and Miller, 2015^[94]). Clear guidance on when and how to conduct consultations and which information stakeholders should be provided with can be an effective means to support local authorities and align expectations among all actors involved.

Box 3.6. Consultation procedure for school closures in Scotland

In 2010, the Scottish Schools Act introduced a new consultation procedure, which local councils must initiate before closing, merging, relocating or opening a school. The process was intended to bring together all stakeholders affected by the school restructuring, including students of the affected school and their parents, teachers, staff, or trade unions, parents of children who might attend the school within two years of the proposed date of closure and relevant church or denominational bodies, where appropriate. One of the aims of the consultation process was to establish a “presumption against closure” and to ensure that educational benefits would be the driving force in any proposed closure.

Local authorities were therefore required to publish an Educational Benefit Statement presenting the proposal’s likely impact on students and other users of the school facilities. During the consultation process, they are asked to clarify which policy alternatives were available and why a particular option was chosen, taking into consideration both short and long-term effects. In some cases, the process was supported by studies prepared by external consultants that assessed the likely socio-economic impact of a school closure. Over the course of the consultation process, initial proposals were often altered to reflect ideas and concerns generated during public debates. In other cases, they were deferred, shelved or replaced by new proposals.

Between 2011 and 2013, the Scottish Government tasked the independent Commission on the Delivery of Rural Education with conducting a review of the consultation procedure and providing recommendations to improve its effectiveness. Recurring conflicts between local communities and councils had been a cause of concern, as had the quality of the reviews and evidence base upon which local authorities could mount their case for restructuring plans. While underlining the importance of the Education Benefits Statement, the Commission also criticised that it created the unrealistic expectation that educational considerations would be the sole criterion driving network reforms. Instead, the Commission suggested that it should be acceptable for councils to demonstrate that the children would not be detrimentally affected and to include transparent and accurate financial information to be considered alongside it. In 2014, the Children and Young People (Scotland) Act, introduced some changes to the process, including the requirement for school closure proposals to contain information on its financial implications. In addition, the often-mentioned “presumption against closure” was explicitly included and clarified in the Act to reduce disputes over the interpretation of “viable alternative to the closure proposal” that would need to be considered.

Sources: Ares Abalde, M. (2014), “School Size Policies: A Literature Review”, *OECD Education Working Papers*, No. 106, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jxt472ddkjl-en>; Commission on the Delivery of Rural Education (CDRE) (2013), *Commission on the Delivery of Rural Education: Report*, Edinburgh; The Scottish Government (2008), *Safeguarding our rural schools and improving school consultation procedures. Proposals for changes to legislation*, Edinburgh; Slee, B., & Miller, D. (2015), *School Closures as a Driver of Rural Decline in Scotland: A Problem in Pursuit of Some Evidence?*, *Scottish Geographical Journal*, 131(2), 78–97, <https://doi.org/10.1080/14702541.2014.988288>.

Administrative process of school closure and student relocation

The consolidation of school networks involves complex administrative procedures and often rely on the co-operation of multiple levels of government, agencies and stakeholders in the time leading up to and following the closure of schools. As described in Chapter 2, the authorities involved in the process vary across systems depending on their distribution of responsibilities for the school network and on the way in which the closure was brought about, i.e. whether it was voluntary or enforced, hierarchical or horizontal.

The administrative process of school closures may be initiated by the school founders themselves or a request submitted to the responsible authority by another entity. In the Slovak Republic, for example, the central ministry has the authority to decide on the closure of schools on the basis of requests that may be submitted by the school founder, regional state authority or the state's school inspectorate and which need to provide reasons for closure, such as deficiencies in personnel, material or equipment (Educational Policy Institute, 2015, p. 53^[95]). In Estonia, decisions on the closure of schools are taken by their owner, which may be a municipality, the ministry or a private entity. They take into consideration a number of aspects, including the quality of education, the cost of provision, safety and health conditions, school alternatives in the vicinity, the quality of roads around school location and the school's role in the local community and cultural life (Santiago et al., 2016, p. 73^[25]).

The administrative procedures leading up to school closures can be highly complex, particularly where they involve negotiations between multiple authorities. In Austria, for example, they are often preceded by intense political dialogue between stakeholders and negotiations between the provincial government and the federal level represented by the provincial school board. In order to gain the consent of municipalities, agreements over consolidation procedures often require the provision of financial incentives and the failure to reach a consensus may lead to administrative court proceedings causing some school closures to stretch over several years (Rechnungshof, 2014^[96]).

Wherever a school is closed, providing an adequate alternative for its students and minimising the disruption caused by the relocation process is the highest priority for parents and local authorities alike. Finding a proximate school with a matching educational offer to absorb students from consolidated institutions is crucial to ensure that they can continue to attend schools at a reasonable distance from their homes and continue following their educational pathways. The responsibility for choosing among potential recipient schools may lie with parents or local administrations, depending on the systems' degree of school choice. In either case, challenges may arise if the surrounding schools have limited capacity or they cannot provide the educational offer students previously received.

In the event of a school closure, authorities also need to arrange the redistribution of resources previously dedicated to the closed school and decide who should bear the transition costs associated with student transport, teachers' severance pay and infrastructural conversions. While a share of the closed schools' funding usually follows students and teachers to their new providers, systems vary in the extent to which they financially reward municipalities for consolidating their school network rather than letting them bear part of its costs. In Austria, for example, municipalities that close their schools are obliged to compensate the constituency which absorbs their students to cover part of its increased infrastructure and non-teaching staff expenditures which may discourage them from consolidating their networks (Nusche et al., 2016, p. 124^[16]). In

Lithuania, by contrast, consolidating districts' maintenance funds are distributed among the remaining schools based on their needs for renovation; or used for the maintenance of whichever public institution may take the consolidated school's place (e.g. multi-functional centres providing informal child education, cultural, social or other community services) (NASE (National Agency for School Evaluation), 2015^[97]).

The future use of vacated school facilities is another important aspect when planning consolidation procedures. While the continued maintenance of buildings can constitute a burden for financially strained rural communities, freeing up capacity in previously under-utilised facilities and putting them to new uses can also provide significant opportunities (Nusche et al., 2016, p. 124^[16]). This can involve the buildings' continued public use for the provision of different community or social services. Where there is no demand for such facilities, leasing or selling them can be an attractive option, potentially after remodelling them for residential or commercial use. Since mismatches in demand and supply are often unevenly distributed across different levels and types of school provision, repurposing facilities for other educational services is a good example of modular approaches to the school network. In the Czech Republic, for instance, the OECD review team recommended using the capacity generated by consolidating the lower secondary network to respond to the risen demand for pre-school places (Shewbridge et al., 2016, p. 84^[66]). Plans for future use of school buildings should be clearly stated and discussed at an early stage of the consolidation process to allow for input from stakeholders. Since repurposing school buildings can imply complex legal procedures, local authorities may need support to assess different options at their disposal and avoid legal costs or delays (Commission on the Delivery of Rural Education, 2013^[88]).

Arrangements for school transport

Both public and private expenditure on students' transport tend to be higher in rural than in urban communities, given the longer average distances between their homes and schools or afternoon activities (Reeves, 2003^[98]; Showalter et al., 2017^[19]). Concerns about a further rise of private transport costs and commuting times are frequently cited as one of the most problematic aspects of school consolidation and a reason for many communities' resistance (Killeen and Sipple, 2000^[99]). At the same time, the rising costs of school transport services in countries like the United States have driven many local authorities to reduce their provision. According to the National Center for Education Statistics (U.S. Department of Education, 2016^[100]), the average per-student expenditure on public bus transport was USD 961 in 2011–2012; compared to only USD 531 in 1980–1981 (adjusted for inflation). Many school districts have therefore halted school transport services altogether, reduced the number of routes and bus stops or increased the minimum distance for students' eligibility (Gottfried, 2017^[101]).

Particularly for the parents of young students, school transport can be critical to alleviate concerns over work schedule conflicts and the safety of students who would otherwise rely on walking, cycling, or taking public transit to school. Longer travelling times have also been suggested to negatively impact students by causing fatigue or inattentiveness in class and reducing students' time for extracurricular activities or the interaction with their families (Gottfried, 2017^[101]).

The absence of convenient transport options may also increase students' risk of dropping out, especially for disadvantaged students and those expecting lower returns from education. While evidence concerning the impact of geographical constraints on upper

secondary participation and completion is limited, a study in Norway found longer travel times to have a modest negative effect on the probability of graduation, particularly for students whose prior achievement suggests that they are at the margin of dropping out (Falch, Lujala and Strøm, 2013^[102]). Evidence from the United States confirms that the use of school buses is associated with reduced absenteeism among kindergarten students (Gottfried, 2017^[101]). Likewise, in the United Kingdom, marginal students with middling achievement or from disadvantaged backgrounds were less likely to engage in post-compulsory academic education the longer they would have to commute to the nearest academic institution (Dickerson and McIntosh, 2013^[103]).

When planning the closure of schools, education authorities therefore need to ensure that students will be provided with adequate arrangements for transport and take into account its direct cost on communities as well as the burden it may place on students, parents and staff. Nevertheless, the effects of increased travel times and the cost of transport services are often overlooked, both in the academic literature and in the assessments of consolidation plans (Ares Abalde, 2014^[30]). Guaranteeing that consolidation plans are accompanied by provisions for school transport and that their costs are adequately accounted for is particularly challenging in systems where the responsibilities for public transport and the organisation of the school network are split between different authorities. Since the costs and savings of school closures may asymmetrically accrue to different levels of administration, it is important to ensure that the incentives for and against consolidation are aligned to promote aggregate resource efficiency and the best interests of students.

Several education systems are supporting school transport, either through their main funding mechanisms or through special-purpose funds targeting individual students and families. The legal frameworks specifying who is responsible for organising and financing school transport and who is eligible to benefit from it vary considerably across the countries that took part in the OECD review's qualitative survey on school funding. While many systems provide free transport services for students with specific characteristics or living in a specific area, others combine it with universal discounts on the price of public transport. In Chile, for example, all students attending Years 5 to 12 in a municipal or subsidised private school are eligible for reduced public transport fares and those attending municipal schools in remote areas benefit from free transport services by the central government from the pre-primary to the secondary level (Ministry of Education Agency for Quality Education and Education Superintendence, 2016^[104]).

The success of consolidation initiatives critically depends on ensuring students' continued access to education and the use of transparent, adequate criteria to determine their eligibility for transport support. 10 of the 14 school systems with available information reported to use distance-based criteria to determine which students should benefit from school transport. In four of those cases, legal frameworks specified a distance between student's homes and their school above which such support would be provided. In Lithuania, for example, the ministry has committed to guarantee safe transport for every child living in a village that is further than 3 km from the nearest school, as well as every child with special educational needs, who has difficulties getting to school. Between 2000 and 2014, the country has therefore made significant investments to purchase a fleet of almost 700 municipal school buses. With support from EU Structural Funds, this investment has greatly eased students' transitions to new schools during the consolidation of the school network and improved young people's access to extracurricular activities (Shewbridge et al., 2016, p. 61^[105]). Similarly, in Sweden, municipalities are responsible

for covering the costs of transport for upper secondary students who are enrolled in schools further than 6 km from their place of residence (see Annex Table 3.A.1).

When determining students' eligibility for public transport, countries may take into account additional factors besides their distance to the nearest school, such as their age or safety concerns. In Slovenia, municipalities are obliged to organise safe transport for students in areas where they might be subject to attacks from brown bears and other wild animals, using funding from the central government (Slovenian Ministry of Education Science and Sport, 2016, p. 78_[106]). Danish municipalities cover students' transport cost on a sliding scale based on their age, acknowledging that older children can travel certain distances independently. Specifically, municipalities are obliged to cover transport costs for students living more than 2.5 km away from their *Folkeskole* in pre-school and Years 1-3. For Years 4-6 it is 6 km, for Years 7-9 it is 7 km, and for Year 10 it is a distance of more than 9 km (Nusche et al., 2016, p. 75_[72]). Especially in systems with extensive school choice, the provision of free transport may also be restricted to students taking advantage of local schools or those of a certain provider. In Denmark, for example, parents who choose to enrol their children in private schools are not eligible for free transport (Nusche et al., 2016, p. 75_[72]) and in Austria, transport funding for students who choose to attend schools far from their place of residence is means-tested and conditional on academic success (see Annex Table 3.A.1).

Ensuring the availability of transport options for vulnerable students and those with restricted mobility is of particular importance and seven of the fifteen OECD review countries with available information acknowledge this with dedicated arrangements for students with special educational need. In Estonia, SEN students who require assistance and need to attend schools in a different municipality have a right to adequate transport arrangements or to be compensated for private expenses by their home municipality (Ministry of Education and Research, 2015_[107]). In the Flemish Community of Belgium, all children attending special needs education have the right to bus transport organised and funded by the Community (Flemish Ministry of Education and Training, 2015_[70]). In Spain, the central government provides targeted funding for families, covering up to 50% of the transport costs of students with severe motor disabilities (INEE, 2016, p. 97_[108]).

Even though the excessive use of targeted funding programmes based on different characteristics can create a significant administrative burden (OECD, 2017_[27]), providing clear criteria for the funding of school transport is an effective means to support students in remote areas and ameliorate the negative impacts of school consolidation. The selection and operationalisation of these eligibility criteria merits careful attention to avoid perverse incentives, inequities or the misallocation of funds. In the Slovak Republic, for example, parents are only reimbursed for transport costs if their children's school is located outside their home municipality. In practice, however, schools in neighbouring municipalities can be considerably closer to students' homes than the nearest school within their own municipality (Santiago et al., 2016, p. 140_[4]).

The governance of school transport and the distribution of responsibilities for its funding and management are a critical factor to ensure its seamless provision. In countries like Denmark, Iceland and Kazakhstan, local authorities are responsible for both financing and organising children's transport to schools (Annex Table 3.A.1). This decentralised approach can have several advantages, particularly where local authorities are also responsible for managing their school networks. Combining the responsibility for school closures with that for the provision of student transport enables the responsible authority

to oversee the entire process of consolidation and take its financial merits and drawbacks into account in their entirety. Assigning the funding responsibility for student transport to whichever authority is in charge of consolidation can also increase their accountability and sensitivity to the affected students' needs. Yet, the ability of local authorities to effectively provide remedial transport services depends on their capacity and the size of their school network. Particularly where local authorities are responsible for only one or very few schools, the prospect of covering transport costs for its students when they are absorbed by neighbouring municipalities may significantly reduce their incentives to engage in further consolidation, even where it is otherwise financially prudent and in the students' best educational interest. In other education systems, responsibilities for the funding and organisation of student transport are retained at the central or regional level. In the French Community of Belgium, for example, student transport is managed and funded by the regions (Wallonia and Brussels), although provincial governments can provide affected students with additional funding (International Relations Directorate of the Federation Wallonia-Brussels, 2016^[109]). In education systems like Chile, the Flemish Community of Belgium or Lithuania, the central (or state) government is at least partially responsible for both funding and managing student transport in isolated and rural areas (Annex Table 3.A.1).

The absence of legal frameworks that assign clear responsibilities for the provision of school transport can make it difficult for authorities to assess the feasibility of future consolidation plans and anticipate problems that may arise from increasing distances to schools. Without transport-related legal provisions and efforts to systematically collect and analyse corresponding data, problems arising from consolidation risk to remain hidden from local and national authorities' view (Shewbridge et al., 2016, p. 113 f.^[66]). Likewise, the absence of financial support for student transport places a burden on families in rural areas who lack the time or resources to drive their young children to school. In the Czech Republic, for example, regions are responsible for ensuring that transport to compulsory schools is offered for students living further than 4 km away, but families are expected to contribute to these services, even where public transport is not available. Especially in a context of shrinking student populations in rural areas and efforts to consolidate the school network, this may place an additional burden on parents affected by closures and increased commuting distances.

Setting up a system for student transport and providing targeted support can play an important role in preparing the ground for future network consolidation by incentivising rural students' voluntary transfer to urban schools or responding to parents' concerns about potential school network reforms. In an effort to consolidate its upper secondary school network, for example, the Estonian government encouraged students to attend newly constructed, state-run gymnasias by providing commuting students with financial support for transport and accommodation expenses (Santiago et al., 2016, p. 19^[25]).

Given the significant cost associated with the provision of transport, requiring schools to offer bussing services to their students can create a high barrier to entry for new providers, particularly those intending to serve students in areas with long average commuting distances. Yet, absolving certain providers from the responsibility to provide school transport can have unintended consequences that need to be carefully considered before loosening regulations. In the United States, for example, court decisions in many states and school districts granted charter schools and private providers exceptions from the responsibility to provide their students with transport services. Given that many charter schools serve disadvantaged families in high-needs areas, this has raised serious

concerns about a potential rise in absenteeism, dropouts and ultimately widening social and regional disparities (Gottfried, 2017_[101]).

In some countries, such as Australia, boarding facilities are used to complement rural school networks at the upper secondary level in cases where students' distance to the nearest school is too far for a daily commute (Martin et al., 2014_[110]). Despite the significant variation in boarding schools' missions and students' motivations for attending them, the educational experience of boarders differs markedly from students living at home. Boarding students spend considerably more time in the school environment and among school staff, they have different opportunities for growth and development, and often follow highly regulated daily routines. While boarding may remove some students from a supportive home and family, it provides a more stable environment for others.

A large-scale study from Australia found boarding to have little discernible effects on students' motivation, engagement, and psychological well-being (Martin et al., 2014_[110]). By contrast, quasi-experimental evidence from one of France's 45 "boarding schools of excellence" (*internats d'excellence*), which provided disadvantaged students with high-quality learning environments, points to disruptive effects during the first two years of boarding school attendance and suggests that mostly high-ability students benefited from the boarding environment in the long run (Behaghel, de Chaisemartin and Gurgand, 2017_[111]). Empirical research on boarding schools specifically addressing the needs of rural and remote areas is scarce, but considering some students' reliance on their services to access secondary schools, it is important to establish standards and guidelines ensuring the quality of their provision, including pastoral and academic care, facilities and resources, the provision of extracurricular activities, staff training and qualifications, and boarding students' rights and responsibilities.

Concerns for local development

School closures may have short- and longer-term ramifications for the local community and neighbouring areas that need to be considered. One of the reasons why consolidation is frequently met with local resistance is the detrimental effect it is believed to have, not only on the affected students, but also on the surrounding neighbourhood and community. It has been hypothesised to accelerate the out-migration of young families and the associated loss of economically active adults, hit the local economy, lower housing values and deprive the community of a social hub that may be constitutive of its identity and civic life. The savings stemming from school consolidation could thereby be outweighed by reduced economic activity, lower tax revenue and declining property values (Lyson, 2002_[112]). The likelihood for any of these negative effects to materialise depends on the characteristics of the consolidating communities and the status of the school within it.

Particularly in rural areas, the role of schools for the local community often extends beyond the field of education. In a recent review of the literature, Areas Abalde (2014) identifies three types of such positive externalities: effects on social capital, effects through the provision of community services and effects on the local economy. Rural schools often provide a space for interactions that foster social capital and cohesion if the village community is actively involved in the school's activities. Forging bonds and fostering exchange among residents can lead to increased co-operation for the mutual benefit of community members. In addition, schools may benefit their local community directly by providing additional social services in their facilities. These can be related to education (e.g. day care services or study centres for young people and adults) or address

other community needs, for example by serving as polling stations, information centres for municipal services, spaces for local cultural activities or work places for very small businesses. In addition, schools can be an important source of local employment and provide skilled labour to local businesses (Ares Abalde, 2014^[30]).

In retrospective case studies of 30 Danish school closures between 1990 and 1999, Egelund and Laustsen (2006^[20]) found little evidence of the negative consequences that many communities had expected. In most cases, the closure of schools with an average of 6.6 students appeared to be symptomatic of the rural communities' decline, rather than its cause. While schools undoubtedly serve important non-educational functions in many communities, the viability of providing high-quality education in depopulated rural areas needs to be considered within the wider context of regional economic development and efforts to enhance the conditions of local communities. While it may be possible to maintain the educational provision in areas with very low student numbers, it should be acknowledged that sustaining communities in the process of economic and demographic decline is neither the responsibility, nor within the power of local schools alone.

Decisions on the future of individual small, rural schools should be primarily based on what is in the best interest of their students, rather than their exogenous value for local and regional development. Authorities therefore need to think of alternative ways to sustain the social benefits that schools provide where consolidation is seen as pedagogically prudent or economically unavoidable. This can involve supporting local institutions in taking over the schools' function as a social hub, but needs to be embedded in a broader reflection on economic strategies and funding solutions to support rural development beyond the field of education.

3.4. Addressing efficiency, quality and equity challenges in remote rural schools

As discussed above, the problems associated with small school size are, in many rural and remote areas, compounded by the schools' geographic isolation and inadequate learning infrastructures. Especially in remote areas, the scope for strategies to rationalise the school network by means of fostering school co-operation, clusters or consolidation is limited due to the great distance between sites. In order to ensure that students in these areas enjoy a high-quality education nevertheless, systems can employ a range of strategies to address the challenges of remote schools while leaving the structure of the school network intact.

Since it is widely recognised that the provision of high-quality education in rural areas comes at a higher per-student cost, some countries provide dedicated funding to compensate for the greater resource needs of small, isolated schools and their difficulty to recruit high-quality teachers. In addition, targeted programmes have been used to finance teacher learning and collaboration across isolated schools and improve transport arrangements where distance constitutes a significant barrier for attendance. Denmark, for example, recently increased its financial support for small island schools in order to secure the provision of a high-quality basic school offer in remote areas. Chile also dedicates additional resources for rural and remote schools to address their challenges related to inadequate infrastructure and access, as described in Box 3.7.

Box 3.7. Technical and financial support for rural and remote schools in Chile

The school funding system of Chile includes various supplementary grants to address the needs of schools in rural and remote areas, for example through programmes that promote school enrolment and attendance. Scholarships (*Becas de integración territorial*) are offered to students finishing their basic education so they can continue into upper secondary education and housing and transport programmes support students in remote areas. Chile has also put in place some steps to improve the quality of education in rural and remote areas by improving teachers' working conditions and opportunities for collaboration. There is a monetary incentive to attract teachers and school leaders to remote areas through the "difficult conditions of work allowance" (*Asignación por desempeño en condiciones difíciles*) and teachers taking on the management of a rural school are compensated with a special allowance (*Bonificación especial de profesores encargados de escuelas rurales*). In addition, the "Rural Connections" (*Enlaces Rural*) programme was introduced in 2000 to provide rural schools with technological infrastructure including internet access as well as teaching materials adapted for multi-grade settings.

Source: Santiago, P. et al. (2017), *OECD Reviews of School Resources: Chile 2017*, OECD Publishing, Paris, pp. 94, 101, <http://dx.doi.org/10.1787/9789264285637-en>.

ICT can support the provision of education in rural areas

Besides long-term rural development strategies and targeted financial support, many communities have turned to ICT as an opportunity to overcome some of the disadvantages associated with their small size and geographic isolation (OECD, 2013, p. 26^[113]). Distance education in the form of correspondence courses, videoconferencing, educational television and audio has a long tradition. These and other forms of ICT-supported distance learning are widely employed to promote access to instruction at all levels of education in OECD countries with significant rural populations, including the United States (Hannum et al., 2009^[114]), Canada and Australia (Barbour, 2011^[115]). Adapted to local needs, different levels of education as well as the availability of technological resources and qualified staff, distance learning can connect teachers and students in one-way or two-way interactions based on real-time or asynchronous communication. The use of ICT has ranged from fully-remote distance learning to web-based lessons in the presence of teachers facilitating the process.

Despite the prevalence of distance education, relatively little is known about its cost-effectiveness in general and in rural schools in particular. Meta-analyses comparing distance education with traditional classroom instruction yielded no overall differences but a high degree of variability in its effects on student attainment, attitudes and retention (Bernard et al., 2004^[116]). Experts have therefore underlined the importance of the methods used for ICT-based instruction and the extent to which teachers and schools are supported in applying these techniques effectively. Since distance learning enables rural schools to expand their curriculum and course offer, a central question becomes how to select distance courses, effectively schedule them and design their delivery in a way that benefits all students.

One of the challenges commonly associated with distance learning is that its pedagogical benefits strongly depend on students' level of motivation and independence. For distance

learning to be effective for all participating students, it has therefore been recommended that students should be supported when necessary, for example through school-based facilitators that act as intermediaries between students and web-based teachers. Likewise, distance learning relies on the availability of adapted teaching materials and programmes have tended to be more effective where schools appoint a contact person to assist teachers with the use and maintenance of technology (Ares Abalde, 2014^[30]). The effective introduction of distance and technology-aided learning therefore requires serious preparation, including the development and provision of appropriate learning materials and training for teachers in rural schools (OECD/The World Bank, 2015, p. 123^[75]). The few empirical studies that consider the cost of distance education point to the significant initial investments required for its implementation as well as the recurring expenditure on maintaining and replacing its technological devices (Sipple and Brent, 2015^[42]).

Beyond instruction in the classroom, ICT can also be used to facilitate the professional development of teachers in remote areas, improve their access to learning materials and reduce their professional isolation. According to a recent literature review by Ares Abalde (2014^[30]), primary and secondary school teachers in remote Australian schools showed a greater need for professional development, and video conferencing or web-based systems were cost-effective and convenient ways to provide them with in-service education. Particularly in geographically isolated schools, where teachers lack opportunities for face-to-face interaction with their peers, ICT also provides a tool for peer learning and discussions on how to address common challenges they may face. Similar approaches could be used to establish mentoring relationships between teacher students and professionals in remote schools, since the challenges of teaching in small remote schools may not be sufficiently addressed in pre-service teacher training (Ares Abalde, 2014, p. 32^[30]).

While urban areas still enjoy a better coverage of modern communication technologies than rural areas, the gap has narrowed considerable in the last few decades across OECD countries (OECD, 2010^[62]). This includes access to broadband internet for bandwidth-intensive activities like videoconferencing, access to technical assistance and maintenance as well as the availability of professional development for the integration of technology (Centre for Education Statistics and Evaluation, 2013^[24]; Commission on the Delivery of Rural Education, 2013^[88]). In some countries, rural and remote regions still have limited access to broadband internet and the cost of infrastructural investments and qualified personnel can be an obstacle to both distance learning and remote teacher training (Ares Abalde, 2014, p. 32^[30]). Yet, PISA data collected from school principals in 2012 indicates that – with the exception of Mexico – most rural schools in OECD countries have computers with internet connections that can be used for educational purposes and few countries exhibit a significant rural/urban divide in school connectivity. In partner countries such as Colombia, Indonesia and Peru, by contrast, more than one in four students in rural areas and small towns did not have access to the internet through school computers, compared to fewer than one in ten students attending urban schools (OECD, 2015, pp. 132, Table 5.9a^[117]). On the other hand, PISA data also shows that several OECD partner countries, including Albania, Indonesia and Uruguay, made significant progress in closing the rural/urban connectivity gap between 2009 and 2012 (OECD, 2015, pp. 132, Table 5.9c^[117]).

The “Rural Connections” (*Enlaces Rural*) programme in Chile and e-resource projects in Ontario (Canada) provide recent examples of technological innovations alleviating disadvantages associated with the limited resources of remote schools (see Box 3.8). In Italy, the National Institute for Documentation, Innovation and Educational Research

(INDIRE) has supported the creation of a national network of small rural schools (*Piccole Scuole*) that uses technology to link classes with few students across different sites, while taking the widespread practice of multi-grade teaching and the community role of small schools into account. Uruguay's Ceibal Plan is another ambitious initiative aimed at expanding the availability and use of ICT across the country (Santiago et al., 2016^[46]).

Box 3.8. Using ICT to enhance students' access to learning resources in rural school networks

Uruguay: Expanding the use of digital material and ICT equipment through the Ceibal Plan

The "Ceibal Plan" is a major initiative in Uruguay that started in 2007 and aims to bring internet access and modern information technology to schools, promote digital literacy and expand the use of ICT in the learning process. Its main component has been the free distribution of laptops to students and teachers of public schools (at the primary and lower secondary levels). In addition, tablets with education content were distributed to pre-primary and Year 1 students as well as teachers as part of a pilot initiative in 2013.

The Ceibal Plan also involves a variety of programmes to support students and teachers, which includes training support teachers for the implementation of the Plan (Ceibal teachers, deployed to individual schools), internet platforms with educational content, the Ceibal library, the Ceibal English programme (videoconferencing classes for students in Years 4, 5 and 6) and the "Aprender Tod@s" programme, which promotes digital inclusion through school projects. In addition, the Ceibal Plan allows online formative assessments to be organised nationwide (in Years 3 to 6). The Ceibal initiative is administered by an autonomous organisation (the Ceibal Centre) and targeted at public schools, although private schools can participate on the basis of individual agreements (INEEd, 2015^[118]).

While evaluations of the programme indicate that the use of ICT in schools and classrooms is appreciated by families and the community, they also raise concerns that ICT is typically not used in innovative and effective ways to improve learning, and that school principals and teachers need further training to integrate ICT in the teaching and learning process. Similar concerns have been raised concerning the effective use of ICT in general and technical-professional secondary education. Nevertheless, the introduction of ICT in primary education has enabled schools to participate in regional or national courses and meetings through videoconferencing and has somewhat eased the administrative tasks of school leaders (e.g. through the Unified Management of Records and Information, GURI) (INEEd, 2015^[118]).

Chile: Providing digital teaching material and internet connectivity to rural schools through the "Rural Connections" programme

The "Rural Connections" (*Enlaces Rural*) programme was first introduced in 2000 to improve the quality of education in rural areas through technological infrastructure and teaching materials adapted for multi-grade settings. In 2013, the programme also provided digital teaching material internet connections to several rural schools (MINEDUC, ACE and ES, forthcoming). In 2014, a complementary program, Integrating Rurality (*Integrando la Ruralidad*), was implemented in 2 043 schools with limited internet access to provide them with offline digital resources.

Ontario (Canada): Blended learning and other ICT-supported strategies to widen access to teaching and care services

E-learning resources in Ontario include a virtual learning environment and a digital library of materials relevant to the Ontario curriculum. Students can use these to take courses fully online or to benefit from blended learning, which allows them to access resources during and outside school hours to supplement face-to-face lessons. In both approaches, the password-protected virtual learning environment provides a suite of tools allowing students to communicate and interact with their teacher and classmates. In rural and remote areas, better broadband connection is key to making e-learning a real option. The Ontario 2016 Budget committed to promoting equitable and affordable access to high-speed broadband services in Ontario's schools to support e-learning, but also the delivery of mental health and well-being services. An example is Ontario's Tele-Mental Health Service, which provides children and youth in rural, remote and underserved communities with access to specialized mental health consultations through videoconferencing. The Upper Canada District School Board in Eastern Ontario, one of the largest English public school boards by geographical area in the province, is making e-learning more widely available to ensure all students can access the courses they need to complete their secondary school diploma. The school board is diligently working to build capacity among e-learning teachers to ensure they understand and apply the most effective teaching techniques. This effort aligns with the school board's strategic plan and the declining enrolment that has led to discussions of closure and consolidation (Ontario Ministry of Education, 2017^[119]).

Sources: Santiago, P. et al. (2016), *OECD Reviews of School Resources: Uruguay 2016*, OECD Publishing, Paris, <http://doi.org/10.1787/9789264265530-en>; Santiago, P. et al. (2017), *OECD Reviews of School Resources: Chile 2017*, OECD Publishing, Paris, p. 94, <http://dx.doi.org/10.1787/9789264285637-en>; Ontario Ministry of Education (2017), *Supporting Students and Communities: A Discussion Paper to Strengthen Education in Ontario's Rural and Remote Communities*.

Leveraging community links and support from local stakeholders

Many rural schools are embedded in tight-knit communities, which consider them central to their social life and cohesion (Kalaoja and Pietarinen, 2009^[120]). This can generate a high level of parental involvement that some schools have successfully leveraged to ameliorate the challenges described above, even though these favourable conditions are not given in all rural settings. Earlier studies of rural education in the United States found that rural parents were *less* likely to be involved in school meetings or interact with teachers but attended more school events (Prater, Bermudez and Owens, 1997^[121]), while more recent studies observed that rural parents more frequently volunteer and participate in school activities than their urban counterparts (Provasnik et al., 2007^[122]). The latter is corroborated by evidence from the nine countries that distributed the PISA 2015 parent questionnaire. On average, across these nine countries, parents in rural schools reported to participate more in school activities, such as discussing their children's progress, volunteering, attending conferences and participating in the school government, than parents in urban schools³. Likewise, across the OECD countries participating in TALIS 2013, rural teachers were more likely to report a high level of co-operation between their school and the local community⁴.

To ensure the continued operation of small remote schools or ease their financial burden, local authorities in some countries have encouraged voluntary parental contributions and help from other community partners to sustain school facilities. In Scotland, for example, a recent commission on educational provision in rural areas found many examples of parent groups and voluntary organisations carrying out minor classroom improvements, maintenance works and tasks like snow clearance. In some cases, parental and community involvement has even been a mandatory condition for decentralisation initiatives, since it was seen as an effective and inexpensive way to enhance schools' capacity and educational quality (Gertler, Patrinos and Rubio-Codina, 2012, p. 78^[123]). While this form of community involvement usually does not cover a significant share of the schools' overall maintenance requirements, the use of local contractors or community members can strengthen the school's social ties and often comes at no cost or a lower price than conventional approaches (Commission on the Delivery of Rural Education, 2013, pp. 37, 49^[88]).

Nevertheless, the extent to which local actors are willing and capable of contributing to their local schools' operation varies and there is evidence to suggest that participatory schemes are least effective in the poor communities with low human capital that may rely on this support the most (Gertler, Patrinos and Rubio-Codina, 2012, p. 78^[123]). It is also important for community involvement to be carefully monitored so as to ensure that procurement, health and safety and building regulations are adhered to and the most effective use is made of public money. Yet, overly rigid regulations of volunteer or community involvement and a lack of transparency can create uncertainties and barriers that reduce the ability of rural schools to draw on local actors' support. In the Scottish case, for example, local authorities' approaches to procurement legislation, health and safety regulations varied widely, which often prevents school staff and parents from pursuing small actions to improve their schools. A commission therefore suggested adopting a more uniform and constructive approach that encourages schools to leverage their community links (Commission on the Delivery of Rural Education, 2013^[88]). The Polish "Small School" (*Mala szkoła*) programme described in Box 3.9 is another example of selective deregulation enabling a greater involvement of volunteers in running schools that might otherwise be forced to close (OECD/The World Bank, 2015, p. 124 f.^[75]).

Box 3.9. Enabling parental school governance in Poland

In order to facilitate the continued operation of small rural schools that might otherwise face closure due to financial pressures, the Polish government introduced the "Small School" (*Mala szkoła*) programme, which waives certain regulations and norms for parental associations taking on the governance of rural schools. The list of these lifted norms and what should replace them is clearly stipulated in education laws. Among these lifted norms are the requirements to employ cleaners or separate kitchen staff. Instead, the programme allows for these functions to be performed by parents on a voluntary basis, which significantly reduces the per-student costs. In addition, the voluntary engagement of parents has the potential to foster informal ties and improve the relationship between the school and the community.

Schools that participate in the Small School programme are entitled to receive funding from their local government. Due to the significant savings that participation in the programme generates, the maintenance costs of participating schools tends to be

substantially reduced, which gives local governments an incentive to encourage parental and community involvement. In practice, if a village community considers their school to be an important asset for their future, they can organise themselves and take over the management of the school. In doing so, they will often benefit from the direct support of their local government, for example by letting its lawyers help parents in establishing their association, adopting its statutes in conformity to the laws and finally registering it.

Source: OECD/The World Bank (2015), *OECD Reviews of School Resources: Kazakhstan 2015*, OECD Publishing, Paris, <http://doi.org/10.1787/9789264245891-en>.

Considering the role of rural schools in the context of regional economic developments

It is clear from the discussion above that not all of the problems experienced by small, isolated schools can be addressed without considering the wider context of regional development, the promotion of economic opportunity, local agency, and community sustainability in some rural areas. Declining student populations and the difficulty to attract qualified teachers in rural areas are at least in part a symptom and result of their more general economic decline. In addition, many rural communities grapple with the challenge to contain brain drain towards urban areas and the concern that local policies aimed at generating human capital spillovers might be undermined by students' increased mobility upon graduation (Carr and Kefalas, 2009^[124]). This leads to a paradoxical condition in which a municipality's effort to foster educational success may accelerate its decline, even though this may be less of a concern if the skills promoted are specific to a local industry (Neumark and Simpson, 2015, p. 1209^[126]).

Perceptions of local economic opportunities play an important role in shaping the aspirations of rural youth and their decisions to leave or come back after attaining higher levels of education (Petrin, Schafft and Meece, 2014^[125]). It is therefore clear that ensuring thriving and sustainable rural communities lies beyond the power of educational policies and schools alone, but requires a broader strategy to foster rural development. At the same time, regional economic development initiatives should acknowledge that improving the quality of rural education, particularly vocational programmes, can in some cases play a role in revitalising economic activity (OECD, 2008, p. 229^[127]). Schools can, for instance, integrate academic and vocational education through collaborations with local businesses, job shadowing, or school-to-work programmes. "Farm-to-school" programmes are another example of schools purposefully contributing to the development of rural communities by entering purchasing agreements between school meal operations and local producers, the cultivation of school gardens, and farm field trips (Schafft, 2016^[128]). Involving local educators and schools in the formulation of rural economic development plans and acknowledging the reciprocity between high-quality education and regional development can therefore be an important step towards improving the conditions for education in rural and remote areas.

3.5. Challenges and opportunities for the efficient and equitable provision of education in urban areas

Around half of the population in the OECD area and 60% of its gross domestic product (GDP) are concentrated in cities (OECD, 2016^[129]). Urban areas are therefore rightly recognised as engines of national prosperity. Yet, cities also exhibit higher levels of

inequality than rural communities, which raises the question of how to ensure that the benefits of their growth extend to all urban residents and beyond. In addition, the rapid growth of metropolitan areas and rising demand for school places exerts pressure on urban school networks to expand their provision.

Pressing demand and fluctuating enrolment create capacity challenges in some cities

Effectively meeting the rising demand for school places in high-density areas with limited space is a major challenge for the organisation of urban school networks. Many OECD review countries witness rising enrolment in urban schools due to inward migration and increased housing density. Policy changes that require additional capacity can compound the infrastructural pressures generated by demographic shifts. In Austria, for example, the expansion of all-day schooling has seen schools in cities like Vienna struggling to find sufficient space for the play areas, cooking facilities and teacher workplaces required for longer school days (Nusche et al., 2016, p. 144^[16]). The pressure on urban school networks to build or upgrade facilities can also intensify competition for limited infrastructure budgets and often leads to long queues and delays in construction projects.

Rapid urban growth and housing developments go hand in hand with increased educational demand. Following large-scale residential constructions, the number of school-age children commonly rises sharply and peaks after a few years before slowly subsiding again and stabilising, which may take multiple decades. Experience shows that this subsequent drop in student numbers can represent up to a 50% decrease compared to the peak population, which makes it difficult to find efficient responses to rising student demand. If local authorities were to meet the increase in student numbers by constructing sufficient new school buildings to accommodate the peak enrolment, a subsequent drop in enrolment can render them obsolete long before their investment has paid off. To avoid this “overbuilding”, some have suggested responding to temporary increases in enrolment by using existing facilities more intensively, implementing extended school years and double shifts, or complementing permanent school buildings with temporary facilities (Bray, 2008^[130]).

The expansion of urban populations, changing patterns of migration and residential mobility can lead to cyclical and unexpected fluctuations in the student population both between and within school years. The difficulty of predicting cohort sizes in areas with fluctuating student populations requires schools to be highly effective in planning the organisation of their classes and associated teaching needs while educational authorities need to support them in the face of changing enrolment patterns throughout the school year. At times, the need to quickly and efficiently create school places has led providers to turn to temporary and provisional solutions, such as prefabricated classrooms. Ensuring that these approaches to capacity expansion fulfil health and safety standards, provide a high-quality learning environment, and cater to diverse educational needs is another key challenge in the organisation of urban school networks.

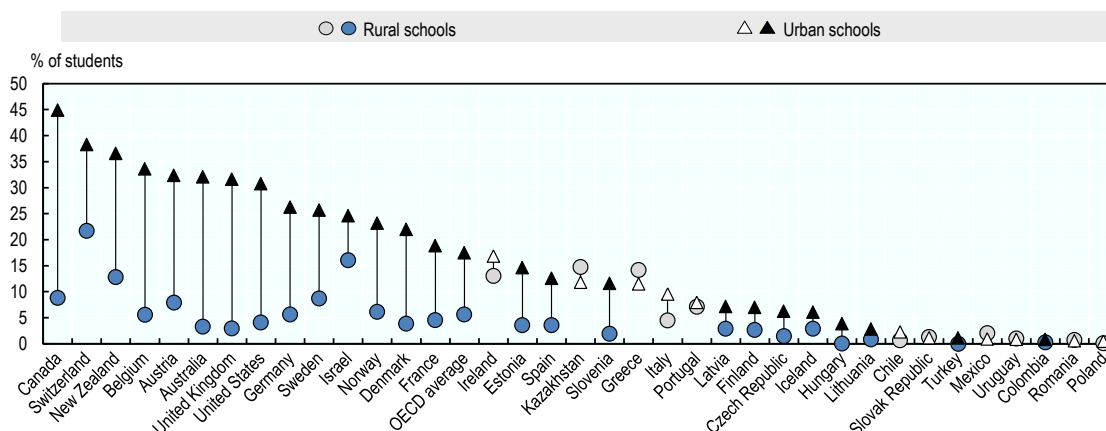
Although not limited to cities, the intensified influx of migrants and refugees in multiple European countries during the years following 2015 has aggravated the capacity shortages of some urban school networks. The Flemish Community of Belgium, for example, is committed to ensuring that every immigrant between the ages of 2.5 and 18 is integrated in a school within 60 days of their arrival and similar measures exist for higher education, language and professional training for adults. Most OECD systems strive to ensure access to all levels of compulsory education, often supported by targeted funding

channelled from the national level (OECD, 2018, p. 177_[131]). Since many European countries use dispersal mechanisms to steer the distribution of asylum seekers, they tend to be more evenly distributed across urban and rural areas than other migrants (OECD, 2018_[131]). Nevertheless, a significant share of them chooses to leave their initially assigned place of residence and resettle to larger cities. Urban schools may have more experience in the integration of migrant students than rural ones but also tend to have less capacity to support them. Altogether, in light of these demographic challenges, scarce facilities and a context of increasing fiscal pressure, authorities developing urban school networks need to be highly strategic, analyse short- and long-term trends in educational demand and carefully assess the viability of temporary responses to its fluctuations.

A highly diverse student population

Cities exhibit a higher cultural and ethnic diversity than rural communities, partly because recently arrived migrants seek to benefit from the job opportunities and social networks that more densely populated urban areas provide. PISA 2015 data confirms that, in almost every OECD country, the share of students with an immigrant background (i.e. those with foreign-born parents) is higher in urban schools than in rural schools, particularly so in the countries with larger shares of immigrants overall (see Figure 3.6). In Canada, for instance, about 45% of students in urban schools have an immigrant background, compared to just 9% in rural schools. Similarly pronounced rural-urban differences exceeding 20 percentage points can be observed in Australia, Austria, Belgium, Germany, New Zealand, the United Kingdom and the United States.

Figure 3.6. Share of students with an immigration background by school location, 2015



Note: Statistically significant differences are marked in a darker tone. Rural schools are those located in rural areas or villages with fewer than 3 000 inhabitants, urban schools are located in cities with 100 000 inhabitants or more.

Source: OECD (2015), PISA 2015 Database, www.oecd.org/pisa/data/2015database/.

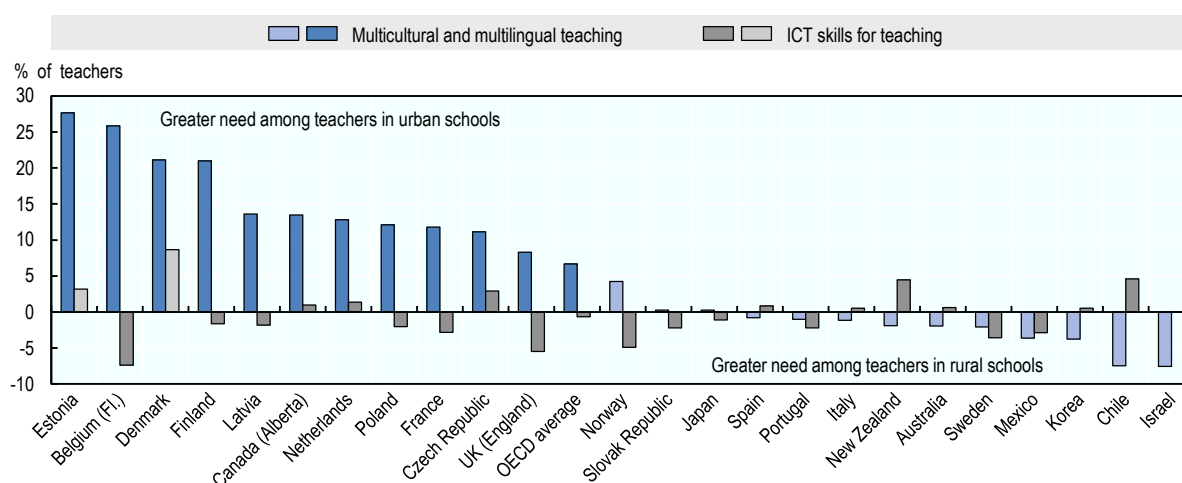
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Teaching a multicultural and multilingual student body requires specific training and skills, which need to be reflected both in the initial teacher training and schools' hiring practices. In at least half of the OECD countries participating in TALIS 2013, urban teachers reported a greater need for professional development in multicultural and

multilingual teaching than their rural colleagues (Figure 3.7). Some urban schools are also called upon to co-ordinate social services provided by a range of providers to accommodate students with limited or interrupted formal education or those suffering from post-traumatic stress disorder (PTSD). In areas with high levels of residential mobility and student fluctuation. In addition, schools and teachers need to navigate uncertain cohort sizes and may have less time to establish rapport in the classroom due to a large number of students arriving and enrolling half-way through the school year. These difficulties are compounded if arriving students require specific support to overcome language barriers and socio-economic disadvantages or spent considerable time out of school.

Figure 3.7. Professional development needs of urban and rural teachers, 2013

Difference in the percentage of teachers reporting at least some need for professional development



Note: Statistically significant differences are marked in a darker tone. Rural schools are those located in rural areas or villages with fewer than 3 000 inhabitants, urban schools are located in cities with 100 000 inhabitants or more.

Source: OECD (2013), TALIS 2013 Database, http://stats.oecd.org/Index.aspx?datasetcode=talis_2013.

StatLink  <https://doi.org/10.1787/888933831336>

Greater choice but also a high degree of social segregation and academic stratification

A high density of school providers and students can enable urban areas to provide their residents with a rich educational offer. Other than in sparsely populated rural areas, schools in cities also frequently compete with one another for enrolment, giving families a choice between multiple providers. Yet, a larger number of schools and diverse educational offer also entails the risks of stratification and segregation. Cities in many OECD review countries are not only characterised by a highly diverse population, but also by its uneven distribution. Residential segregation along socio-demographic lines combined with differential school choice behaviour often means that some students benefit less than others from the educational opportunities in urban school networks.

Students in cities benefit from a wider array of learning opportunities to match their interests and needs

The opportunity to learn and to follow their interests is a vital part of students' school experience. Particularly as they progress through secondary education, a broad offer of courses gives students the opportunity to explore and to specialise based on their interests and needs. Research suggests that taking additional courses is an important factor for students' achievement and their transition to further education (Lee et al., 1998^[132]; Schneider, Swanson and Riegle-Crumb, 1998^[133]; Wang and Goldschmidt, 2003^[134]; Irvin et al., 2017^[135]).

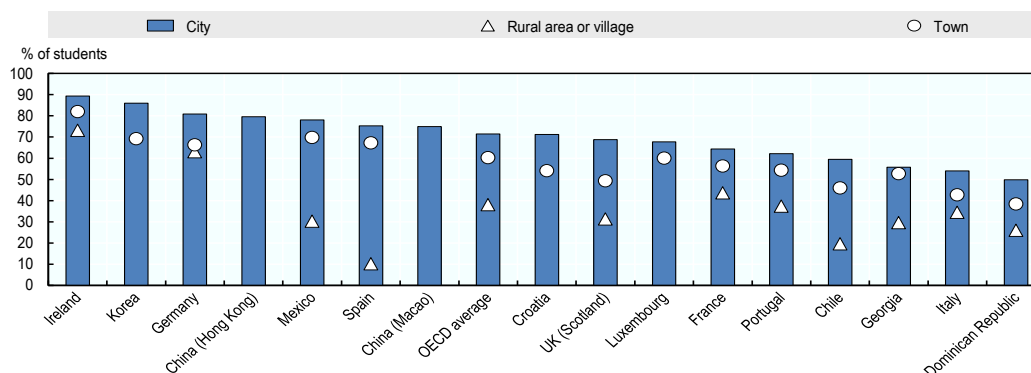
Compared to rural areas, urban school networks are usually able to offer a broader variety of course options and extracurricular activities due to the greater number of participating students and the availability of teachers with the requisite skills and expertise. However, not all students may take advantage of a larger curricular offer, the possibility to take higher level courses or participation in extracurricular activities and better performing students tend to benefit the most from them (Slate and Jones, 2005^[136]; Leithwood and Jantzi, 2009^[29]). This may be part of the explanation why, in most OECD countries, a large share of top performing science students in PISA 2015 is concentrated in urban schools⁵. This tendency is particularly pronounced in some of the Latin American countries taking part in PISA 2015, including Brazil, Colombia, Mexico and Uruguay while Belgium, the United Kingdom and the United States are notable exceptions.

Given the greater concentration of schools in urban areas, students and parents living in cities also stand to benefit most the choice between different providers according to their needs and preferences. While many school systems continue to assign students to their neighbourhood schools (particularly at the primary level), an increasing number of OECD countries have expanded parents' and students' rights to choose their school over the past decades (Heyneman, 2009^[137]). In the United States, for example, school choice options for families have grown significantly since the 1990s. Families can choose among traditional public schools, charter schools, magnet schools, and out-of-district public schools in addition to religious and non-sectarian private schools (Butler et al., 2013^[138]).

In all sixteen countries with available data that administered the PISA parent questionnaire, schools in cities are most likely to compete with one another for student enrolment (Figure 3.8). In Ireland, Korea and Germany, more than four in five parents in cities reported that their child's school competes with at least two others. On average across the OECD, students in cities are also more likely to attend a private school than their peers in towns or rural areas. In Chile, a country with a long history of school choice, and Spain, the share of students enrolled in a private school is around 50 percentage points higher in cities than in rural areas. Notable exceptions to this pattern include Slovenia, where private schools are more common in rural areas (OECD, 2016, pp. 458, Tables II.4.10 and 4.14^[15]).

Figure 3.8. Degree of school competition by location, 2015

Percentage of students whose parents reported that their school is competing with two or more other schools for enrolment



Note: Rural areas or villages are defined as communities with fewer than 3 000 people, towns as those with 3 000 to 100 000 people, and cities as those with more than 100 000 people.

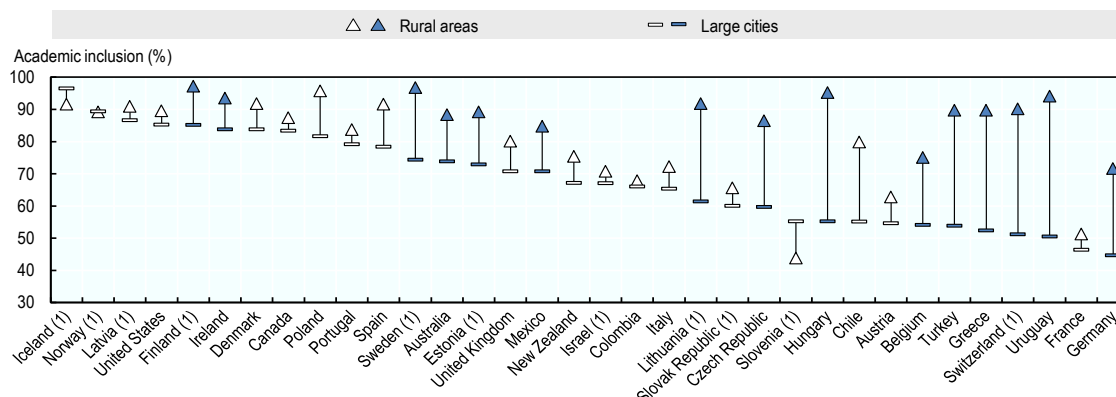
Source: Authors' analysis, OECD (2015), PISA 2015 Database, <http://www.oecd.org/pisa/data/2015database>.

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If families have adequate information and choose schools based on their educational quality, one would expect parental choice to incentivise schools to improve their performance and organise their offer in ways that better match students' interests and needs (Friedman, 1955^[139]; Chubb and Moe, 1990^[140]). Wößmann et al., (2007^[141]), for example, find that in urban areas with more schools to choose from, students who are not restricted to attend their local school and who report that they attend their school because it is better than the available alternatives have higher achievement. However, various studies have questioned the validity of the assumptions underlying school choice, including parents' access to information about school quality (Schneider et al., 1998^[142]; Berends and Zottola, 2009^[143]; Lacireno-Paquet, 2012^[144]) and there is evidence that some forms of school choice can lead to greater segregation between schools (Ladd, 2002^[145]; Valenzuela, Bellei and Rios, 2014^[146]).

Segregation can undermine the efficiency and equity objectives of school choice

The wider range of educational options available to students in urban areas also entails a greater risk of segregation. Data from PISA 2015 provides some insights into the extent of academic and socio-economic segregation in urban areas. Comparing schools in large cities (with over 1 000 000 people) with schools in villages, hamlets or rural areas (with fewer than 3 000 inhabitants), students in urban schools are both academically and socio-economically more segregated than those in rural schools. In 15 of the 34 OECD member states and review countries with available data, cities had significantly lower scores on the PISA index of academic inclusion than rural areas, which means that students with different academic abilities are less likely to attend the same schools (see Figure 3.9). The same is true of students from different socio-economic backgrounds in all but a few countries, as indicated by the OECD index of socio-economic inclusion. In 15 of the 35 OECD member states and review countries, students from different socio-economic backgrounds were significantly less likely to attend the same schools in urban compared to rural areas (see Figure 3.10).

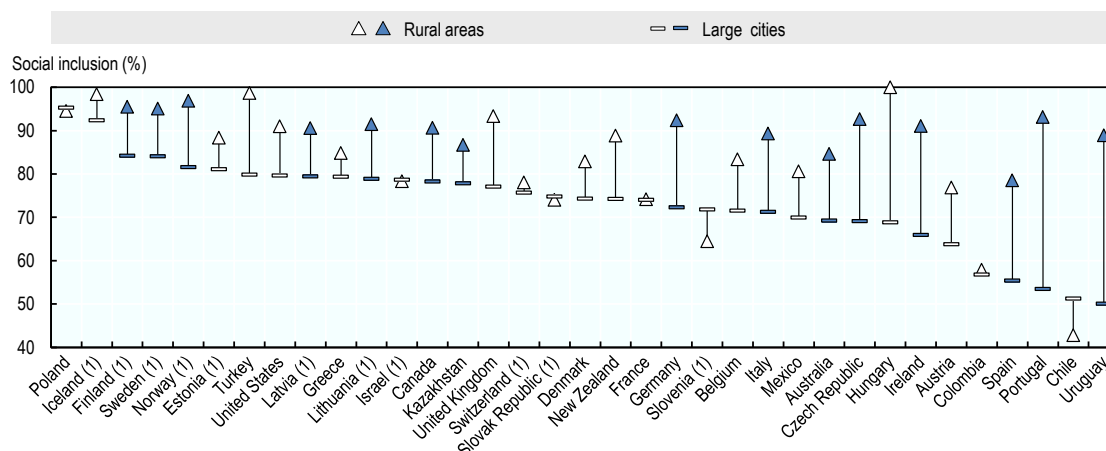
Figure 3.9. Academic inclusion across schools in science performance by location, 2015

Note: Statistically significant differences are marked in a darker tone. Academic inclusion refers to the extent to which students with different academic abilities attend the same schools. The index of academic inclusion is the ratio between the within-school variation in science performance and its overall variation at the system level (between and within schools). Rural areas are communities with fewer than 3 000 inhabitants, large cities are those with more than one million inhabitants.

1: The results are based on cities with between 100 000 and one million inhabitants.

Source: OECD (2015), PISA 2015 Database, www.oecd.org/pisa/data/2015database/.

StatLink  <https://doi.org/10.1787/888933831374>

Figure 3.10. Social inclusion across schools by location, 2015

Note: Statistically significant differences are marked in a darker tone. Social inclusion refers to the extent to which students with different socio-economic status attend the same schools. The index of social inclusion is the ratio between the within-school variation of the PISA index of economic, social and cultural status (ESCS) and its overall variation at the system level (between and within schools). Rural areas are communities with fewer than 3 000 inhabitants, large cities are those with more than one million inhabitants.

1: The results are based on cities with between 100 000 and one million inhabitants.

Source: OECD (2015), PISA 2015 Database, www.oecd.org/pisa/data/2015database/.

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School segregation, to the extent that it results from direct or indirect exclusion, is considered an infringement of students' rights not to be discriminated against with respect to their educational opportunities (Council of Europe Commissioner for Human Rights, 2017^[147]). Despite many countries' firm public stand and legislation against discrimination, the marginalisation of disadvantaged and vulnerable populations within school systems remains a concern, not least in light of the increased arrival of migrants and refugees across Europe. Despite positive examples of successful integration initiatives, many countries have yet to develop effective mechanisms to secure refugee children's right to benefit from mainstream education and enable schools to address the needs of recently arrived migrant students (OECD, 2018^[131]). At the same time, marginalised communities and ethnic groups like Roma and traveller children continue to be seriously affected by segregation in some education systems where they are disproportionately confined to special needs classes or schools with an exceedingly high proportion of Roma students (Council of Europe Commissioner for Human Rights, 2017, p. 9^[147]).

Besides the ethical case against marginalisation and exclusion, evidence suggests that a reduction in school segregation has the potential to benefit minority students and improve educational achievement in the aggregate (Hanushek, Kain and Rivkin, 2009^[148]). While the confinement of disadvantaged students to low-quality schools from an early age has been shown to have severe long-term consequences for their educational achievement and life trajectory, segregation also deprives advantaged children of the opportunity to acquire important social and life skills through the interaction with children from different social, ethnic and cultural backgrounds or abilities (Council of Europe Commissioner for Human Rights, 2017, p. 13^[147]). Across the systems participating in PISA, those with the highest index of social inclusion are also the ones that performed best in the mathematics test in the PISA 2012 survey (OECD, 2013^[3]) – an effect that may reflect peer effects and the disproportionate benefits that accrue to disadvantaged students from interacting with high-achieving peers.

Although rising social heterogeneity at times has been argued to pose a threat to social cohesion (Putnam, 2007^[149]), recent evidence points to segregation and the absence of positive inter-group contact as a key factor that mediates the relationship between diversity and generalised social trust, which is of ever greater importance in the face of increased migration flows and growing inequality (Uslaner, 2012^[150]; Borgonovi and Pokropek, 2017^[151]). From this perspective, living and learning in integrated, heterogeneous communities can give students the opportunity and confidence to interact with peers from different backgrounds and develop the global competences they need in an increasingly diverse and interdependent global economy (Asia Society/OECD, 2018^[152]).

Segregation in public school systems can take many forms and arise due to different mechanisms. Some of them are based on decentralised household decisions, while others are based on deliberate educational policies, such as the tracking of students into separate schools. Most commonly, school sorting based on income and other student characteristics emerges from residential segregation or parents' decision to opt out of traditional public schools (Nechyba, 2006^[153]). The dynamics that underlie social segregation are complex, hard to predict, and often self-perpetuating or subject to positive feedback (Schelling, 1971^[154]). In public school systems, the effects of peer composition, household resources and other non-financial inputs can contribute to sorting and differences in school quality even where local school funding is equalised across jurisdictions. The subsequent effects of school quality on house prices can directly or

indirectly constrain disadvantaged families' choice of public schools, and cause persistent sorting patterns in equilibrium (Nechyba, 2006^[153]). At the same time, families may avoid or seek to withdraw their children from schools with a rising proportion of disadvantaged and minority students. Since schools catering to a large number of disadvantaged and vulnerable students require more human and financial resources and strong leadership to maintain their quality, the onset of segregation can further diminish their ability to attract students and thereby exacerbate between-school polarisation.

While residential segregation can place significant constraints on the equitable access to high-quality education, policies moderate the extent to which segregation across neighbourhoods translates into segregated schooling. The concentration of socio-economically disadvantaged students in highly urbanised countries with free school choice, such as Belgium, often exceeds what might be expected based on their degree of residential segregation alone (OECD, 2015^[155]). The definition of catchment areas plays an important role in this relationship since school districts that coincide with homogenous neighbourhoods are more likely to perpetuate concentrated disadvantage than those that encompass populations with diverse social and economic characteristics. Assignment mechanisms can also serve to de-couple enrolment from students' place of residence to some extent. Even in open-enrolment systems, however, the cost of transport can diminish the accessibility of desirable schools for families living at a greater distance.

Additional factors that contribute to school segregation, besides residential patterns, include parental choice and schools' admission policies (Karsten, 2010^[156]). Subject to its regulatory framework, parental choice shapes the extent to which families of higher socio-economic status can withdraw their children from disadvantaged or ethnically diverse local schools as well as the extent to which high-performing schools are accessible to disadvantaged students from elsewhere (see Chapter 2). These mechanisms are particularly well-documented in school systems that financially encourage parental choice and competition between public and private providers, but can equally occur within networks of predominantly public schools with heterogeneous quality and student-composition (Boeskens, 2016^[157]).

Parents tend to display behavioural biases toward the demographic characteristics of their children's peers. Surveys of Dutch parents, for example, show that ethnic composition is an important factor when choosing a school, particularly among native parents (Karsten et al., 2003^[158]). Permitting parents to choose their children's school can therefore lead to so-called "native flight" in disadvantaged areas (Rangvid, 2010^[159]). Inadequate regulations of school admissions procedures, including the permission to select students based on economic or academic ability can further exacerbate segregation, as does the failure to ensure that all parents possess the information necessary to take advantage of school choice provisions (OECD, 2017^[160]; Musset, 2012^[161]).

The procedure for enrolling students after the regular start of the school year deserves particular attention when addressing the concentration of disadvantaged and vulnerable student populations. In some systems, the integration of late-arriving students is particularly resource intensive, not least due to the high proportion of migrant and refugee children among this population. Unless authorities ensure their even distribution, late-arriving students may be concentrated in schools that are already stretched for resources. Assigning students to schools with sufficient capacity while avoiding to place an additional burden on schools whose lack of demand reflects existing quality concerns is an important challenge to be addressed (Council of Europe Commissioner for Human Rights, 2017, p. 25^[147]).

School segregation is tightly connected to students residency patterns and mobility

Students' place of residence can have a direct impact on their educational trajectory. Empirical evidence consistently shows that growing up in disadvantaged neighbourhoods with low-quality schools has a detrimental effect on children's academic pathways and development of cognitive skills (Sharkey, 2016^[162]). Evaluations of the Moving to Opportunities programme in the United States show that children's place of residence has a significant long-term impact on their educational and employment trajectory (Chetty, Hendren and Katz, 2016^[166]) and studies of European cities confirm that living in socially and economically disadvantaged areas exerts a penalty on people's employment prospects (Dujardin, Selod and Thomas, 2008^[167]).

Even though assignment mechanisms and enrolment policies can attenuate the effect of residential segregation on diversity in schools, improving the co-ordination between housing or transport policies and the planning of urban school networks is vital to reduce the concentration of disadvantaged students in poorly resourced schools. Residential segregation can exacerbate stratification with respect to a wide range of life outcomes, diminish mobility and restrict access to vital services, including but not limited to education. Highly segregated cities risk to aggravate spatial mismatch, preventing segments of the population from accessing the opportunities and services that would enable them to realise their potential and fully participate in the economic process (OECD, 2016^[129]). Conversely, a high degree of school segregation can reinforce housing segregation if socio-economically advantaged or ethnic majority households decide to leave diverse neighbourhoods because they prefer majority-dominated schools (Karsten, 2010^[156]).

Comparing levels of segregation across jurisdictions presents methodological challenges (OECD, 2016^[129]) but there is a general consensus that spatial segregation by income has increased in US metropolitan areas since the 1970s (Reardon and Bischoff, 2011^[165]; Rothwell and Massey, 2010^[166]) and has been on the rise in most European capital cities since at least the turn of the century (Musterd et al., 2017^[167]). The causes for residential segregation are complex and can be both a product and a driver of economic inequalities. While high-income households tend to isolate themselves by opting to reside in residential enclaves, poverty in cities tends to concentrate in disadvantaged neighbourhoods with affordable housing. At the same time, areas that are less spatially segregated and unequal have been shown to exhibit higher intergenerational income mobility (Chetty et al., 2014^[168]). This reciprocal relationship between social inequality and spatial segregation is moderated by a range of factors including past and present housing and planning regimes, welfare systems, and public transport (Musterd et al., 2017^[167]). In the United States, for example, restrictive zoning, lot size restrictions and density regulations forestalling the construction of affordable housing in suburbs have contributed to the increase in spatial segregation (Rothwell and Massey, 2010^[166]).

In fiscally decentralised systems, locally raised school funding constitutes one mechanism by which residential segregation can translate into variations in educational quality across neighbourhoods. The funding of many American schools, for example, is linked to locally raised taxes and property values, providing schools in wealthy areas with more resources. These locally financed investments can, in turn, lead to rising house prices and property taxes, displacing lower-income residents and further increasing the desirability advantaged districts (Bayer, Ferreira and McMillan, 2004^[169]). A study of Californian districts that narrowly passed referenda for infrastructural investments found home prices

to increase significantly following the passage of a bond. Even though there was little evidence that investments changed the affected neighbourhoods' residential composition, rising home prices may set in motion self-perpetuating segregation dynamics in the longer-term (Cellini, Ferreira and Rothstein, 2010^[170]). More generally, differences between the quality of public goods provided across jurisdictions have been shown to encourage sorting based on residents' preferences and ability to pay for these provisions. This might be one reason why administrative fragmentation and the local variation in the provision of public services that comes with it, is positively associated with income segregation (Boulant, Brezzi and Veneri, 2016^[171]).

Even in systems with national funding formula and a homogenous allocation of resources across neighbourhoods, residential sorting can reduce disadvantaged students' access to attractive schools with a desirable peer composition. Gingrich and Ansell (2014^[172]) show that public schools in English districts with high housing prices do not only perform better on average, but also exhibit greater academic dispersion. Consistent with residential sorting, the benefits of this variance in school quality mostly accrue to high-income families that can afford to live in a district's most desirable neighbourhoods. Even in school networks with little between-school variance in student achievement, for example in Helsinki, parents' perceptions of school quality can be reflected in housing prices and reinforce residential segregation, especially in high density areas with an inelastic supply of land. Since measures of school quality are not publicly available in Finland, this effect appears to be primarily driven by parents' perceptions of a school's socio-demographic student composition (Harjunen, Kortelainen and Saarimaa, 2018^[173]).

Since proximity and convenient transport options are important criteria in families' school choice, improving connections between different neighbourhoods or peripheral areas and urban centres can expand students' access to attractive schools (Chingos and Blagg, 2017^[174]). However, as discussed in Chapter 2, not all students may benefit equally from these opportunities. In Mexico City, where school enrolment is based on a competitive admissions process, high achieving students from advantaged socio-economic backgrounds appear to have benefited the most from an expansion of the public transit network to choose distant high-performing schools (Dustan and Ngo, 2018^[175]). Although income-dependent transport subsidies can increase accessibility for disadvantaged students, policy makers need to carefully consider how they interact with school admissions criteria, in order to avoid incentivising parents to trade in school quality for lower transport costs (Masi, 2018^[176]).

3.6. Strategies to adapt urban school networks

Despite considerable territorial variation across and within countries, school networks in urban areas face distinct challenges that require responses tailored to their specific conditions. In contrast to most rural areas in OECD review countries, cities continue to experience growing student populations and pressures to expand their school network's capacity. In 2016, for example, cities in the French Community of Belgium expected a shortage of 20 000 school places by 2022, despite ongoing efforts to expand its capacity. The government's strategy proposed a great variety of policy measures to meet this challenge: encouraging schools with excess capacities to modify their educational offer, re-directing students towards schools with vacant places, expanding existing capacities through an efficient use of space, extending facilities and school places in existing schools, acquiring new infrastructure and finally, the construction of new school buildings (International Relations Directorate of the Federation Wallonia-Brussels,

2016^[109]). Responding appropriately to capacity shortages in the school network relies on the accurate identification of their causes, scope and expected duration, which in turn requires reliable monitoring mechanisms (see Chapter 2).

Besides mismatches in the aggregate supply and demand of capacities, many urban schools also require support in dealing with significant enrolment fluctuations over the course of the year and serving a student population whose complex needs may require them to co-ordinate social services and targeted support. While the number and density of school providers in cities could provide students with a rich educational offer close to their homes, the distribution of students across the network is often highly segregated, which raises the question of how to ensure that all students benefit from this potential. The following section offers a discussion of strategies to adapt urban school networks in response to these challenges.

Expanding the capacity of existing schools

Expanding the capacity of the school network in response to increased demand may not need to involve the construction of new, permanent school facilities. Particularly when increases in student enrolment are expected to be temporary or when they occur too rapidly and unexpectedly for new constructions to offer sufficient relief, modifications to the school network's existing infrastructure can be a promising strategy. While some of these adjustments can yield a lasting increase in the school network's capacity, others are temporary solutions designed to alleviate exceptional capacity shortages. Contingency plans that provide guidelines and strategies for infrastructural responses to unexpected increases in student enrolment can help schools and local authorities in their decision of how to expand the capacity of their schools in the short term. Depending on the causes of rising student enrolment and its expected duration, the merits of these strategies need to be weighed against those of longer-term expansions and the construction of new facilities, as discussed further below.

Identifying excess capacity or increasing student intake through the effective use of space

Perhaps the quickest and least invasive way for a school network under pressure to accommodate additional students is to identify and effectively put to use spare capacities. Part of the French Community of Belgium's strategy to address its significant shortage of school places is to identify schools with excess capacity and directing students towards them or encouraging them to offer courses that are in higher demand. At the same time, selected schools were encouraged to create additional school places by more efficiently using their space (International Relations Directorate of the Federation Wallonia-Brussels, 2016, p. 23^[109]). As described in Box 3.10, the French Community of Belgium has implemented a four-stage process to support schools in optimising their capacity (Smoos, 2017^[177]).

Box 3.10. Optimisation of surface area use in the French Community of Belgium

To improve the occupancy rate of school buildings, the French Community of Belgium follows a four-stage process. First, an inventory of schools' overall surface area and enrolment is used to identify facilities with potential over- and under-capacities. For selected schools, the overall surface area and space for specific purposes such as physical education or recreation are then compared to national norms. If significant over- or under-capacities are confirmed, authorities initiate an on-site investigation. In case the initial assessment is validated, a working group of the Ministry of Education (*Administration générale de l'Enseignement*, AGE) and the Ministry of Infrastructure (*Direction générale de l'Infrastructure*, DGI) is deployed to further analyse whether a reorganisation of the premises might yield a more efficient use of space.

Source: Smoos, M. (2017) *Pour un usage plus efficace de nos ressources scolaires* (presentation).

Even in times of exceeding demand, maximum class size rules and a limited number of teachers may restrict how many students a school can accommodate. In some OECD review countries, however, class size regulations are applied with some flexibility, allowing school providers to exceed the legal threshold under exceptional circumstances or for a limited period of time. In Estonia, for example, school providers are permitted to surpass maximum student numbers in a specific class for one academic year, provided that all health and safety requirements are met and the school principal's proposal is approved by the board of trustees (Ministry of Education and Research, 2015^[107]). Schools can also repurpose facilities to serve as additional classrooms and accommodate so-called "bulge classes" to cope with temporary increases in student enrolment. While increasing the student intake beyond a school's originally envisaged capacity may offer an expedient and low-cost response to excess demand, the negative impact it can have on the learning environment and teaching personnel usually makes it unsuitable as a long-term solution.

School facility extensions

Extensions of existing school facilities can take multiple forms and serve either as temporary or permanent solutions to capacity shortages. In some systems, prefabricated and portable infrastructures are increasingly deployed to cope with excess demand. Such temporary classrooms must not only meet minimum health and safety requirements but also provide a high-quality learning environment (OECD, 2011^[178]). Most commonly, they are used to deal with fluctuating enrolment, with immediate capacity needs in the absence of sufficient time or capital funding for permanent constructions, or during renovation works. Portable facilities are intended to be quickly deployed or dismantled and tend to be relatively cheap compared to the construction of permanent infrastructure, not least because providers may recuperate some of their cost when reusing, reselling or renting them out after their initial deployment. Even though portable classrooms are designed to serve as temporary facilities, their number has grown continuously in the United States over the past decades and they often remain in use at a given site for years.

The funding responsibilities for temporary classrooms vary across systems. During the 1990s, the US state of California strongly incentivised schools to invest in temporary classrooms, requiring all new state-funded school constructions to consist of at least 30 % portable facilities in order to increase the school network's flexibility. In many

US states, however, the acquisition of temporary facilities is not supported by state capital funding but rather by school districts' reserve funds and locally raised taxes. Expanding school districts thus need to carefully consider whether it is worth investing in new or re-used temporary facilities and if so, for how long they can efficiently use them, taking into account their depreciating re-sale value, comparatively quick deterioration and increasing maintenance cost. Where the rise in student enrolment is predicted to last, permanent school expansions might be the more cost efficient solution.

Experimental evidence points to the significant impact that the built classroom environment and factors such as light, noise and temperature can have on students' performance (Marchand et al., 2014^[179]). Given that portable classrooms are primarily constructed to minimise costs and maximise flexibility, concerns regarding their suitability as learning environments therefore need to be taken seriously. Some portable classrooms suffer from poor insulation and ventilation, the lack of amenities including running water, compromised safety and low energy efficiency (Chan, 2009^[180]). Nevertheless, significant progress has been made over the past decades to innovate and improve their quality. Evidence from qualitative case studies and descriptive survey analyses suggested that portable classrooms need not have a negative impact on student behaviour and achievement or teacher satisfaction (Chan, 2009^[180]) and more robust fixed-effects models suggest that the effect of mobile classrooms on student achievement is net positive when they are used to ease acute overcrowding (McMullen and Rouse, 2012^[181]).

Rescheduling the use of school buildings

In some OECD review countries, the capacity of existing school facilities has been expanded by reorganising the time at which students use school buildings. Although less frequently used in developed economies, multi-shift schooling has had a particular appeal in urban areas where potential for new constructions is limited and the population density is sufficient to find enough students to operate multiple shifts in the same school. Double- or multi-shift systems thus permit major savings in land, buildings, equipment, and other facilities and provide a means to reduce class size or alleviate overcrowding without purchasing new permanent or temporary facilities (Bray, 2008^[130]).

In Uruguay, urban secondary schools typically operate in two shifts (*turnos*), providing students with four hours of instruction either in the morning or in the afternoon. In some cases, they also provide an evening shift (*turno nocturno*) for older students who may need to combine their studies with work commitments. By contrast, full-time and extended-time schools in Uruguay teach seven or seven and a half hours respectively, while most schools in rural areas provide five hours of instruction per day (Santiago et al., 2016, pp. 79, 180^[46]). In 1996, Chile moved away from its double-shift system towards a full school day, increasing students' time for instruction and extracurricular activities (Santiago et al., 2017, p. 53^[182]). The reform required a considerable investment in school infrastructure and resources for hiring additional teachers, but evidence suggests that it had a positive effect on student achievement in both language and mathematics (Bellei, 2009^[183]). Kazakhstan has also invested in additional school places to reduce its reliance on multi-shift education in urban schools. Following the construction of 106 new schools, the country halved the number of students in triple-shift schools between 2007 and 2011, although the use of double-shift classes remains the norm (OECD/The World Bank, 2015, p. 96^[75]).

While multi-shift schedules allow for a highly efficient use of school facilities, it is important to bear in mind its effects on the quality and time of instruction. Implementing multi-shift systems can result in reduced teaching hours, a more stressful learning environment due to shorter breaks, and more limited opportunities for remedial or enrichment classes. Evidence from Eastern Europe also shows that students attending afternoon shifts received slightly lower results, possibly due to students' and teachers' fatigue or the limited time left for after-school study (Lusher and Yassenov, 2016^[184]). Some systems have therefore experimented with rotating schedules to avoid inequities arising from some students sorting into more desirable shifts (Bray, 2008^[130]). Some schools have sought to compensate for the reduced teaching time in double-shift systems with a greater reliance on homework assignments, extended school terms or Saturday schooling. Schools can also set aside extra rooms for teachers to organise remedial tuition and for students to do their homework (Bray, 2008^[130]).

Although the economic benefits of double-shift schooling may be considered to outweigh educational concerns in specific contexts, they have added to the negative public perception of shift schooling. Proposals to introduce or prolong are therefore frequently met with parental opposition (Linden, 2001^[185]). If double-shift arrangements are conceived of as a temporary expedient, Linden (2001, p. 8^[185]) argues, they are unlikely to attract support and the resources they need to operate effectively. In contexts where the universal attendance of single-shift schools is not conceivable in the near future, authorities should therefore acknowledge this and invest in making double-shift arrangements as effective as possible.

Year-round calendars and extended school terms are another way of rescheduling the use of school buildings to expand their capacity. Rather than using facilities at different times during the day, year-round calendars make use of school buildings for the entire calendar year, separating students into one of multiple tracks, at least one of which is on holidays at any given point. This allows schools to accommodate more students in the same space by reducing the time at which they remain unused for instruction (Gromada and Shewbridge, 2015^[186]). In Wake County, North Carolina (United States), where around 20% of students attend year-round schools and modified calendars have been in use since the early 1990s. The introduction of year-round school calendars increased infrastructural capacity by 20-33% and empirical analyses suggest that it had a small negative impact on achievement, all else equal, but a positive effect in crowded schools (McMullen and Rouse, 2012^[181]).

Constructing sustainable school buildings in line with increased long-term demand

Ensuring that the school network responds effectively to increased student enrolment requires strategic foresight and the capacity to distinguish long-term trends from short-term fluctuations. Responding effectively to cyclical and unexpected changes in student enrolment is a significant challenge in urban school networks trying to avoid costly “overbuilding” and prematurely relinquishing capacities that may be required to cope with future spikes in enrolment. Particularly in dense, built-up environments, the high cost of land acquisition and regulations such as minimum site size rules can render the construction of new school buildings difficult. In addition, some funding mechanisms for school constructions are primarily geared towards particular forms of urban growth, such as suburban expansion, rather than population increases in central areas (Vincent, 2006^[187]). Strategies for the sustainable expansion of school infrastructure therefore need to ensure that the number of high-quality school places keeps up with longer-term

increases in educational demand and is responsive to the needs of different urban environments.

Strategically opening schools in locations under high demographic pressure is a common approach to alleviate overcrowding. As described in Chapter 2, school mapping tools supported by Geographic Information Systems (GIS) can facilitate this process and ensure that additional capacity is created where it is most needed. Some large urban school districts in the United States, including Los Angeles, New York and Chicago, have seized the opportunity to integrate the construction of new facilities within a wider school improvement strategy and combined adjustments in the number of schools with their qualitative enhancement. Previously, between 1997 and 2008, five bond issues worth a total of USD 20 billion had enabled the Los Angeles Unified School District (LAUSD) to fund the construction of 131 new schools, which helped to alleviate crowding and reduced bussing expenditures, but failed to improve students' performance. Between 2010 and 2013, the construction of 74 additional schools was accompanied by a concomitant educational reform – the Public School Choice initiative. It gave school leaders greater autonomy and allowed public and private organisations to apply for the operation of low-performing district schools and newly opened relief schools based on evidence-based improvement plans. Evaluations of the initiative suggest that, net of the effect of reduced overcrowding, newly opened school facilities had a positive longer-term impact on achievement after an initial two-year decrease in students' performance following their relocation to a new school (Hashim, Strunk and Marsh, 2018, p. 254^[188]).

In some OECD review countries, private developers and public-private partnerships play an important role, complementing public investments into educational infrastructure. In light of imminent capacity shortages, the Flemish Community of Belgium launched an extensive public-private partnership based on the Design-Build-Finance-Maintain (DBFM) principle to construct more than 200 new schools, which is described in more detail in Box 3.11 (Leemans and von Ahlefeld, 2013^[189]). In the French Community of Belgium, an urgent action plan (*Modules et Rénovation-Création*) was launched in 2013 to create 15 186 new primary and secondary school places, investing 25 EUR million to construct new permanent and mobile schooling units (International Relations Directorate of the Federation Wallonia-Brussels, 2016, p. 76^[109]). In 2017, these investments were supplemented with more than EUR 100 million in private funding leveraged through DBFM schemes (Smoos, 2017^[177]). If well-managed, such public-private partnerships can attract private capital while ensuring that buildings remain under public control in the long run and private partners are committed to maintaining and improving school facilities. Similar approaches involving private commitments to the construction and long-term maintenance of school buildings have been used in Australia as part of the New Schools Project in New South Wales, in parts of Canada, and the United Kingdom (Patrinos, Barrera-Osorio and Guaqueta, 2009, p. 81 f.^[190]). In England, the Building Schools for the Future project was launched in 2003 with the aim to rebuild or refurbish all secondary schools by 2020. Following long delays, caused in part by an overly complex contracting process, a lack of clarity of goals and unclear accountabilities, the programme was discontinued in 2010 (James, 2011^[191]).

Box 3.11. Public-Private Partnerships (PPP) for school infrastructure investments in the Flemish Community of Belgium

In the face of demographic pressures and the need to expand its school network, the Flemish Community of Belgium has attracted private investment through Design-Build-Finance-Maintain (DBFM) schemes. With a total investment volume of EUR 1.5 billion, the public-private partnerships involve the construction of 200 new low-energy facilities, increasing the number of schools by more than 5%. Venture partners that invest in school buildings through the DBFM scheme agree to maintain them to an agreed standard for 30 years, while school boards pay them a leasing fee, partly subsidised by the public Agency for Educational Infrastructure (AGION).

At the end of the 30-year leasing period, ownership is transferred to the school boards without any additional costs. Following a public tender, Fortis Bank Belgium's Fortis Real Estate was selected to be AGION's private partner for all venture projects, which allowed constructions to benefit from economies of scale. The project's scope and its effectiveness in supplementing public resources with private equity to create sustainable facilities have rendered DBFM schemes a success, although capacity shortages continue to be a pressing issue in Belgium's metropolitan areas.

Source: Nusche, D., et al. (2015), OECD Reviews of School Resources: Flemish Community of Belgium 2015, OECD Publishing, Paris, <http://doi.org/10.1787/9789264247598-en>; International Relations Directorate of the Federation Wallonia-Brussels (2016), OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools: Country Background Report for the French Community of Belgium.

Since large-scale housing constructions generate increased demand for schooling, many countries expect developers to cover some of the associated capital costs. Leveraging contributions from housing developers can thereby help to ensure that the number of school places rises in line with student populations in expanding neighbourhoods. In England and Wales, for example, local authorities can charge developer contributions through Section 106 funding and the more recently introduced Community Infrastructure Levy (CIL) to meet infrastructural investment needs arising from new developments in their area (Local Government Association, 2014^[192]). With few exceptions, CIL contributions are levied on all new developments in the form of a non-negotiable fixed-rate tax and can be used to fund any type of public infrastructure, such as roads, parks, hospitals or schools.

Depending on their design, development fees – as are common in many US states – may be better suited to serving expanding suburban areas than high-density neighbourhoods with little new housing construction, even though they may experience a similar shortage in school places (Vincent, 2006^[187]). Particularly where developer contributions are subject to site-by-site negotiations, rather than mandatory and transparently calculated parameters, local authorities may also lack long-term planning certainty and the capacity or power to enter mutually satisfactory agreements. Some communities in the United Kingdom, for example, have reported difficulties when trying to negotiate developer fees in times of economic downturns and raised concerns that they might inhibit investment in affordable housing (Local Government Association, 2014^[192]). The newly introduced CIL aimed to mitigate some of these problems with a tariff based approach that allowed the tax to be levied more efficiently and fairly on all new developments, rather than just a few larger-scale schemes, and gave both local authorities and developers more planning certainty. In addition, local authorities did not need to invest contributions where they were collected, which gave them greater flexibility to

channel resources to the places that needed them the most. To encourage the construction of affordable housing, they were excluded from obligatory contributions.

Integrated multi-sector responses to student segregation

Educational segregation is the product of a complex interplay between residential segregating and different selection dynamics involving both parents and schools. While there may not be a silver bullet to avoid school segregation, a set of co-ordinated interventions spanning multiple policy sectors can attenuate the concentration of educational disadvantage and foster diversity in schools. Some of these strategies seek to reduce housing segregation as one of the main drivers of school segregation. Within the education sector, three sets of strategies have been distinguished: First, direct interventions into the distribution of students and school places. Second, “controlled choice” schemes that regulate the parameters of parental choice. Third, school improvement strategies that seek to promote a more balanced distribution of students by targeting support at the most disadvantaged schools and thereby raise their attractiveness (Karsten, 2010^[156]).

Direct interventions into the distribution of students

In countries operating mandatory student assignment systems, several strategies can be used to increase diversity in schools and counteract the impact of segregated housing. Direct interventions into the distribution of students have been relatively rare among OECD countries. The most prominent examples are known from the United States, where court orders in many school districts advanced the desegregation process by mandating “non-white” children from the poorest neighbourhoods to be “bussed” to predominantly “white” schools in more prosperous districts (Karsten, 2010^[156]). Yet, there are other examples of assignment policies aimed at creating a more balanced distribution of students across the school network. These include the adjustment of catchment areas, e.g. integrating affluent and disadvantaged neighbourhoods into one district; the strategic planning of new schools to serve mixed student populations; magnet schools that recruit students and families to attend specialised schools in diverse neighbourhoods; and different forms of student transfer policies (Karsten, 2010^[156]) (see Chapter 2 for a more detailed discussion).

The Danish capital city Copenhagen has sought to tackle the consequences of residential segregation and “native flight” with an ambitious initiative incorporating some of these elements starting in 2006. As part of its “Copenhagen Model for Integration”, the city implemented a series of measures including an extensive bussing scheme to more evenly distribute immigrant and native students across the city’s public schools (see Box 3.12) (OECD, 2009^[193]; Nusche, 2009^[194]; Open Society Foundations, 2011^[195]; Houlberg et al., 2016^[196]).

Box 3.12. Reducing segregation through student transfers and transport in Copenhagen

Following a pilot phase in 2006, the City of Copenhagen rolled out a series of initiatives as part of its “Improved Learning for All” (*Faglighed for alle*) programme. Its aim was to reduce the high degree of ethnic segregation among the city’s public schools by providing incentives for ethnic minority students to choose mostly native schools, and *vice versa*. The initiative addressed both immigrant students, who tended to be highly concentrated in some neighbourhoods, and native students, many of whom exercised school choice to withdraw from public schools with a high proportion of immigrants.

To increase diversity in predominantly native neighbourhoods, schools reserved a certain number of places for bilingual students from catchment areas with a high concentration of immigrants, who were supported with free municipal bus transport in case they chose to enrol in a school outside their neighbourhood. Participating schools also trained their teachers in educating bilingual students and employed integration workers or translators of ethnic minority background to advance the integration of newly arrived immigrants.

At the same time, the programme involved multiple schools with large numbers of immigrant students in publicity campaigns to raise their attractiveness and deter “native flight”. This included mother tongue instruction, anti-discrimination initiatives and efforts to collaborate with local pre-schools to inform parents of the advantages of choosing their local public school over a private alternative or a school elsewhere.

According to an evaluation carried out by the city in 2010, the programme appears to have had a small but positive impact, resulting in a more balanced distribution of bilingual students across Copenhagen’s public schools, an improved perception of local public schools and a reduced achievement gap between immigrant and native students. Other cities, such as Aarhus, have adopted similar policies to encourage voluntary transfers among immigrant students.

Source: OECD (2009), *OECD Territorial Reviews: Copenhagen, Denmark 2009*, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264060036-en>; Nusche, D. (2009), “What Works in Migrant Education?: A Review of Evidence and Policy Options”, OECD Education Working Papers, No. 22, OECD Publishing, Paris. <http://dx.doi.org/10.1787/227131784531>; Open Society Foundations (2011), *At Home in Europe: Muslims in Denmark*, Open Society Foundation: Budapest.

Other strategies aim to re-balance the distribution of students in segregated school systems by providing socio-economically advantaged or ethnic majority students with incentives to attend schools with diverse student populations. In the United States, some “magnet schools” have been explicitly designed as desegregation tools since the 1970s. Located in relatively disadvantaged areas, they sought to attract students from other neighbourhoods with specialised math, science or art curricula and a high-quality education in an integrated learning environment. Students attending such magnet schools outside their catchment areas are usually provided with free school transport (Nusche, 2009^[194]).

Regulating school choice and selection to reduce student segregation

As discussed in Chapter 2, the process by which students are allocated to schools has a significant impact on the degree of school segregation. The modalities of parental choice and residence-based assignment matter particularly in dense school networks where most students have multiple schools within their reach. Although they are frequently intended to reduce the impact of residential segregation on educational opportunities, school choice schemes that lack carefully designed checks and balances have sometimes reproduced, if not exacerbated segregation in the school network due to differential parental preferences and decision-making behaviour (see Chapter 2 for a more detailed discussion).

Public and school transport systems are another factor moderating the link between residential segregation and diversity in schools. Weakly developed or prohibitively costly transport networks can limit the extent to which lower-income families benefit from school choice while effective school transport arrangements can ensure that all students are sufficiently mobile to benefit from the expansion of parental choice. Pioneered in the United States to overcome the legacy of racial segregation in the 1950s, bussing schemes have since been used in multiple countries with the explicit aim to achieve a more socially balanced distribution of students across the school network and reduce the impact of residential segregation (Brunello and De Paola, 2017^[197]).

Using integrated improvement strategies for schools across the performance spectrum

One of the most troubling consequences of segregation in urban areas is the concentration of high-needs students, which places a disproportionate burden on some schools in the network if they fail to receive adequate support. Given that demographic trends and entrenched segregation in many inner-city districts limit policy makers' ability to raise schools' socio-economic and ethnic diversity, some cities have shifted their attention towards making schools with a high concentration of disadvantaged students as effective as possible (Karsten, 2010^[156]). Alongside approaches such as weighted funding formulas and teacher mobility schemes (OECD, 2017^[27]), integrated school improvement strategies seek to address the complex needs of schools with widely diverging levels of performance and capacity.

One example of integrated improvement plans that co-ordinate targeted support for schools across the performance spectrum is the London Challenge, which was implemented in the United Kingdom's capital between 2003 and 2008 and subsequently expanded to other regions as the City Challenge until 2011 (see Box 3.13) (Nusche et al., 2016, p. 167^[72]). Other initiatives seeking to raise the quality of schools with high proportions of migrant students include Switzerland's Quality in Multi-Ethnic Schools (QUIMS) programme. In a context where growing numbers of native middle class families left inner-city districts with ethnically diverse populations, Swiss authorities responded with an area-wide model of quality assurance to improve educational provisions for students from migrant backgrounds and reverse the trend of segregation by increasing the attractiveness of multi-ethnic schools. To achieve these goals, the programme provided additional resources and professional support to schools with 40% or more students from migrant backgrounds (Nusche, 2009^[194]).

Box 3.13. The London Challenge and City Challenge

In England (United Kingdom), the Department for Education and Skills launched the London Challenge to improve education in the capital. While the programme initially focused on supporting secondary schools in London between 2003 and 2008, it was expanded as the “City Challenge” to include primary schools in two additional areas – Greater Manchester and the Black Country – between 2008 and 2011.

Building on the experience of its predecessor, the City Challenge pursued three objectives: to reduce the number of underperforming schools; to increase the number of good and outstanding schools; and to improve educational outcomes for disadvantaged children. The programme included a number of elements aimed at schools across the performance spectrum: identifying the underperforming schools that would require the most support (“Keys to Success”); supporting satisfactory schools in becoming outstanding through targeted interventions; support schools in narrowing attainment gaps between disadvantaged students and their peers; providing schools with data about their intake; grouping schools into so-called “Families of Schools” and encouraging them to work together; building the capacity of local authorities; implementing leadership development strategies led by the National College for School Leadership; in addition to various local interventions. The programme did not promote a single view of what schools needed to do to improve. Instead, all interventions were based on local decisions involving key stakeholders, including school principals and local authority officials.

An evaluation of the City Challenge positively highlighted that the proposed strategies for school improvement included different forms of support, depending on the schools’ performance and reinforced the notion that all schools should strive to improve their provision (Hutchings et al., 2012^[198]). Inadequate and underperforming schools benefited from experts’ support. Satisfactory schools worked with two or three other schools with similar intakes, led by the principal of a school that was further along its school improvement process. Good and outstanding schools benefited from a wide range of opportunities to share their practices and learn from the experience of other successful schools, while also supporting weaker schools.

Source: Baars, S. et al. (2014), *Lessons from London Schools: Investigating the Success*, <http://centreforlondon.org/publication/lessons-london-schools>; Kidson, M. and E. Norris (2014), *Implementing the London Challenge*, <https://www.instituteforgovernment.org.uk/sites/default/files/publication/Implementing%20the%20London%20Challenge%20-%20final%200.pdf>; Hutchings, M. et al. (2012), *Evaluation of the City Challenge Programme*, www.gov.uk/government/publications/evaluation-of-the-city-challenge-programme.

Supporting students’ access to high-quality schools through concomitant housing policies

Although school improvement, the regulation of school choice systems, and incentives for schools to enrol more diverse cohorts are important levers to reduce student segregation and address its consequences, residential segregation exerts a pervasive influence on the distribution of students across the school network. Ensuring that cities’ rich educational offer benefits all of their residents therefore requires a broader strategy that includes concomitant approaches across multiple policy sectors including housing and public transport. Policies designed to increase the availability of affordable housing

in high-quality school districts or expand the residential mobility of minority and low-income families can expand access to neighbourhoods that meet both their residential and educational expectations (Rhodes and Warkentien, 2017^[199]).

Authorities at the national and the local level can have a critical influence on the supply and demand for affordable housing. Policies such as inclusionary zoning and housing allowances, which aim to make quality housing available to all segments of the population, are not only an important step towards more mixed neighbourhoods and lower school segregation – they are also considered a primary lever for inclusive economic growth in cities (OECD, 2016, p. 121^[129]). Income-dependent housing allowances, usually centrally provided in the form of cash subsidies or vouchers, can help to promote mixed-income urban neighbourhoods and encourage residential mobility. Recent evidence also suggests that well-implemented allowances yield significant benefits for young children’s long-term educational trajectories. For example, evaluations of the Moving to Opportunities (MTO) experiment, conducted by the US Department of Housing and Urban Development, show that children who benefited from the programme under the age of 13 were more likely to attend college and went on to have higher earnings as adults (Chetty, Hendren and Katz, 2016^[166]).

At the city-level, inclusionary zoning policies can be an effective supply-side instrument to reduce segregation and increase the availability of affordable housing, for example by requiring new developments to contain a specified share of affordable housing units, sometimes in exchange for financial or regulatory concessions. This can encourage the inclusion of low-income households in otherwise market-rate residential areas and avoid the spatially concentrated supply of low-income housing that sometimes resulted from traditional social housing schemes. Originating primarily in the United States, inclusionary zoning practices have since been adopted in a number of other countries (OECD, 2016, p. 125^[129]).

If housing policies at the national and local levels are misaligned, they can cancel each other out, resulting in a sub-optimal use of resources and the erosion of their social and economic impact. Common examples of such conflicting approaches include the imposition of demand-side constraints on the housing supply at the local level (e.g. through land-use regulations, development controls and zoning requirements), and simultaneous efforts to stimulate supply at the national level (e.g. through spending on new housing construction or facilitated access to home ownership through regulatory tools and tax incentives). To prevent housing policies at different levels of government from undercutting one another, it is important to address the causes of co-ordination weaknesses and ensure that policies across levels are aligned (OECD, 2016, p. 121^[129]).

Social rental housing provided at sub-market prices and allocated according to specific criteria, is commonly used to increase access to affordable housing for low-income individuals. In systems with decentralised responsibilities for the provision of social housing, municipalities with a high share of low-income households may not have the financial and organisational capacity to maintain an adequate supply of social housing. In addition, the construction of large social housing estates, disconnected from existing street networks, has occasionally aggravated segregation and exclusion by concentrating disadvantaged households in neighbourhoods with low-quality public services and limited access to job opportunities. Creating inclusive cities therefore requires a holistic urban planning approach that addresses issues related to education, employment, culture, safety, urban services and social cohesion while carefully considering the indirect consequences of policy decisions over the long term (OECD, 2016^[129]).

3.7. Policy options

Consider a range of strategies to enhance the efficiency of school networks with excess capacities in the light of contextual constraints and students' educational needs

Demographic shifts, regional economic developments and changing student needs have exposed many school systems to costly mismatches between educational demand and supply in both rural and urban areas. Adjusting the school network in response to these challenges and realising its potential for synergies has therefore become a central aim for school systems seeking to enhance their efficiency and free up resources to improve student outcomes. In order to do so, policy makers should consider the full spectrum of strategies to rationalise the organisation of the school network, which includes re-thinking how educational services are defined and distributed across school sites, fostering co-operation and resource sharing between providers, creating school clusters and engaging in consolidation.

Adopt a modular approach, allowing for flexibility in the way grade levels are distributed across school sites

Encouraging a “modular” approach to the school network and educational offer can expand the repertoire of flexible strategies to advance their efficient organisation. This entails shifting the focus away from schools as entire institutions towards the individual services they offer and re-evaluating whether there is room for improving the way they are distributed across school sites. Allowing for some flexibility in the combination of different grade levels within the same institutions can make it easier to adapt the school network in response to changing levels of demand, particularly if contextual developments generate different pressures across levels of education. Promoting these modular approaches should also involve a reflection on which levels of education can be adequately offered at the local level and which ones should rather be provided at a larger scale.

Promote resource sharing and school clusters to address efficiency concerns in fragmented networks

In many cases, encouraging small schools to co-ordinate their educational offer, share resources or consolidate their administrations can allow school networks to significantly enhance their efficiency without fundamentally intervening in the number, size or location of its schools. Besides the economic savings generated through economies of scale, resource sharing and collaboration can also improve small schools' capacity to provide a broad curriculum and high-quality instruction. This can be achieved, for example, by sharing teaching equipment or entering joint purchasing agreements, by jointly offering courses or easing the recruitment and retention of high-quality teachers by providing them with better development opportunities and a larger professional community.

Co-operation between schools can take different forms with varying degrees of formality, duration and scope. School clusters and federations, for example, which consolidate the administration of multiple school sites, should be considered as an effective means to counteract some of the disadvantages of small schools without requiring their removal from the local community. In light of its complexity, the successful introduction of a centralised leadership team and budget for multi-site schools requires careful attention to

building the capacity for pedagogical and administrative leadership, and possibly the development of middle and distributed leadership structures.

To leverage innovative approaches to the design and delivery of services in rural communities, authorities should also identify and reduce barriers or disincentives that impede schools from engaging in voluntary collaboration and resource sharing. Depending on an assessment of the obstacles to co-operation, promoting efficient collaboration can also involve strengthening local capacity, regional planning platforms and steering the process through regulatory instruments or incentives.

Advance school consolidation by carefully combining incentives and direct support if there is a strong economic and pedagogical case

Despite the great potential of resource sharing and inter-school collaboration, systems with a fragmented school network that exhibits significant inefficiencies should complement these approaches with incentives for the consolidation of small schools. This practice involving the closure of some schools and the transfer of its students to a proximate site can yield long-term cost savings by increasing the average size of schools and lower per-student fixed costs. When considering the consolidation of school networks, authorities should take great care to weigh its economic benefits against the substantial transition costs generated during the process, the public and private expenditure arising from longer commuting distances, and the social and economic impact on surrounding communities.

As reiterated below, any consolidation project must also, first and foremost, yield tangible pedagogical benefits for the students it concerns. Larger, better resourced schools may offer their students greater curricular diversity, specialised teachers and support services, better equipment, facilities and activities as well as the ability to organise all instruction in single-grade settings. Yet, the increased distance from students' homes and the short-term disruptive experience of relocating to a new school can negatively impact students' well-being and learning outcomes. To attenuate these effects, authorities need to ensure that the transition process is as smooth as possible and students are well-integrated in their new environments. Policy makers should also acknowledge that some constraints, such as the geographic isolation of some rural communities, may render consolidation impossible and that, particularly for younger children, maintaining access to schools at a reasonable distance from home should remain a priority.

Authorities that decide to pursue consolidation should consider a combination of policy levers, including financial incentives and direct support in the school closure process. Incentives for consolidation, for example in the form of per capita funding through a central formula, can constitute a powerful steering tool that discourages the maintenance of small schools due to their relatively high per-student fixed costs. These measures should be carefully targeted at the educational levels and sectors in which consolidation is expected to yield the greatest benefit, and include safeguards for schools that can or should not be subject to closure. Direct aid can help consolidating districts in stemming the associated transition cost. As discussed in Chapter 2, consolidation can also be encouraged through policy levers aimed at the adjustment of governance arrangements, for example by increasing the size of catchment areas and financially autonomous administrative districts. Imposing universal rules concerning, for example, minimum class and school sizes that leave local actors with little room for manoeuvre risks to overlook the importance of local context for the efficient organisation of the school network and the feasibility of consolidation. In general, authorities should be careful to

provide clear incentives, avoid sending contradictory signals and select steering tools that reinforce, rather than undermine or offset each other.

Address concerns for local development and develop strategies to use facilities effectively beyond the point of consolidation

School closures may have short- and longer-term ramifications for the local community and neighbouring areas, which need to be taken into consideration when planning to restructure the school network. Particularly the closure of schools frequently raises concerns that it may accelerate the demographic and economic decline, particularly in rural communities. Even though the consolidation of schools is more frequently a symptom than a cause of a community's decline, fears that any efficiency gains stemming from consolidation could be offset by reduced economic activity, lower tax revenue and declining property values need to be taken seriously. While decisions on the future of small, rural schools should be based on what is in the best interest of their students rather than their value for local and regional development, authorities should think of alternative ways to sustain the social benefits that schools provide where consolidation is seen as economically unavoidable or pedagogically prudent.

This should involve supporting local institutions in taking over any essential functions that the school may have provided in addition to its educational services, as well as a broader reflection on economic strategies and funding solutions to support rural development beyond the field of education. Developing plans for the future use of consolidated school facilities in close collaboration with local stakeholders is another important part of the post-consolidation process. Doing so is not only central to materialising the prospective efficiency gains of consolidation, but also to pre-empt local stakeholders' concerns and offset some of the negative side-effects the consolidating community may experience.

Compensate for efficiency, quality and equity challenges experienced by remote schools

In areas where network consolidation or increased co-operation between schools is unfeasible due to their geographic isolation or other reasons, a range of compensatory policies including targeted funding and the use of ICT can put them in a better position to provide their students with the high-quality education they deserve. Various forms of ICT-supported education, ranging from distance learning to students' participation in teacher-facilitated web-based lessons can ameliorate the limitations imposed by the narrow curriculum and personnel of small rural schools. Given the wide distribution of student outcomes in ICT-supported education, their successful introduction requires careful preparation, including the development and provision of appropriate electronic content, training teachers in rural schools, and ensuring sufficient network connectivity.

To compensate for efficiency challenges in parts of the school network, authorities should also ensure that the regulatory environment is transparent and flexible enough for schools to leverage the support of their community. Given that small schools, particularly in rural areas, are often embedded in tight-knit communities and considered to serve an important role in their social life, many of them have sought to leverage the support of parents, small businesses and other local actors to ameliorate their condition. Voluntary contributions and favourable collaborations, for example on maintenance works or the organisation of social events, can ease the financial burden of small schools and help to ensure their continued operation. To encourage community involvement, local authorities

should therefore create a constructive and permissible regulatory environment while at the same time monitoring community involvement to ensure that health and safety regulations are adhered to and public resources are spent effectively.

Where consolidation and other means to improve the efficient operation of the school network are not an option, authorities should consider providing struggling remote schools with targeted financial support. Since it is widely recognised that the provision of high-quality education in rural areas comes at a higher per-student cost, some countries provide dedicated funding to compensate for the greater resource needs of small, isolated schools and their difficulty to recruit high-quality teachers. In addition, targeted programmes have been used to finance teacher professional development and collaboration across isolated schools and transport arrangements where distance constitutes a significant barrier for teachers' mobility. Given the significant geographic heterogeneity in the supply of high-quality teachers, support for an adequate provision of initial teacher education and effective "grow your own" programmes can help to alleviate concerns about teacher shortages in rural settings.

Respond to capacity shortages in school networks strategically

Effectively meeting the rising demand for school places in high-density urban areas and networks with rising student numbers can be a major challenge. Increases in enrolment, whether caused by residential development, increased birth rates or changing patterns of migration, may be long-lasting or short-lived and appear with varying degrees of predictability. Initiating new constructions in response to momentary spikes in enrolment can render buildings obsolete long the investment has paid off. Conversely, short-term solutions such as the intensified use of existing buildings or temporary facilities are unlikely to be efficient and beneficial for student learning in the long run if the level of enrolment remains high. Countries should therefore cultivate strategic foresight and the capacity to distinguish long-term enrolment trends from short-term fluctuations to ensure that the school network's capacity grows in line with increased long-term demand. This may include providing the responsible authorities with the analytical tools and capacity to identify areas of heightened demographic pressure and the sites where new school constructions would most effectively alleviate overcrowding or cater to expected population growth.

Modifying the school networks' existing infrastructure can enhance their efficiency and generate additional capacity where increases in student enrolment are expected to be temporary or occur too rapidly for new constructions to offer sufficient relief. Contingency plans and guidance materials should be used to help schools and local authorities in weighing the pros and cons of different ways to adjust their facilities in these scenarios. As an immediate and minimally invasive remedy, remaining capacities in oversubscribed school networks should be identified and put to use by re-directing students or advising schools how to use their space more efficiently. In exceptional circumstances, relaxing maximum class size rules for a limited period of time can also be an effective way to accommodate temporary spikes in demand.

The use of prefabricated mobile classrooms can be another effective short to medium-term response to capacity shortages where insufficient time or capital funding rules out the construction of new facilities or student demand is expected to subside again. Temporary classrooms can add flexibility to the school network and attenuate the negative impact of acute overcrowding but high standards should ensure that they not only guarantee the students' health and safety but also provide them with a high-quality

learning environment. Since mobile classrooms are unlikely to be as economically efficient or conducive to student learning as permanent facilities in the long run, their period of use should remain limited.

In contexts where the demand for school places is expected to rise and remain high, whether due to demographic shifts or policy changes, authorities need to ensure that the school network expands its provision of high-quality facilities in line with educational demand. Where new demand is generated by housing development, instruments like developer fees that link capital funding to residential construction projects, can be an effective way to share the burden for infrastructural investments. However, authorities should avoid an overreliance on locally restricted developer contributions and acknowledge that high-density areas with little new construction activity may also experience rising demand for school places. Likewise, countries in which developer contributions are subject to site-by-site negotiations rather than calculations based on uniform criteria, local authorities should be given sufficient long-term planning certainty and the capacity to reach satisfactory agreements without having to compromise on the construction of affordable housing, particularly in times of economic downturn.

Take a multi-sector approach to reduce segregation and ensure that all students benefit from the rich offer of urban school networks

A high density of schools and students can enable cities to provide a rich educational offer and extensive choice. However, due to residential patterns and differential school choice behaviour, not all students benefit from these opportunities to the same extent. The schools of many cities are academically stratified and segregated along the lines of students' economic and socio-demographic characteristics. These patterns have a tendency to become entrenched and risk depriving students of the chance to live up to their full potential. Since the factors that contribute to segregation dynamics are context dependent, authorities should investigate them carefully before rigorously piloting and rolling out an appropriate combination of measures across policy domains, including education, transport and housing.

The position of new schools can exacerbate or attenuate the effect of residential segregation on students' educational opportunities. Newly opened schools should be encouraged to serve areas with diverse student populations, accompanied by information campaigns or specialised offers to encourage their attendance, particularly where parents are at risk of transferring their children to the private sector. Policies related to student assignment mechanisms and parental choice also mediate the educational consequences of residential segregation. Although they are often intended to widen access to high-quality education, school choice schemes risk to limit rather than expand opportunities for disadvantaged students due to differential parental preferences and behaviour. To avoid this, all parents should be supported in taking full advantage of their educational opportunities and carefully designed checks and balances need to ensure that the submission of school preferences and admissions criteria support a diverse student intake (see Chapter 2). In systems that rely on the geographic assignment of students to local schools, authorities should seek to define catchment areas that integrate affluent and disadvantaged neighbourhoods where possible, while keeping students' distance from their school reasonably short.

Sustainable efforts to prevent the marginalisation of disadvantaged students in highly segregated school systems need to be aligned with concomitant housing and public transport policies. To reduce residential segregation, authorities should consider both

supply-side instruments, such as inclusionary zoning, and demand-side tools like income-dependent housing allowances to promote residential mobility, increase the availability of affordable housing and foster mixed-income urban neighbourhoods. Housing policies at the national and local levels should be co-ordinated to prevent them from undercutting one another, which could result in a sub-optimal allocation of resources and the erosion of their social and economic objectives. Likewise, authorities should carefully monitor the effects of restrictive zoning, lot size regulations and other policies known to encourage the spatial concentration of social housing and take preventative measures where segregation is a concern.

Finally, the mutual reinforcement of residential and school segregation should be acknowledged and addressed to prevent the displacement of disadvantaged families from areas with high-quality schooling. Local funding mechanisms, including the relative importance of locally raised taxes for school investments, play an important role in mediating this relationship and should be scrutinised with a view to reduce geographic inequities. Likewise, initiatives aimed at narrowing the gap between high-performing and low-performing schools can be effective in raising the quality of the most disadvantaged schools while preventing the exodus of advantaged families from underperforming school districts. Among the promising avenues in this regard are integrated school improvement plans that provide tailored support for schools across the performance spectrum and encourage them to learn from one another.

Make educational quality, equity and student well-being the guiding principles for network reforms

Regardless of whether increased efficiency of the school network is pursued through school collaboration, consolidation or the expansion of capacity, advancing educational quality, equity and student well-being should be the guiding principle for any network reforms. To put this ambition into practice, responsible authorities can consider a set of policy options aimed at rendering network reforms more effective and sensitive to students' needs. The basis for any of these efforts is taking a systematic approach to monitoring ongoing network reforms and evaluating their effect on students and families. While authorities should also draw on international best practices for network reforms and the experience of comparable projects elsewhere, generating and sharing evaluation results among national stakeholders at the sub-system level is an equally crucial step towards system-wide learning and generating reliable insights into its effects on students.

Ensure stakeholders are consulted and engaged in the process

As with any major reform project, the reorganisation of school networks should be preceded by the systematic consultation and engagement of stakeholders. Structured consultation procedures bringing together all major stakeholders, including less powerful and active voices, can be an effective means to resolve conflicts before they arise, to hold authorities to account and find implementation strategies suitable to the local community's needs. The consultation and engagement leading up to reforms is crucial to ensure that stakeholders have adequate knowledge of educational policy goals, the ownership and willingness to effect change, and the tools to implement a reform as planned. Authorities should contribute to this process by maintaining a high level of transparency, articulating a clear vision for the school network reform, demonstrating that potential alternatives and their likely effects on students and the local community have been considered and providing a strong case that the plan will bring about tangible improvements in educational quality. Central guidance on when and how to conduct

consultation procedures can be an effective means to support local authorities and align expectations among all actors involved.

Identify and address equity concerns

For school network reforms to benefit students of all backgrounds and needs, it is essential for authorities to identify their potential impact on equity and the well-being of specific student groups well in advance and take the necessary steps to address them. Just as current inefficiencies in the school networks can place some students at a systematic disadvantage based on their location, resources or educational needs, restructuring the network can have a harmful impact on specific student groups and exacerbate existing inequities. Equity concerns should therefore receive particular attention in the institutional frameworks for effective network design and planning. As well as raising awareness among the responsible authorities, countries should take active steps to guarantee that these concerns are addressed, for example by ensuring that representatives of vulnerable groups are involved at key stages of the proposed reforms' design and implementation.

Ensure effective arrangements for school transport

Effective arrangements for students' transport to and from school or afternoon activities are central to guarantee their access to high-quality education. They are particularly crucial for the successful relocation of students affected by consolidation and to alleviate uncertainties among families and other stakeholders leading up to the closure of schools. Authorities should therefore provide clear and transparent frameworks that specify the conditions under which students have a right to school transport. The criteria used to determine students' eligibility for transport should be responsive to students' and families' needs. Besides the distance from the nearest school, these criteria could include the students' age or level of education, the availability of public transport options and the reliance on arrangements for special needs students.

Authorities should also align the responsibilities for setting up, operating and funding transport systems in case of school closures with their policy priorities for the organisation of the school network. Assigning responsibilities for the funding of student transport to the authorities responsible for managing the school network, for example, can ensure that the economic benefits and drawback of school closures are accounted for in their entirety before enacting consolidation plans, provided that the authorities manage a sufficiently large school network.

In denser school networks with some degree of parental choice, the means-tested provision of transport options also plays an important role in promoting equity and overcoming spatial segregation by enabling disadvantaged students to consider a wider range of schools beyond their immediate community. Weakly developed or prohibitively costly transport networks in urban areas may limit the extent to which lower-income families can benefit from educational opportunities that suit their children's needs. Authorities should therefore facilitate students' mobility between neighbourhoods as well as peripheral and central areas and monitor whether current transport provisions are effective in enhancing the mobility of disadvantaged families.

Notes

¹ Authors' analysis based on TALIS 2013 data.

² Authors' analysis based on PISA 2015 data. The analysis is limited to OECD countries with at least 100 sampled students in both levels of education. Differences may be partially explained by the fact that 15-year-old students in rural schools are more likely to have repeated a grade, and therefore to be in lower secondary education.

³ Authors' analysis based on PISA 2015 data.

⁴ Authors' analysis based on TALIS 2013 data.

⁵ Authors' analysis based on PISA 2015 data.

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Annex 3.A. Supplementary material

Annex Table 3.A.1. Public support for school transport, ISCED 1-3, 2016

	Authority responsible for school transport		Parental contributions (if eligible)	Eligibility criteria for school transport provision					Regular public transport discounts (3)
	Funding	Organisation		Distance (km)	Distance (other) (1)	Means-based	SEN	Other (2)	
Austria	Central	Central	Yes	✓				Lack of public transport	✓
Belgium (Fl.)	State	State	Yes	✓	✓		✓		✓
Belgium (Fr.)	State	State	Yes		✓		✓		✓
Chile	Central	Central	No			✓	✓	School's rurality index	✓
Czech Republic	Regional	Regional	Yes	✓					✓
Denmark	Local	Local	Depends	✓		✓		Age, school type, immigrant background	
Estonia	Central	Local and school	Depends			✓	✓	School type	✓
Iceland	Central and local	Local	No	✓					
Kazakhstan	Local	Local	No		✓				
Lithuania	Central	Central and local	No	✓		✓	✓		✓
Slovak Republic	Central	Regional	No		✓		✓		
Slovenia	Central	Local	..	✓ (ISCED 1/2)		✓ (ISCED 3)	✓	Wildlife threats	✓
Spain	Central and regional	Regional	..		✓	✓	✓	Academic scholarships	
Sweden	Local	Central and Local	No	✓	✓		✓		
Uruguay	Central	x	No						✓

Note: The review team made every effort to ensure, in collaboration with countries, that the information collected through the qualitative survey on school funding is valid and reliable and reflects specific country contexts while being comparable across countries. However, given the qualitative nature of the survey, information should be interpreted with care.

For definitions of levels of education and levels of administration, see Annex A. For country-specific notes to this table, see the end of this annex.

x: not applicable

.. : missing information

1: Other distance-related criteria include travel times or the attendance of schools outside the municipality of residence.

2: Other criteria include the specific education level, age, or other municipality specific criteria rather than the ones already presented in the table.

3: Transport discounts include reduced prices for public transport and need not imply transport arrangements for students in specific schools.

Source: The information in this table was compiled based on information provided by the review countries through the Review's qualitative questionnaire on school funding and Country Background Reports (accessible at www.oecd.org/education/schoolresourcesreview.htm).

Country notes

Austria: School transport is free of charge for students using public transport, except for a small parental contribution (€ 19.60 per school year). Where no adequate public transport is available, municipalities and school providers can apply for special transport arrangements to be set up that are provided free of charge to students. In cases where more than two kilometres of a student's commute to school are covered by neither of the provisions above, students can receive additional support according to the length of their commute. The funds for school transport are administered by the Federal Minister within the Federal Chancellery for Women, Families and Youth (*Familienlastenausgleichsfonds*). Austrian authorities also provide accommodation and transport grants for students who can prove school success and attend a school outside their place of residence.

Belgium (Fl.): School children are offered discounts for the use of public transport. If primary school students cannot find a public or subsidised private school within a 4 km radius from their home, the Community is obliged to either contribute to the cost of transporting students to the nearest publicly funded school or expand its subsidies to include whichever non-funded school the students end up attending. Children with special educational needs can make use of free bus transport services provided by schools and funded by the government.

Belgium (Fr.): School children in the regions of Wallonia and Brussels are offered discounts for the use of public transport. The regions are mandated to extend the same transport support to all students attending public or subsidised private schools. In rural or remote areas, the responsible authorities can organise student pick-up systems to enable students to bridge the distance between their homes and the nearest schools. Children with special educational needs can make use of free bus transport services provided by schools and funded by the government.

Chile: The central government provides transport for students living in remote areas but close enough to attend a school using transport services. The Programme to Support the Rural School Transport System provides schools with a rurality index above 25% additional funding to pay for student transport, and rural schools offering boarding services receive an extra subsidy to pay for the students' accommodation and meals. In addition, the National Student Card allows students to use public transport at a lower price, for all students attending 5th to 12th grade in subsidised municipal and private schools, technical centres, professional institutes and universities.

Czech Republic: The regions are responsible for ensuring that transport is provided to and from students' catchment school if their permanent residence is located further than 4 km away. While families bear the cost of dedicated school transport services themselves, students benefit from discounts on public transport during school days. These discounts are financed through earmarked funding which the government has provided for public transport providers since 2004. As of 2018, students under the age of 26 receive a 75% discount.

Denmark: Municipalities have the legal obligation to subsidise transport costs for students living further than 2.5 km from their local Folkeskole. The extent to which transport costs are covered varies based on the students' age, the type of school they are enrolled in and its distance from their home. In order to advance equity objectives, some municipalities operate bussing schemes for students with an immigrant background from

districts and schools with a large number of immigrants (or students from a disadvantaged socio-economic background) to those with more students of non-immigrant background.

Estonia: The municipalities in which students reside are responsible for organising their school transport. In many cases, this involves free school bus rides or reimbursements and subsidies for public transport tickets. The national government also covers some of the cost of transport for students who commute from another municipality to attend one of the new state-run gymnasiums or public schools for children with special needs.

Iceland: School transport is fully funded by local communities, which receive funding from the central government based on the number of students and the distances between their homes and schools.

Kazakhstan: Where no school is available in the students' home village/rayon, transport to the nearest school is funded by the local budget. Funding does not cover transport to afternoon-courses or extracurricular activities.

Lithuania: Students in the country are entitled to subsidised public transport tickets, according to the Law on Reduced Transport Charges. Students in pre-school and general education residing in villages and towns farther than 3 km from the nearest school are entitled to transport to and from school organised by the municipality. The Lithuanian government is also implementing the “Yellow Bus programme” to improve transport conditions for students living in rural areas or students with special educational needs, and to ensure the safe transport of students who formerly attended consolidated schools or whose schools are re-organised to another school nearby.

Slovak Republic: Transport support is provided by the central budget and includes the payment of transport costs for students of basic schools and special basic schools completing their compulsory school attendance outside the place of their permanent residence within a defined school district. Regional authorities organise the students' transport to and from school, while the Ministry of Education reimburses parents for the cost incurred via the municipalities.

Slovenia: Public transport to school is funded for primary and lower secondary students living farther than 4 km from the nearest school. For upper secondary students the eligibility criterion is their household's level of income. The central government provides additional funds to support transport arrangements in municipalities that are the habitat of brown bears, where students might risk being attacked by bears and other wild animals. The transport of students with special educational needs is also funded if it is not guaranteed by the school.

Spain: Transport support is provided for students enrolled in compulsory education depending on their place of residence and their household's level of income. Families of children with special educational needs can receive additional social assistance and schooling benefits including transport support from the central government. The transport support for students with severe motor disabilities is up to 50% higher. This support depends on both household income and capital thresholds set by the administration.

Sweden: Each municipality is responsible for covering the cost of school transport for upper secondary students living farther than six kilometres from their school. This responsibility applies regardless of the schools' location and type of provision. However, the municipality's responsibility does not extend to organising the transport. The right to school transport means that the municipality is obliged to arrange free transport to school if necessary with regard to the length of the journey, traffic conditions, each student's











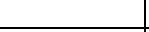
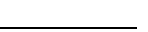




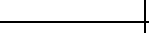
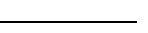




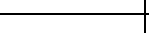
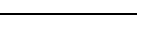
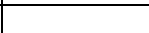
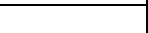

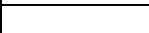
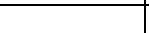
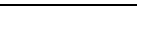






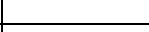

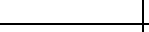


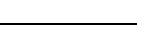
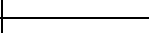

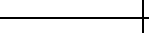



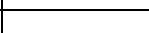

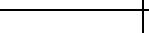



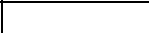

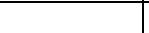


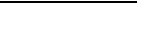





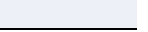
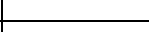
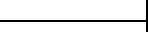
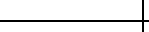


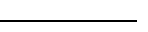
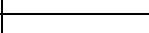

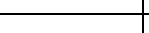


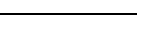
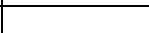

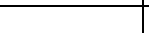
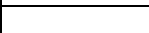

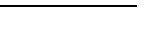






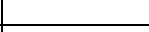
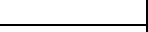
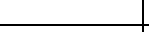



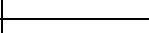
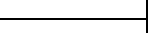
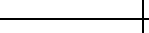


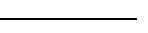
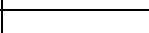
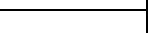
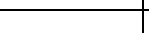
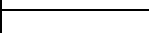

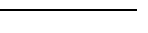
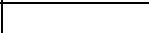
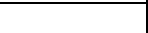

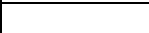

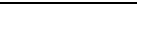
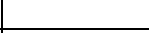
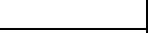
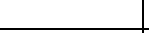
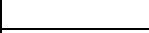


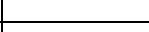
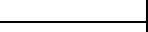
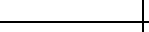
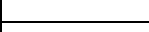


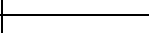





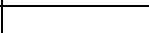











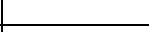
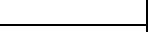

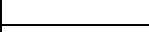


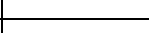
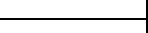

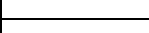

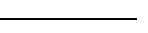
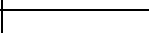

















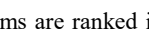
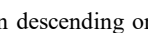
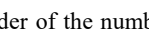
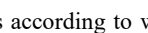
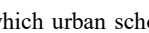

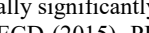
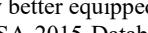
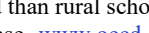

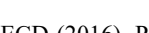

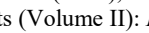
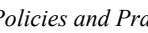
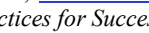

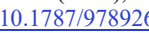

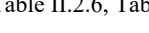
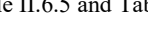
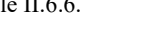















limitation or any other special circumstance. The right applies to students in compulsory education and students with special needs (including in upper secondary education), provided that the students attend the school to which the municipality has assigned them.

Uruguay: The central government funds free public transport for children attending primary school (public or private), free bus tickets for public secondary school students and student ticket subsidies for private secondary school students. For students in public lower secondary schools between 12 and 18 years of age and those of public upper secondary up to 20 years old, the government fully funds the cost of 50 monthly bus tickets. Transport is also provided for rural schools and a 2015 pilot project explored the use of transport services as a means to facilitate school consolidation in very low density areas, but the approach has not been pursued further due to resistance from parents and the local community (INEEd, 2015, p. 91^[118]).

Annex Table 3.A.2. Material resources in rural and urban schools

Results based on principals' and teachers' reports

 Urban schools better staffed than rural schools	 Rural schools better staffed than urban schools
 Too few observations	 No statistically significant difference

	Principals' concern about:			Science-specific resources	Computers per student	Proportion of computers connected to the internet
	Quantity of educational material	Quality of educational material	Quantity of physical infrastructure			
Mexico						
Australia						
Ireland						
Norway						
France						
United Kingdom						
Colombia						
Italy						
Lithuania						
OECD average						
Portugal						
Switzerland						
Turkey						
Austria						
Chile						
Czech Republic						
Finland						
Israel						
Slovak Republic						
Spain						
Sweden						
Estonia						
Germany						
Greece						
New Zealand						
Poland						
Slovenia						
United States						
Uruguay						
Canada						
Denmark						
Hungary						
Belgium						
Latvia						
Iceland						

Note: Systems are ranked in descending order of the number of variables according to which urban schools are statistically significantly better equipped than rural schools.

Sources: OECD (2015), PISA 2015 Database, www.oecd.org/pisa/data/2015database/; OECD (2016), PISA 2015 Results (Volume II): *Policies and Practices for Successful Schools*, <http://dx.doi.org/10.1787/9789264267510-en>, Table II.2.6, Table II.6.5 and Table II.6.6.

Annex Table 3.A.3. Teaching in rural and urban schools

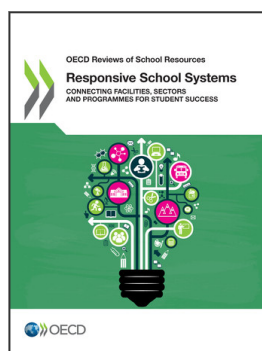
Urban schools better staffed than rural schools
 Rural schools better staffed than urban schools
 No statistically significant difference

	Principals' concern about:		Share of qualified science teachers (1)	Share of teachers participating in professional development	In-service training conducted by specialists
	Quantity of teaching staff	Quality of teaching staff			
Chile					
Estonia					
Iceland					
Norway					
Turkey					
Australia					
Canada					
Colombia					
Latvia					
Lithuania					
Mexico					
OECD average					
Slovak Republic					
Austria					
Belgium					
Czech Republic					
Denmark					
Finland					
Greece					
Ireland					
Israel					
New Zealand					
Poland					
Portugal					
Slovenia					
Spain					
Sweden					
Switzerland					
United States					
Uruguay					
France					
Germany					
Hungary					
Italy					
United Kingdom					

Note: Systems are ranked in descending order of the number of variables according to which urban schools are statistically significantly better staffed than rural schools.

1: Science teachers with a university degree and a major in science.

Sources: Authors' analysis, OECD (2015), PISA 2015 Database, www.oecd.org/pisa/data/2015database/; OECD (2016), *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools*, <http://dx.doi.org/10.1787/9789264267510-en>, Table II.2.10, Table II.6.18 and Table II.6.22.



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