Chapter 2. Governing the school network

This chapter describes the different actors involved in governing the school network, the roles and responsibilities they assume in different OECD and partner countries, and how their relationships affect the school network's capacity to meet demand for high-quality education. The chapter maps out steering and co-ordination mechanisms that can facilitate the strategic planning of school networks at the central as well as the regional and local levels. It also analyses challenges in aligning the development of the school network with infrastructural funding mechanisms. The chapter concludes by exploring a range of policy options to enhance the effective governance of school networks across levels of government.

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.

While the notion of the "school network" has in some contexts been used to denote specific school sectors and informal or formal associations of schools, this report uses the term to describe the entirety of school facilities through which education is provided in a given system (unless otherwise noted). In this context, governance therefore primarily concerns who makes, implements and monitors the decisions that affect the organisation of the school network and the basis upon which these decisions are made. This chapter describes the different actors involved in governing the school network, the roles and responsibilities they assume in different OECD and partner countries, and how their relationships affect the school network's capacity to meet demand for a high-quality education. In particular, the chapter considers i) the distribution of responsibilities in the governance of the school network, ii) how the strategic planning of school networks can be facilitated through central-level steering, iii) strategies to improve it through regional and local co-ordination and iv) how the strategic governance of the school network can be aligned with infrastructural funding mechanisms. Annex Table 2.A.1 includes relevant data on the distribution of capital expenditure from the OECD review's qualitative survey.

2.1. Distribution of responsibilities for the governance of school networks

Over the last decades, OECD school systems have grown in administrative complexity and are increasingly characterised by governance arrangements involving multi-level decision-making processes in which the links between actors operating at different levels are fluid and open to negotiation (Burns and Köster, 2016[1]). In addition, many OECD countries have undergone a process of decentralisation, increased school autonomy, and placed greater emphasis on market mechanisms and incentive schemes. These trends provide the context in which modern education systems have sought to distribute decision-making responsibilities and define relationships between different actors in the school system so as to render the governance of the school network more efficient and effective.

The developments mentioned above have taken place to varying extent across OECD countries. This is partly due to their different points of departure since some of them have a long-standing culture of devolution while others have historically been characterised by a high degree of centralisation. Federal countries such as Australia, Austria, Canada, Germany and the United States, have a long history of decision-making powers being shared between central and state levels. In others, such as Belgium and the Netherlands, the organisation of the school network is shaped by a strong tradition of school choice and the public funding of private education. A historically high degree of devolution in Finland and the United Kingdom also means that the local level has played an important role in schooling decisions for a long time (Burns and Köster, 2016[1]; OECD, 2017[2]). It is important to bear in mind these different institutional traditions to understand both the present organisation of school networks and the context in which the future development of their governance arrangements are likely to take place (OECD, 2017[2]).

Even where measures to adapt the school network are widely supported among stakeholders, complex governance arrangements can make it difficult to enhance its resource efficiency. Two of the key political and administrative challenges in addressing this issue are to reflect on the adequate distribution of network governance responsibilities between central, regional and local authorities as well as the division of responsibilities for different parts of the school network. The appropriate distribution of

these responsibilities depends on the wider governance context and, as will be further discussed below, there are many ways in which responsibilities can be effectively shared between actors at different administrative levels. Improving the arrangements for school network governance promises a more efficient use of school infrastructure. It also plays a role in reinforcing trust and promoting functioning relationships across levels and actors, in aligning curriculum and pedagogical approaches and in setting clear goals that guide students through their educational pathways, which is particularly important where student mobility is an issue.

Central, regional and local responsibilities for the governance of the school network and distribution of programmes

While there has been a general trend towards greater decentralisation in school systems over the past decades, the degree of local autonomy varies considerably across countries and domains of decision making. Compared with the organisation of instruction, for example, responsibilities for the governance of the school network and distribution of programmes across school sites tend to rest with more centralised tiers of government. Between 2003 and 2011, the proportion of decisions related to these matters that were taken at the central and state level has actually slightly increased while the proportion taken at the local and school level has dropped (OECD, 2012, p. 510; Table D6.6c[3]).

Some of the most consequential decisions affecting the organisation of the school network concern the creation of new schools and the closure of existing ones. As can be seen in Table 2.1, in 2011, the authority over the creation and closure of public lower secondary schools lay with central or state authorities in 14 OECD school systems. In half of these, the decisions were taken in full autonomy while the others let central authorities take their decisions after consulting with school, local or regional actors. Of the remaining countries, 16 assigned responsibility for the opening and closure of schools to local authorities. However, in only six systems did local authorities take these decisions autonomously, while the majority of them operated within frameworks set by higher level authorities (usually the state or central level) (OECD, 2012, pp. 505, Table D6.9.[3]).

Table 2.1. Responsibility for the opening and closure of public lower secondary schools, 2011

Country	Level taking the decision	Decision mode
Greece	Central	After consultation with regional level
Ireland	Central	After consultation with school level
Israel	Central	After consultation with local level
Luxembourg	Central	In full autonomy
Netherlands	Central	In full autonomy
Portugal (1)	Central	After consultation with local level
Slovak Republic	Central	After consultation with local level
Australia	State	After consultation with state and local level
Austria	State	After consultation with state and local level
Belgium (Fr.)	State	In full autonomy
Canada	State	In full autonomy
Mexico	State	In full autonomy
Spain	State	In full autonomy
Switzerland	State	After consultation with local level
Italy	Regional	Within framework set by central level
Korea	Regional	In full autonomy
Turkey	Regional	Within framework set by central level
France	Sub-regional	Other
Chile	Local	Within framework set by central level
Czech Republic	Local	Within framework set by regional level
Denmark	Local	Within framework set by central level
England	Local	In full autonomy
Estonia	Local	Within framework set by central level
Finland	Local	In full autonomy
Germany	Local	After consultation with state level
Hungary	Local	After consultation with sub-regional level
Iceland	Local	In full autonomy
Japan	Local	In full autonomy
Norway	Local	In full autonomy
Poland	Local	Within framework set by central level
Scotland	Local	Within framework set by central level
Slovenia	Local	Within framework set by central level
Sweden	Local	In full autonomy
United States	Local	Within framework set by state level
Belgium (Fl.)	School	Within framework set by state level

1: Information updated, 2018.
Source: OECD (2012), *Education at a Glance 2012: OECD Indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2012-en, Table D6.9.

As the authorities responsible for the organisation of the school network vary, so do the ownership models that govern educational infrastructure. While some OECD review countries rely on the local ownership and management of school buildings, others have sought to increase administrative efficiency by centralising the ownership, administration and maintenance of their educational infrastructure. In Austria, for example, ownership of the majority of federal school buildings has been transferred to a federal agency – the Federal Real Estate Company (*Bundesimmobiliengesellschaft*, BIG). With only few federal schools remaining in the ownership of other proprietors such as municipalities, the ministry rents most of its schools from the BIG, which reinvests this revenue into the buildings' centrally co-ordinated maintenance, improvement and the network's expansion. Occasionally, the BIG receives additional investments in the form of increased

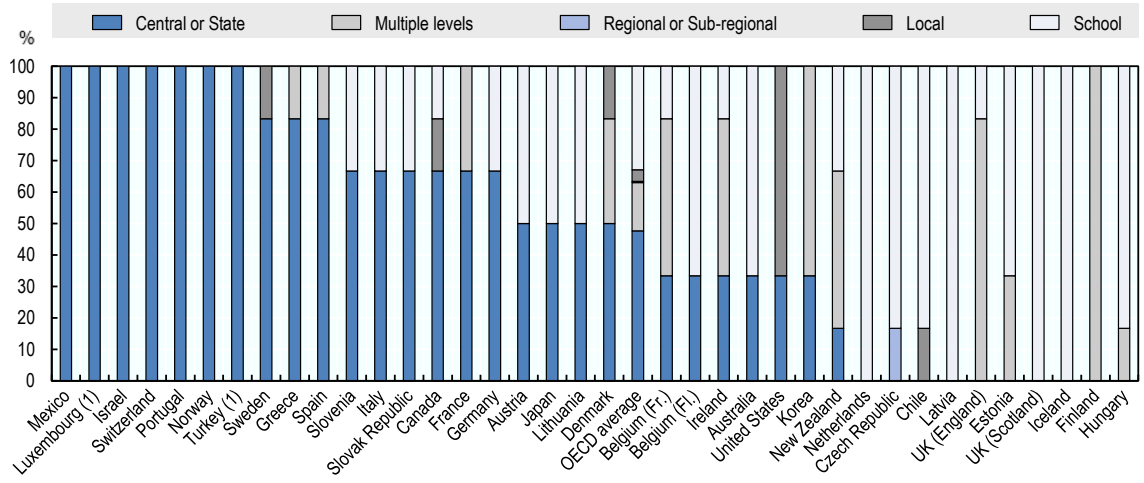
rental payments to implement major infrastructural projects adjustments such as the transformation of schools into all-day schools (Bruneforth et al., 2016[4]).

In countries where schools, school boards or local authorities are endowed with the responsibility to initiate and lead school construction projects, central governments often assume a facilitating role in relation to local actors. One example of this arrangement can be seen in the Flemish Community of Belgium where school boards have far reaching autonomy in school construction. To support school boards in the creation of effective learning spaces, the Flemish Ministry of Education has tasked the Flemish Agency for Infrastructure in Education (AGIOn) with subsidising the purchase, construction and renovation of public and private school buildings; advising schools on the planning and design of buildings through a knowledge centre, publications and websites; and providing guidance and monitoring for construction projects operated under public-private partnerships as part of the DBFM-project (Design-Built-Finance-Maintain), which established a company with a private partner (Fortis Bank-Fortis Real Estate) to head a large-scale investment to reduce the backlog in school construction works (Leemans and von Ahlefeld, 2013[5]).

It should be noted that the opening and closure of schools may occur for a variety of reasons and that different actors may be responsible for authorising and implementing the opening or closure of schools under these different scenarios. For example, systems may distribute responsibilities differently depending on whether schools are closed due to poor performance or under-enrolment and whether new schools are constructed in response to local initiatives or based on central-level enrolment projections. Likewise, some countries have devised specific arrangements that differ from the ordinary school network governance to advance specific network restructuring projects. Some urgent or large-scale infrastructural developments have thus been carried out by specialised government agencies endowed with a high degree of independence that allowed them to bypass traditional ministries and avoid certain regulations and bureaucratic procedures. As specialist centres with a highly focused mandate and consolidated expertise, these independent agencies can be more proactive, innovative and agile in their response to unanticipated situations (Blyth et al., 2012, p. 46[6]). One of the challenges governments face when delegating responsibilities to independent agencies is to ensure that their activities are effectively evaluated and coherent with those of other government bodies and programmes.

Systems differ not only in the way they assign responsibilities for the development of the school networks' physical infrastructure, but also for the distribution of educational programmes and subjects to be taught at these sites. Figure 2.1 presents the share of such decisions concerning planning and structures taken at each level of government across OECD countries in 2017. This comprises decisions on the design of programmes of study and their content as well as the selection of programmes and subjects taught in a particular school (OECD, 2018[7]). Other than decisions concerning the organisation of instruction, which mostly are taken at the school level (50%), those concerned with planning and structures are most likely to be made at the central or state level (48%). On average across OECD countries, local authorities take 4% of key decisions concerning the design and distribution of programmes and courses in lower secondary schools, while schools themselves take another 33% of these decisions and 15% of them involve multiple levels of government (OECD, 2018, p. Table D6.2[7]).

Figure 2.1. Percentage of decisions on planning and structures taken at each level of government in public lower secondary education, 2017



Note: Countries are ranked in descending order of the percentage of decisions taken at the central or state level. Decisions at a specific level of government may be made in full autonomy, or after consulting with other bodies, or within a framework set by a higher level of authority.
1: Year of reference 2011.
Source: OECD (2018), *Education at a Glance 2018: OECD Indicators*, OECD Publishing, https://doi.org/10.1787/19991487, Table D6.2.

StatLink https://doi.org/10.1787/888933831127

In 2017, in 14 of the 35 OECD countries and economies with available data, decisions on the selection of programmes to be taught in each school were taken at the state or central level, although this process may involve the consultation of lower-level authorities or schools, for example in Portugal. While 10 of the 35 systems allowed schools to decide on their selection of study programmes, all of them operated within frameworks set by a central or state authority (OECD, 2018, p. Table D6.7[7]). Even in countries with a greater overall degree of decentralisation and school autonomy, such as the Flemish Community of Belgium and the Netherlands, the central and state levels can therefore play an important role in shaping the distribution of study programmes across school sites.

Division of responsibilities for different parts of the school network

The facilities comprising a school network are often governed by multiple authorities. In OECD countries, primary education facilities, for example, are more frequently owned and governed by local administrations (Beynon, 1997, p. 7[8]), while upper secondary and special needs infrastructures are often governed by regional or central authorities. Similar divisions of sectorial responsibilities may occur between the ministries governing early childhood education and care (ECEC), compulsory and post-secondary education facilities. Where parts of the school network are subject to different administrative authorities, a low degree of integration can be aggravated by a lack of institutional co-ordination mechanisms and communication channels between providers. This can impede strategic infrastructure planning and lead to duplications in the educational offer or administrative services. Similar inefficiencies can arise where multiple public providers engage in undesired competition within a given region and level of education or

where funding models discourage municipalities from integrating different services and sharing resources between them.

Fragmented governance arrangements in the school network can result in administrative duplications, a misalignment of infrastructural investment strategies and other inefficient spending patterns. In the Flemish Community of Belgium, for example, the decentralised school system with three independent network providers has been identified as an obstacle for the efficient distribution of resources and the pursuit of central objectives concerning the quantity and quality of educational facilities. Likewise, each of the three educational networks has a central organisation employing administrative staff and operates its own pedagogical advisory services (PBDs) and student guidance centres (CLBs) funded by the Flemish government. This duplication of administrative positions and services risks generating inefficiencies and fragmented responsibility (Nusche et al., 2015, p. 115[9]; Rouw et al., 2016[10]).

In some cases, the decision for parts of the school network to be governed by different authorities is driven by instrumental considerations. The responsibility for specialised schools, for example, might be situated at the central level to pool the required resources and expertise at a scale that enables their efficient management. Special needs education and specific forms of Vocational Education and Training (VET) are therefore sometimes administered at more central levels than mainstream and general education respectively. It is important, however, to recognise that this arrangement can weaken the connections between sectors and that the advancement of inclusion or a greater integration of vocational and general education may require additional co-ordination efforts under these circumstances.

In the absence of strong co-ordination mechanisms, divided responsibilities within the school network can also negatively affect the pedagogical integration across levels of education, the alignment of their goals and implementation strategies. Particularly in education systems with high dropout and repetition rates, the failure to ensure successful student transitions from one level of schooling to the next comes at a high individual and social cost (see Chapter 4). There are some concerns linked to the integrated provision of ECEC services and its impact on children and the ECEC teacher profession, notably the risk of "schoolification" (i.e. introducing school pedagogical practices to ECEC settings, including longer days, more teacher-directed pedagogies, greater attention to academic content or less playtime) (OECD, 2017[11]; OECD, 2015[12]). Yet, particularly in contexts where transitions from ECEC to primary education are subject to frictions, integrating both services in the same administrative structures and facilities can ease students' entry into primary school. Demographic shifts and changing student enrolment patterns can provide an opportunity to efficiently repurpose school structures and advance this integration. In the Slovak Republic, for example, declining upper secondary enrolment has freed up capacities in compulsory education facilities that could be used to integrate ECEC services in the same structures as primary education (Santiago et al., 2016, p. 95[13]).

The case of Estonia is a good example of a country seeking to clarify the division of responsibilities for different levels of education to facilitate the efficient governance of the school network. In a system characterised by many small providers, Estonia's complex division of responsibilities across education levels and between providers had given rise to co-ordination problems. Municipal and state-owned schools competed with each other in general education, in special needs education and – to a lesser extent – in VET. This generated unnecessary duplication in the educational provision, reduced the

capacity for co-ordination and made planning the school network more difficult. In light of this complicated governance context and the risk of fragmentation, the efficiency of the school network – particularly at the lower secondary level – hinges on strong mechanisms for inter-municipal co-operation and resource sharing between institutions (Santiago et al., 2016, p. 83[14]).

Recent reforms in Estonia aim to improve the division of labour between its municipalities and the state, leaving the provision of pre-primary, primary and lower secondary education to the former and the responsibility for upper secondary education (both general and VET) and special education schools to the latter. The reform is expected to reduce unnecessary duplication and ambiguous responsibilities, provide the conditions for better co-ordination within education levels and assist with school network planning. For example, the new governance structure is expected to facilitate bringing VET and general upper secondary education closer together and allow all of upper secondary education to be effectively managed as a unified sub-system (Santiago et al., 2016, p. 94[14]).

The Czech Republic has grappled with similar challenges. The Czech system divides responsibilities for the school network between municipalities, which take care of primary education and the majority of lower secondary level, and regions, which provide upper secondary education. Despite this relatively clear division of responsibilities, some specialised regional schools (*gymnasia* with eight-year and six-year programmes) also compete with municipal schools for enrolment at the lower secondary level, generating some duplication of services that has been argued to exacerbate inefficiencies in the school network caused by demographic pressures (Shewbridge et al., 2016, p. 74[15]).

2.2. Central-level steering and co-ordination for effective network planning

Despite the trend towards decentralisation in the governance of OECD education systems, central authorities remain a critical actor in the planning and co-ordination of the school network. Depending on the precise distribution of responsibilities, central-level authorities have different tools at their disposal to steer the development of the school network in line with policy priorities and improve the efficiency of its organisation. These range from direct interventions into the organisation of the school network to efforts to ensure that local network reforms maintain traction by monitoring progress and, where appropriate, challenging local or regional authorities. Furthermore, central authorities in many OECD countries dispose of more indirect means to advance efficiency in the school network, including the provision of central information systems to support the regional planning of school infrastructure; facilitating local co-ordination; setting financial incentives and providing guidelines for infrastructural development projects; regulating school and class sizes; and regulating the creation of new schools, school choice or catchment areas. The full extent of central-level steering capacity in decentralised systems where the design and planning of school networks lies at the local level was illustrated during Lithuania's network restructuring process (Box 2.1). The following sections will explore some of these tools in more detail, providing the context for Chapter 3 and the analysis of concrete strategies to adapt the school network in response to changing levels of demand.

Box 2.1. Central-level strategic steering of local school network reform in Lithuania

Over the past decades, the Lithuanian school network has been subject to a significant reorganisation, with the number of general education schools dropping from 1 499 in 2004/05 to 1 022 in 2015/16. Although municipalities are responsible for planning their school network, the central government has actively steered the restructuring process in order to maintain its momentum and ensure that the provision of high-quality education remains the central goal of the reform. In particular, the Ministry of Education and Science has played a key role in initiating the reorganisation process, providing its strategic direction and devising rules to guide it. In 2011, the ministry determined that the structure of general education should be reformed by replacing previous "secondary schools" and transforming them into either *gymnasia* (offering the second part of lower secondary and upper secondary education), basic schools (offering the first and second part of lower secondary education and in some cases primary education) or into the newly-introduced pre-gymnasia (offering the first part of lower secondary and in some cases primary education). Since 2004/05, 451 secondary schools were transformed into gymnasia, basic schools or pre-gymnasia (of which 112 were operating by 2015/16). At the same time there has been a significant reorganisation of primary and basic schools: 219 basic schools were re-organised into pre-gymnasia, gymnasia or a basic or primary education unit within a secondary school; 179 primary schools were closed or transformed into gymnasia, basic schools or a primary units within pre-gymnasia.

The reorganisation process at the local level was guided by central rules and parameters, based on which municipalities were expected to advance the reform of their school networks. To deal with the particular challenges experienced in rural areas, the government set out priority measures to address the preservation of small primary schools in rural areas and concerns about safe transportation to school. These priorities aimed to ensure that the provision of high-quality services would be the central objective in advancing the school network reform and would not be compromised by purely economic considerations. As part of the phasing out of "secondary schools", an accreditation process has been put in place to determine whether existing secondary schools that wish to convert into gymnasia can meet the more rigorous requirements of the curriculum at Years 11 and 12. Conditions for their transformation include a sufficient number of students studying in secondary education programmes and a given number of classes at Years 11 and 12. Thresholds vary, however, depending on the population that a school serves (for example rural or urban; border area; language of instruction).

In order to support school consolidation initiatives the central administration provided a rich array of data, analyses, models and the ministry's "Recommendations for Establishing a Network of Schools", which includes national guidelines for municipalities. Another important document supporting the school network reform was the "Workbook for Municipalities", which the ministry piloted with six municipalities. The ministry also prepared sample plans for school network reform that municipalities could use as a basis for their planning and collected data on student achievement at the municipal and school level. These data-rich publications were a key resource in negotiations with different municipalities, to inform public consultations and to communicate the key principles of the school network reform.

Source: Shewbridge et al. (2016). *OECD Reviews of School Resources: Lithuania 2016*, OECD Publishing, Paris, http://doi.org/http://dx.doi.org/10.1787/9789264252547-en (pp. 55 ff., 61).

Guidelines for infrastructural development and school construction projects

Some countries have issued central guidelines for the construction of school facilities in order to reduce the cost of planning procedures for infrastructural development and ensure the fulfilment of quality standards and policy objectives related to issues such as environmental performance or inclusive educational settings (see Box 2.2 for an example of such guidelines in England). Centrally set and monitored norms for educational facilities can be particularly useful where the planning of school networks and individual facilities is the responsibility of local authorities with insufficient capacity to effectively engage in the planning of infrastructural developments. This tends to be more frequently the case at the level of primary education (Beynon, 1997, p. 7[8]).

School networks can make significant long-term efficiency gains by sharing and employing best practices for the construction of high-quality and flexible school facilities. Providing architects with guidelines and objectives for the creation of learning spaces that support a variety of pedagogical practices and offer enough flexibility to respond to changing student needs can reduce the initial cost of construction, but also expenditures on maintenance and remodelling works in the long term (Beynon, 1997, p. 60 f.[8]). Several large-scale infrastructural development projects have taken this approach, including Portugal's Secondary School Building Modernisation Programme (SMP), which comprised the rebuilding, extension, adaptation and re-equipment of 173 schools. As part of the modernisation project, *Parque Escolar* (a special-purpose state-owned company charged with overseeing its planning and delivery) assembled a design manual providing architects a range of guidelines ranging from requirements for classroom layouts to technical guidance on acoustics and lighting, drawing on the findings of consultations with various experts and stakeholders (Blyth et al., 2012[6]).

Box 2.2. Central guidelines for efficient school construction in England

In England (United Kingdom), there were three major allocations of public funding for capital expenditures (delivered as a capital grant) in 2013/15: basic needs funding allocated to local authorities to provide additional school places where needed in their area (based on projections of need and enabling authorities to plan provision over the coming two years); maintenance funding (allocated to local authorities or direct to schools, depending on the management of the school); and devolved formula funding allocated direct to schools. Additional targeted funding (targeted basic need programme) was announced to provide additional support to local authorities with the greatest demographic pressures to expand the provision of school places.

A "Priority School Building Programme" was also established to target the renovations or rebuilding of schools in the worst condition across the country (a total of 537 schools). The Education Funding Agency (which was merged with the Skills Funding Agency in April 2017 to form the Education and Skills Funding Agency) designed the programme to make more efficient use of public funding. First, schools are grouped into "batches" to improve efficiency in procurement time and costs. Second, the programme promotes a more standardised design to support construction efficiency and principles for future sustainability. It specifies standard designs, services and performance requirements for each school.

The facilities' output specification comprises: a generic design brief with requirements for all schools; a school-specific design brief (e.g. reflecting special needs provisions); schedules of accommodation comprising a list of rooms and spaces required in each school; and area data sheets which identify the requirements for each room and space listed in the schedule of

accommodation (comprising services, environmental performance requirements, fittings, furniture and equipment and Information and Communication Technology [ICT] provision). Key design principles guiding the project relate to functionality, health and safety, a standardised approach, sustainability and future-proofing (i.e. the flexibility to adapt school facilities to changing enrolment patterns, curricular provision and teaching methods). These principles are illustrated in a set of baseline designs for schools which can be consulted at www.gov.uk/government/collections/school-building-design-and-maintenance.

Source: OECD (2017), *The Funding of School Education: Connecting Resources and Learning*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264276147-en.

Central funding mechanisms and incentives for local network efficiency

In school systems that use central formulas to distribute financial resources to lower-level authorities or schools, the choice of the formula's parameters can set incentives for greater network efficiency and steer the development of the school network in line with policy objectives. Increasing the weights for students attending specific types of schools, for example, can encourage their expansion where they are in short supply or encourage specific forms of educational provision, such as teaching in integrated classrooms for special educational needs (SEN) students. Given that per-student fixed costs are higher in small schools, strict per-capita funding places larger providers at an advantage and thereby indirectly encourages school consolidation. Alongside direct interventions into the school network, such as one-off payments to support municipal school consolidation projects, the design of funding allocation mechanisms therefore provides a particularly important instrument for systems with significant excess capacity to encourage the rationalisation of their networks. Reducing the funding for schools that remain below a given class sizes threshold for multiple years or the amount of additional allocations to small schools are common ways to exert indirect pressure towards school consolidation in these contexts.

Reconciling incentives for a rational organisation of the school network with the recognition that small schools face an additional burden and should be compensated accordingly – particularly where consolidation is not an option – poses a challenge for many school systems. Some of the strategies governments have explored to resolve this tension include i) limiting incentives for school network consolidation to higher levels of education for which the proximity of provision to students' homes is considered less of a priority, ii) granting protected status and guaranteed additional funding to remote schools whose maintenance is critical to the school network, iii) offering financial incentives for network consolidation in the form of direct grants provided outside the main funding formula (see more in Chapter 3). The funding system in Estonia provides examples of some of these techniques (see Box 2.3).

Countries that place a premium on school choice and curricular diversity, rather than economies of scale and the efficiency of the school network, often design funding mechanisms with a view to safeguarding the provision of a wide range of courses and maintaining small classes. In the Flemish Community of Belgium, for example, the funding formula for secondary education assigns a greater weight to students enrolled in small courses, thus encouraging teaching in smaller classes and maintaining access to course options which could not otherwise be offered. In addition, funding is based on regressive scales, calibrating student coefficients to rise in value as course enrolments fall. While this approach ensures a wide range of diversified course options, it risks to

exacerbate inefficiencies arising from the operation of a fragmented school network, particularly in conjunction with a relatively fragmented curriculum and a large number of small schools. Authorities should be aware that this funding model penalises schools that seek to achieve economies of scale by consolidating their programme offer or establishing co-operations between schools (Nusche et al., 2015, p. 113 f.[9]).

Box 2.3. Reconciling incentives for network efficiency with funding for small schools in Estonia

In recognition of the higher resource needs of small schools, Estonia's school funding formula contains coefficients that are designed to give additional resources to municipalities that operate small schools while at the same time providing them with incentives to engage in school consolidation. Since the Estonian government is committed to providing primary education close to the place where students live, the formula used to allocate education salary grants to local governments is primarily designed to encourage consolidation at the lower secondary level (Years 7-9).

Municipalities that close lower secondary schools continue to receive funding for these students for multiple years, while the municipality that takes them on immediately also receives whichever level of funding was assigned to them prior to the consolidation. This was particularly relevant prior to 2017, when an Administrative Reform Act reduced the number of Estonian municipalities from 213 to 79. Until then, half of them had only operated a single school.

At the upper secondary level, support for consolidation is further supported through direct investment grants. Local governments that reduce their number of upper secondary schools are eligible for special investment grants and the national government fully covers the cost of transportation for students who decide to commute to one of the newly constructed state-run gymnasiums. In addition, to provide local governments with greater long-term financial security when planning the reorganisation of their school networks, the coefficients used to allocate both salary and equalisation grants were fixed in 2015 and are no longer subject to annual changes.

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

For any such funding formula-based incentives to enhance the school network's efficiency, its objectives and the factors that drive the distribution of funding need to be transparent to schools and local authorities (OECD, 2017[2]). A clear public communication strategy and coherent messaging can help to dispel ambiguities and provide school leaders or local authorities with a good understanding of the trade-offs they face and their financial implications. For example, as has been suggested in the case of Estonia, authorities could adjust the funding formula such that it covers teacher salaries only for classes exceeding a given minimum threshold and ensure that municipalities understand that maintaining smaller classes would require them to contribute additional resources (Santiago et al., 2016, p. 98 f.[14]). However, it should be born in mind that some small municipalities and schools have limited capacity and manoeuvring space to adequately adjust their resource use in response to financial incentives (Blanchenay, Burns and Köster, 2014[16]).

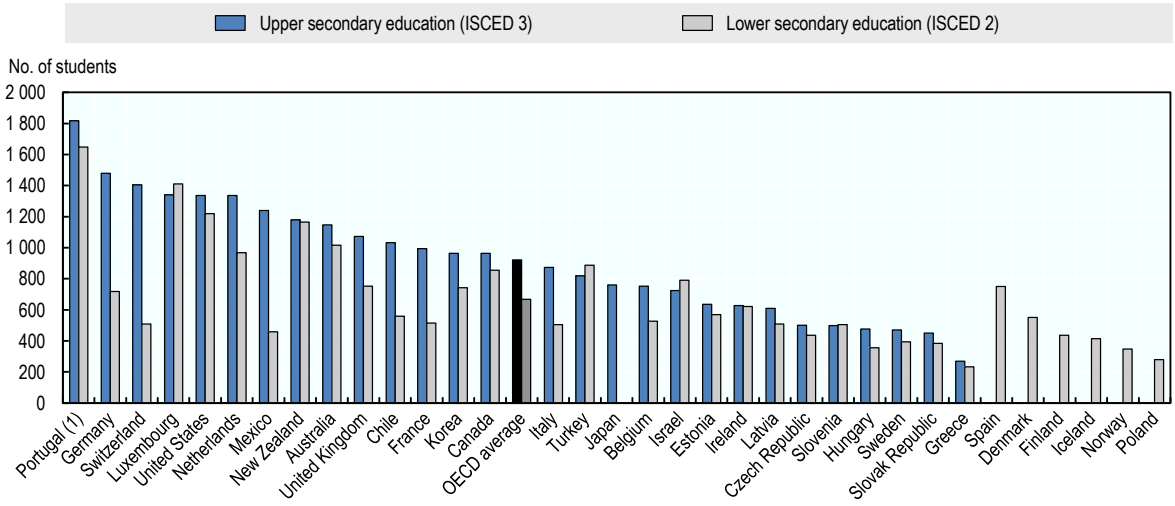
The distribution of spending responsibilities and the mechanisms used to distribute funding across levels of government also plays a critical role in shaping the incentive structure for the efficient organisation of the school network. Complex governance arrangements in Austria, for example, provide municipalities with little incentives to engage in the strategic planning of their school networks since they bear few of the financial consequences generated by its inefficiencies. Under a system sometimes described as "distributional federalism", the federal government provides provinces with annual funding for teacher salaries based on previously agreed staff plans. However, provinces are free to hire more teachers than foreseen in these annual plans and the federal level covers part of the additional expenditure generated as a result. This arrangement has encouraged overspending and caused the number of excess teaching positions at general compulsory schools to almost double from 1 039 to 2 063, between 2006 and 2010. In addition, Austrian municipalities face financial incentives to resist school closures, since consolidating municipalities are required to compensate the constituency which absorbs their students to cover part of its increased infrastructure and non-teaching staff expenditures (Nusche et al., 2016, p. 26[17]).

By contrast, aligning financial responsibilities with the degree of local autonomy for the planning of the school network can generate strong incentives in the opposite direction, prompting strategic reflections at the local level on ways to increase the efficiency of the school network. For example, both Norway (1986) and Sweden (1993) decentralised their school funding systems by providing local authorities with block grants from the central level. Although the amount of per-pupil funding remained unchanged, reforming the mechanism through which it was distributed and decentralising spending responsibilities incentivised local authorities to generate savings by reorganising their rural school networks (Sigsworth and Solstad, 2005[18]). Likewise, in Denmark, municipalities can devise their own school funding formulas and adapt them to local conditions and the concerns of the local community (Nusche et al., 2016, p. 82[19]).

Regulations concerning school and class sizes

The regulation of school and class sizes is an important steering tool in the governance of the school network. It can serve as a means to improve the efficient use of public funds, steer rationalisation processes and provide incentives for co-operation among schools. As can be seen in Figure 2.2, the average size of secondary schools varies considerably across OECD countries around an average of 668 students at the lower secondary level and 921 at the upper secondary level. In systems at the extreme ends of the spectrum, more than 1 400 students attend average upper secondary schools and more than 1 200 attend average lower secondary schools, while upper and lower secondary schools in Greece are the smallest with an average enrolment of 269 and 233 students respectively. In general, primary schools tend to be significantly smaller than those at the secondary level and lower secondary schools are on average smaller than upper secondary schools in all OECD countries with available data, apart from Luxembourg, Turkey and Israel.

Figure 2.2. Mean school size at the upper and lower secondary levels, 2015

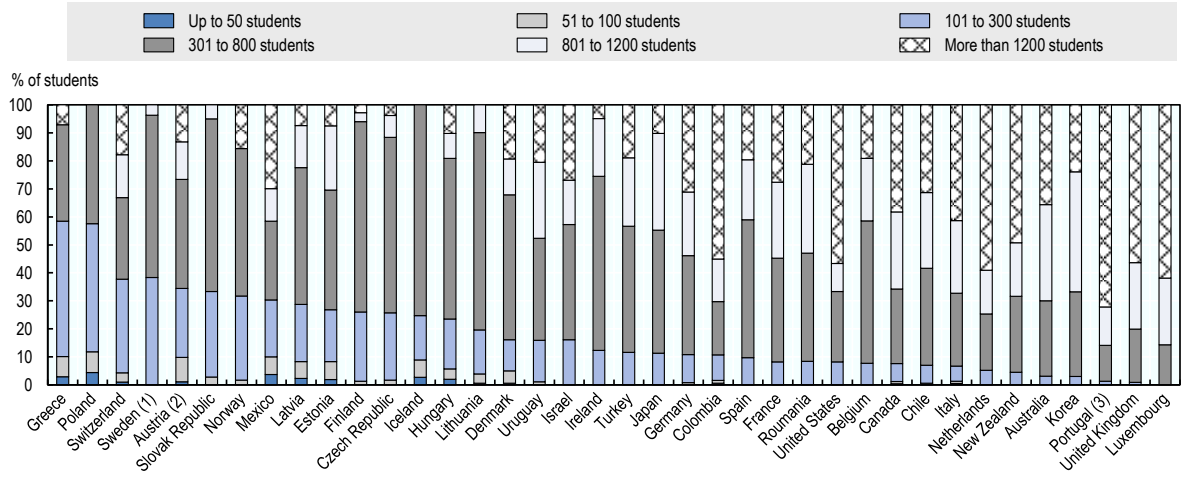


Note: Countries and economies are ranked in descending order of students per school at the upper secondary level (based on school principals' reports). Missing bars due to insufficient number of observations to ensure comparability (i.e. there are fewer than 30 students or fewer than 5 schools with valid data).
1: Number of students refers to school clusters (see *PISA 2015 Technical Report*, Table 4.3).
Source: 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.

StatLink https://doi.org/10.1787/888933831146

One of the biggest challenges for the efficient organisation of the school network, particularly in rural areas, is a low population density. In multiple OECD review countries, this has been aggravated by declining birth rates and rural-urban migration (see Chapter 3). As a result, many of the affected countries have seen a significant reduction in the average school size for parts of their network. As can be seen in Figure 2.3, the proportion of 15-year-olds attending small secondary schools with fewer than 300 students is lower than 15% in the majority of OECD countries. Nevertheless, they account for at least one third of students in six countries and more than half in Greece and Poland. The structural variation in school networks is even more apparent for the prevalence of very small secondary schools with fewer than 100 or 50 students. While their proportion is negligible in the majority of OECD member states and review countries, more than 5% of 15-year-olds in the PISA sample attend such schools in Austria, Estonia, Greece, Hungary, Iceland, Latvia, Mexico and Poland.

Figure 2.3. Size of schools attended by 15-year-old students, 2015



Note: Countries and economies are ranked in descending order of the proportion of students in schools with fewer than 300 students (based on school principals' reports). School size categories with fewer than 30 students or fewer than 5 schools are displayed as 0.
1: PISA 2012 data
2: PISA 2009 data
3: Number of students refers to school clusters (see PISA 2015 Technical Report, Table 4.3).
Source: Authors' analysis based on PISA 2015 data.

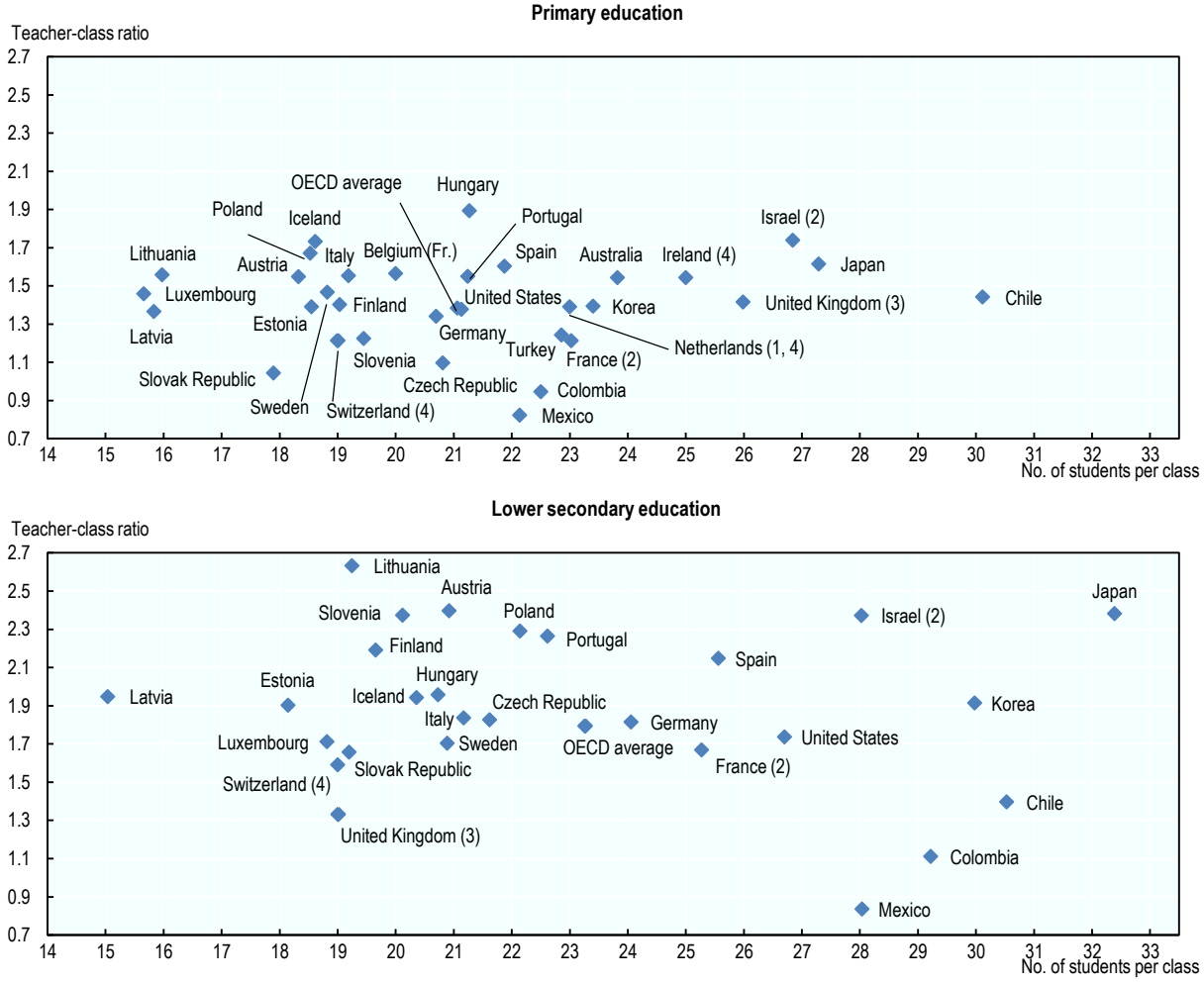
StatLink https://doi.org/10.1787/888933831165

Subject to school network reforms and demographic shifts, the size of schools has undergone significant changes in some OECD school systems. Between the 2009 and 2015 waves of the OECD Programme for International Student Assessment (PISA) survey, the proportion of 15-year-olds in schools with fewer than 300 students has increased by more than 10 percentage points in Sweden and the Slovak Republic, while dropping by close to the same magnitude in Italy and Slovenia. In Greece, Romania and Poland, enrolment in very small secondary schools with fewer than 100 students has risen by more than 3 percentage points over the same period of time while it has dropped significantly in Latvia, Sweden and Turkey. At the other end of the spectrum, multiple OECD countries have significantly raised the proportion of 15-year-olds enrolled in large schools with more than 1 200 students between 2009 and 2015, increasing it by more than 10 percentage points in Belgium, Denmark, Germany, Italy, the Netherlands and the United Kingdom (based on the authors' analysis of PISA 2009 and 2015 data).

The proliferation of very small schools has important fiscal implications, given that expenditure per student tends to be highest in small schools (Falch, Rønning and Strøm, 2008[20]; Østergaard Larsen, Houlberg and Schindler Rangvid, 2013[21]). At the same time, research from multiple countries suggests that providers can generate economies of scale by increasing school size up to a certain enrolment level (although marginal returns to scale tend to diminish and diseconomies of scale may emerge in very large schools) (Ares Abalde, 2014[22]). One of the main reasons why larger schools are able to reduce per-student costs is their ability to fill classes up to the maximum number of students (Knoth Humlum and Smith, 2015[23]). Conversely, very small schools are more prone to suffer from underutilisation (i.e. large spaces and high staff numbers for few students), which can put considerable pressure on public resources.

Even though, within a given school system, schools with small classes tend to face higher per-student staff costs, the link between average class size and student-teacher ratios is surprisingly weak across countries. As illustrated in Figure 2.4, countries with similar class sizes can have very different teacher-class ratios depending on the number of classes for which a teacher is responsible, the amount of instruction time compared to the length of teachers' working days, how students are grouped within classes and the use of team teaching. For example, while the average class size in Luxemburg primary schools is the lowest of any OECD country, the number of primary teachers per class is only slightly above the OECD average (1.46 in Luxembourg, compared to 1.39 in the OECD on average), which results in a student-teacher ratio comparable to that of some countries with above average class sizes. The number of teachers per class also tends to increase with the level of education, reflecting increased annual instruction time for students and fewer instruction hours per teachers as their specialisation and the number of different courses on offer increases. Correspondingly, the number of students per class is higher in lower secondary than in primary education in most OECD countries (Figure 2.4).

Figure 2.4. Class size and teacher-class ratio in primary and lower secondary education, 2015



1: Primary includes pre-primary education.
2: Public and government-dependent private institutions only.
3: Lower secondary education comprises secondary schools for age 11-16.
4: Public institutions only.
Source: OECD (2017), *Education at a Glance 2017: OECD Indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2017-en, Tables D2.1 and D2.2; Lithuania: Eurostat.

StatLink https://doi.org/10.1787/888933831184

Given that, all else being equal, smaller classes are associated with higher staff costs and may require greater administrative and organisational effort (Hanushek, 2011[24]; Rivkin, Hanushek and Kain, 2005[25]), the regulation of class sizes has featured prominently in discussions surrounding the efficient organisation of the school network. The strongest objections to the increase of class sizes are based on the perception that smaller classes are conducive to educational quality since they permit teachers to devote more attention to individual students and employ a wider range of pedagogical approaches (see Box 2.4). The empirical evidence on the effects of class size on student outcomes are contested (Krueger, 2003[26]; Hanushek, 1997[27]). The best-identified studies from large-scale experiments such as the Tennessee's Student Teacher Achievement Ratio (STAR) study suggest that reducing class sizes from kindergarten through third grade to around 15 students had a positive effect on achievement and some longer-term outcomes, particularly for students from disadvantaged backgrounds (Chetty et al., 2011[28]; Dynarski, Hyman and Schanzenbach, 2013[29]).

The effect of class size appears to be smaller for older students and varies considerably across countries (Wößmann and West, 2006[30]). Relatively small or absent effects in many schools systems have been taken to suggest that student learning can be more effectively supported through other means than class size reductions (Hattie, 2009[31]). Proposals for such alternative investments include the increase of teacher salaries, investments in their professional development or the hiring of extra assistant teachers and other para-professionals. Although long-term effects of class size reductions on students' future earnings have not been conclusively demonstrated in the United States (Chetty et al., 2011[28]), evidence from Sweden points to long-term wage increases that could offset some of the cost associated with smaller classes (Fredriksson, Öckert and Oosterbeek, 2013[32]). Nevertheless, few studies have directly compared the cost and benefit of class size reductions with those of alternative interventions (Chingos, 2013[33]).

Box 2.4. Trade-offs in decisions concerning the use of teacher resources

Holding other factors constant, organising students in smaller classes is more expensive since it requires more staff resources per student. While smaller classes are often assumed to improve educational quality by allowing teachers to focus more on the needs of individual students, the effectiveness of class size reductions needs to considered in comparison with competing strategies to improve student outcomes.

Some studies indicate that smaller classes can improve non-cognitive skills (Dee and West, 2011[34]) and others have found these effects to be more pronounced among students from disadvantaged socio-economic backgrounds (Piketty, 2004[35]; Dynarski, Hyman and Schanzenbach, 2013[29]). Most studies that rigorously identify effects of class size reduction, however, have focused on the earlier years of education (Chetty et al., 2011[28]) and cross-national evidence from OECD countries has generally found a weak association between smaller classes and the performance on standardised tests, attainment or degree completion (OECD, 2013[36]). Some of these inconsistencies may arise from the assignment of less qualified or experienced teachers to smaller classes. Another reason may be that marginal reductions in class size only translate into better outcomes once they enable teachers to employ different pedagogical practices (Santiago et al., 2016, p. 27[13]).

Given the trade-off between investments in lower class-size and other priorities, some high-performing systems, such as Shanghai and Singapore, have chosen to reduce teacher workloads instead to enable them to spend more time on professional development (Jensen et al., 2012[37]). Others have proposed increasing class sizes to invest in higher salaries for teachers, teaching technology, or more widespread use of assistant teachers (OECD, 2014). Recent findings from the 2013 OECD Teaching and Learning International Survey (TALIS) show that the proportion of a teacher's students with behavioural problems remains a strong predictor of low job satisfaction, while the size of their classes is insignificant in most participating countries (OECD, 2014, pp. 445, Box D2.1[38]). This underlines the importance of ensuring that teachers are well-equipped to teach diverse and challenging classrooms regardless of their size.

Sources: OECD (2014), *Education at a Glance 2014: OECD Indicators*, http://dx.doi.org/10.1787/eag-2012-18-en; Jensen et al. (2012), *Catching Up: Learning from the Best School Systems in East Asia*, Grattan Institute, Melbourne, Victoria.

Maximum class size regulations

Based on concerns for educational quality and the well-being of students and teachers, many OECD countries specify an upper bound or recommend a maximum size for school classes. This threshold may vary across different types of provision, educational levels or according to the size of schools. In Estonia, for example, new state-run upper secondary general schools are expected to proscribe a maximum class size of 28 students for small schools (planned for 252 students), 30 students for medium-sized schools (planned for 360 students), and 36 students for schools located in larger towns (planned for 540 or 750 students). In addition, the maximum class size for students with SEN is considerably smaller, depending on the severity of their learning difficulties (Santiago et al., 2016, pp. 166, Table 4.5[14]).

Hard upper bounds to maximum class sizes may pose challenges for a number of reasons. Since both educators and parents tend to have a preference for smaller classes, school leaders might seek to artificially increase enrolment by flexibly applying age-at-entry rules or moving students between grades if they are close to the cut-off. For example, data from Israeli primary schools, which need to split classes once they exceed 40 students, provides clear evidence of this practice (Angrist et al., 2017[39]). At the same time, particularly in constituencies with limited funding capacity, maximum class size rules can put schools under financial pressure and cause teacher shortages in case they have to unexpectedly split classes. Evidence from California's class-size-reduction programme indicates that the need to split classes has compelled many disadvantaged schools to hire inexperienced and less qualified teachers, which offset some of the benefits associated with smaller classes (Jepsen and Rivkin, 2009[40]). In order to ease the financial burden resulting from an unexpected increase in the number of required classes, small schools are sometimes provided with additional financial support or permitted to exceed the maximum number of students. Such exceptions may be grated after obtaining permission from a relevant authority (Santiago et al., 2016, p. 27[13]) or for a limited period of time (e.g. one academic year in a specific class) and may be conditional on certain provisions (e.g. ensuring that all health and safety requirements are met), as is the case in Estonia (Ministry of Education and Research, 2015, p. 45[41]).

Minimum class size regulations

While the specification of maximum class sizes is common practice, there are many cases in which schools remain well below this threshold, to the extent that their operation raises concerns for the efficiency of the school network. Particularly in systems where the responsibility for the operation of schools is relatively decentralised, the authority to set minimum class and school sizes has therefore come to constitute a powerful steering tool with which central authorities influence the organisation of the school network (Shewbridge et al., 2016, p. 66[15]). The potential effects of minimum class size rules need to be carefully considered as they are likely to vary across contexts and the level of education to which they are applied. Particularly in sparsely populated areas, they may exert pressure leading to the closure of schools or reduction of their course offer. All else being equal, minimum class sizes are also likely to have a greater effect on schools with a more diversified course offer, as is commonly the case at higher levels of education.

Once defined, minimum class size rules may be used for different purposes. Some countries use them as thresholds for recommending or requiring schools to initiate the merger of multiple small classes or provide them with additional support if the size of their classes requires specific pedagogical arrangements such as multi-grade teaching. Minimum class sizes may also be used to impose sanctions such as a reduction in funding if a school remains below the threshold for multiple years, or to define the maximum number of teachers required for a given number of students. To the same effect, some Danish municipalities use national guidelines on *maximum* class sizes to fund schools according to the minimum number of theoretically required classes (Nusche et al., 2016, p. 71[19]).

School and class size regulations that are not attuned to student needs and regional context can undermine quality and efficiency objectives

While the regulation of school and class sizes can play an important role in the governance of school networks, it is important to bear in mind that there is no "one size fits all" solution. Regulations concerning minimum class or school sizes should allow for variation across levels of education and locations. Even though providing incentives for municipalities to create larger schools and classes may improve school quality and efficiency in some contexts, enforcing a lower bound to school sizes may be unfeasible in geographically isolated areas (Andrews, Duncombe and Yinger, 2002[42]), just as increasing the size of classes may not be an option for small schools admitting only a single class per year.

Under per capita funding regimes, small classes tend to place a financial burden on schools anyway and further sanctioning their operation may be counterproductive and detrimental to their ability to provide high-quality education (Santiago et al., 2016, p. 183[14]). To account for this challenge, authorities may specify a threshold or average school class size below which students would not be funded, while offering schools an option to be exempted from this rule subject to their identification as meriting a protected status. This serves to ensure that students in remote areas are not placed at a further disadvantage and that school owners and local authorities can deliberate whether to engage in consolidation processes or contribute funding out of their own budgets to keep schools open at their current level of enrolment.

In the absence of a clear consensus on optimal school or class sizes, local authorities with sufficient authority and capacity play an important role in developing context-specific strategies to improve the efficiency of their school networks. As discussed in more detail

in Chapter 3, a range of different strategies have proven effective in offsetting the disadvantages of small remote schools without further tightening their budgets or removing them from their communities. Especially in systems with a tradition of local autonomy, involving local communities in the restructuring of the school network can be more effective than driving the process through national-level regulations as it allows for contextual characteristics to be taken into account. Nevertheless, central-level actors should ensure that the adjustment of school network structures remains high on local political agendas and that it is guided by school quality at least as much as it is by concerns for economic efficiency (Nusche et al., 2016, p. 91[19]).

School licensing and the role of private providers

A central issue for the governance of the school network are the rules and procedures for setting up new schools. The criteria employed in the licensing and funding of new schools are not only critical to ensure a high quality of educational provision, they can also serve as steering tools supporting the rational organisation of the school network. Low barriers to entry and incentives for the establishment of new (public and private) providers can be a way to expand the capacity of the school network and broaden parental choice. Inducing greater dynamism in the school network is often expected to yield innovation and facilitate the replacement of ineffective providers by competitors of higher quality or productivity. Yet, the unplanned school closures characterising many high-turnover systems are disruptive events for students that can negatively impact their social and educational outcomes (Grau, Hojman and Mizala, 2018[43]). To compensate for these adverse effects, newly opened schools would need to be of significantly higher quality than those leaving the network, which need not be the case in practice. Licensing procedures that regulate the entry into of new providers therefore play an important role in supporting equity, educational quality and efficiency in dynamic school networks.

The licensing process often requires prospective school owners to submit a range of information to the license-granting authority and any standing or ad hoc expert committees involved in the process. These dossiers may include the school statutes, its proposed curriculum, the qualifications of school management and teachers, information about facilities, development plans etc. In some cases, the licensing process involves binding agreements between school founders (e.g. self-governing regions, municipalities, regional state authorities), which may impose additional criteria for the provision of school services and define quality standards, minimum class and school sizes or maximum commuting distances for students.

The ultimate responsibility for the creation of public schools may be shared between multiple authorities and vary by school type. The process of registering new schools, revoking their license or recommending their consolidation may also draw on the assessment or recommendation of other public bodies, for example the school inspectorate in the Slovak Republic (Santiago et al., 2016, p. 41[13]). For specific school types, such as vocational schools in Estonia, employers other social partners can play a role in the process too (Santiago et al., 2016, p. 73[14]). Given that decisions to open a school are frequently made by local authorities, many systems face challenges when trying to ensure that the process is transparent and that decisions are based on an assessment of quality and need, as the review team observed, for example, in the Slovak Republic (Santiago et al., 2016, p. 22[13]).

Differential standards for admission and tuition practices can generate an uneven playing field between public and private providers

School systems vary in their approach to licensing independent private schools and government-dependent private schools (i.e. those receiving a majority of their funding from public agencies). Encouraging the entry of private providers, for example through public subsidies, is usually intended to stimulate competition between schools and provide parents with a greater diversity of educational approaches to choose from. Distinct licensing criteria for private schools may therefore give them greater freedom to teach innovative curricula or a flexible programme to encourage this pedagogical diversity. However, when it comes to factors like the ability to select students, applying different standards to public and private schools can raise significant equity concerns related to the segregation of students and the allocation of public resources (Boeskens, 2016[44]; Waslander, Pater and van der Weide, 2010[45]).

Chile provides a good example of a country that has experienced and recently addressed this challenge. Until the 2015 Inclusion Law (*Ley de Inclusion*) put an end to the practice, government-dependent private schools were eligible for the same amount of funding as public schools while retaining the right to charge parental fees and engage in selective admission practices (Santiago et al., 2017[46]). This has contributed to the country's high level of socio-economic segregation as middle class students increasingly left the public school system to enter subsidised private schools whose tuition and admission policies had put them at a financial advantage while effectively excluding many disadvantaged students (OECD, 2017, p. 85 f.[2]). Most countries acknowledge this risk of "cream skimming" or competition based on selectivity rather than educational quality and therefore apply the same admissions regulations for public and government-dependent private providers and ensure that tuition fees do not exclude disadvantaged students from attending publicly funded schools.

The process of licensing new schools can facilitate or undermine the rational organisation of the school network

Independent of concerns related to equity and segregation, licensing and funding arrangements that strongly encourage the entry of private providers can come at the expense of efficiency in the school network. Even though, on average across the OECD, private schools are larger than public schools and there is no significant difference in their class size, an influx of private providers encouraged by low barriers to entry or preferential funding conditions can contribute to the fragmentation of the school network and lead to smaller average school and class sizes, thus thwarting efforts to provide education services at a greater scale. Systems in which funding follows students across sectors therefore need to carefully define the conditions under which different services and providers should be eligible for public funding, in order to guarantee a high quality of provision and to protect students' interests while avoiding a fragmentation of the school network.

Estonia, for example, has seen a significant increase in the number of government-dependent private schools, which are entitled to the same amount of funding as public schools, provided that they do not charge tuition fees exceeding 25% of the monthly minimum wage. These schools have significantly smaller classes than public schools, counting 15 and 12 students in primary and lower secondary education respectively, compared to the system-wide averages of 17 and 16 students per class (Santiago et al., 2016, p. 76[14]). While the opening and closure of municipal schools is

the responsibility of local governments acting within a central regulatory framework, private schools in Estonia are not subject to the same control. As in many OECD countries, the expansion of the private sector therefore not only comes with the prospect of greater competition, but also that of diminished public control over the planning of the school network. Given the country's ongoing challenge to adapt the school network to shrinking cohort sizes, the funding and regulation of private schools has raised significant efficiency concerns (Santiago et al., 2016, p. 94[14]).

The misalignment between a system's policy priorities for the school network and its process for the creation of new schools can also significantly diminish the scope for strategic network planning and thwart efforts to reorganise the school offer. Between 2007 and 2013, for example, Danish municipalities have responded to shrinking cohort sizes by closing down smaller schools and reorganising the management of schools by joining several schools under the same leadership. As a result, they reduced the total number of municipal schools by more than a fifth and increased the average size of a *Folkeskole* (public primary and lower secondary schools) from 362 to 442 students. However, the potential for private schools to emerge and replace the recently closed public schools has raised concerns that the low barriers to entry for private providers might undermine their efforts to rationalise the school offer. Even though it is difficult to establish the extent of this phenomenon, municipal leaders repeatedly reported to the OECD review team that the closure of public schools has led parents to set up a private school in the same location, particularly in rural areas with strong parental engagement (Nusche et al., 2016, pp. 55, 90[19]). The fact that private schools are funded by the state rather than the municipalities has aggravated this problem, since it gave local authorities little incentives to apply stricter standards for the creation of new schools. A similar phenomenon has been reported in Norway, where parents in multiple rural communities decided to shift to Montessori pedagogy when faced with the prospect of municipal school consolidation, which made them eligible for state-funding under the country's Private Schools Act (Lauglo, 2010[47]).

The Flemish Community of Belgium – another system that places great emphasis on school choice and autonomy – has responded to similar efficiency concerns by financing school associations to encourage collaboration between schools with management and administrative support. Such initiatives can offset some of the cost associated with diseconomies in fragmented school networks and foster co-operation in a competitive choice-based system that provides few incentives for collaboration. However, the cost of supporting school associations and similar platforms to remediate diseconomies in fragmented school networks needs to be weighed against the potential efficiency gains afforded by a broader public ownership of school facilities or increased control at the point their creation (Nusche et al., 2015, p. 115 f.[9]).

In order to align procedures for the creation of new schools with the pursuit of greater efficiency in the school network, some systems have tied the licensing and funding of education services to an assessment of both quality and needs. In regions without a clear case for unmet demand, schools might for example be required to serve a sufficient number of classes above a given threshold before qualifying for inclusion into the network of publicly funded providers. Historical examples of the introduction of such need-based licensing procedures include the Czech Republic, where a reform of the Education Act in 1995 aimed to tighten up access to public funding and the entry into the School Registry of Schools and School Facilities (see Box 2.7). The revision imposed a stricter set of criteria to be fulfilled for the public funding of school providers as well as specifying under which conditions a school would be removed from the school registry.

This significantly reduced the number of private schools (MŠMT, 2016[48]). As described in Box 2.5, Colombia provides another example for the needs-based licensing and funding of private schools, which ensures that they complement the public offer and are strategically drawn on to address capacity shortages in the school network (Sánchez, 2018[49]; Radinger et al., 2018[50]).

Box 2.5. Contracting private providers to address acute capacity shortages in Colombia

When faced with capacity shortages or other limitations, Colombia's Secretaries of Education (sub-national authorities at the departmental or municipal level that have been certified to provide education and are referred to as certified territorial entities) can provide education through different forms of partnerships with private providers (*matrícula oficial contratada*). Regulated by Decree 1851 of 2015, these partnerships most commonly take the form of publicly funding privately operated schools under the supervision of the Secretaries of Education. Overall, around 6% of students from pre-primary to upper secondary education were enrolled in publicly funded private schools and 19% in independent private schools in 2017 (Sánchez, 2018). Based on PISA 2015 data, the share of 15-year-old students attending government-dependent or independent private schools in Colombia stood at 24.1% compared to the OECD average of 19.1% (OECD, 2016[51]).

The contracting of private providers can take different forms and is conditional on the local authorities' proven inability to supply sufficient school places to meet educational demand. Most commonly, local authorities hire the owners of private schools from a regulated database of recognised suppliers on the basis of single-year contracts that encompass both personnel and facilities. Private school providers can also be contracted through a selective process via tender to take over the management of existing public school facilities for a period of 2-12 years. Furthermore, churches and other religious entities can be engaged to provide educational services on single-year contracts and certified municipalities with more than 300 000 inhabitants can provide vouchers for low-income students to attend independent private schools.

The limited-term contracts on which most publicly funded private provision is based has allowed authorities to quickly scale back their reliance on private schools when enrolment started to drop or to assume the responsibility themselves where demand for facilities and staff was expected to remain high. A drawback of the flexibility afforded by these short-term contracts is the insecurity it entails for private partners, which makes it difficult for them to establish high-quality educational projects over a longer period of time (Radinger et al., 2018).

These public-private partnerships were important for Colombia's ability to respond to rising enrolment in urban areas driven by rural-urban migration and students displaced from conflict zones. They also helped to guarantee the provision of specialised education to indigenous students and mandatory services for students with SEN where local authorities did not have the capacity to adequately provide them on their own. At the same time, the quality of education provided by private entities is highly variable and not all local authorities have adequate capacity to monitor their quality. In recent years, the government has promoted the reduction of the use of private providers (Radinger et al., 2018).

Sources: Sánchez, J. L., (2018), *OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools: Country Background Report for Colombia*, Ministerio de Educación Nacional [National Ministry of Education], Bogotá, D.C; Radinger, T., A. Echazarra, A., G. Guerrero & J. P. Valenzuela (2018), *OECD Reviews of School Resources: Colombia 2018*, OECD Publishing, Paris.

Examples of needs-based criteria for the creation of new schools can also be found in the vocational education sector. In Estonia, for example, vocational school owners are required to submit a justification for their choice of programmes as part of their schools' licensing process (Santiago et al., 2016, p. 73[14]). This includes submitting the written views of social partners on the programmes proposed and – since the abolition of county Governors with the administrative reform in 2017 – a written statement from the union of local municipalities. Yet, whether in general or vocational education, the implementation of needs-based licensing systems involves several challenges, including the specification of adequate and transparent criteria, their reliable measurement and the development of capacity among school authorisers to carry out the associated assessments.

School choice and residence-based assignment mechanisms

The mechanisms by which students are assigned to or given the opportunity to choose their school affect how the demand for school places is distributed across the network. The choice of assignment procedures is an important factor in determining the extent to which the school network should be governed by market-based mechanisms and may involve trade-offs between competing policy goals. While residence-based student assignment mechanisms are a straightforward and predictable way to ensure that students can attend a school close to where they live, they have been criticised for reproducing residential segregation and compelling students from disadvantaged neighbourhoods to attend under-resourced or low-performing local schools. Systems involving parental choice, by contrast, promise to break the link between students' education and their place of residence but are often charged with reproducing inequities by virtue of the different ways in which families across the socio-economic spectrum can exercise their right to school choice.

Particularly for younger students, the majority of OECD school systems combine some form of initial geographic assignment process with varying degrees of parental choice (Musset, 2012[52]). In 2009, primary and lower secondary students are initially assigned to a proximate neighbourhood school in 27 of 33 OECD countries with available data, compared to just half of OECD countries at the upper secondary level (OECD, 2011, pp. 440, Table D5.12 [web][53]). This initial assignment is often based on catchment areas that determine the residents who are eligible or encouraged to attend a specific school. In most cases, parents then have the possibility to submit a request for their child to attend a different public school following this initial assignment, which may be granted subject to the availability of places, the schools' proximity, the presence of siblings, specific educational reasons and various other criteria. Particularly in decentralised education systems, the modalities of this assignment process can vary from one local authority to the next. Some systems also dispense with the initial assignment process altogether and prompt all parents to apply to a primary or lower secondary school of their choice or to submit a list of preferences from the very start.

In Austria, for example, some cities and regions have responded to demands from families by loosening their system of strict geographic assignment. When enrolling their child in an academic upper secondary school (*Allgemein bildende höhere Schule*), families can now freely choose from all schools of their province. Where demand exceeds supply, students can be assigned to another academic secondary school based on their distance to the school, siblings enrolled, their ability, or – depending on provincial regulations – the parents' second or third preference. In general compulsory education, students are traditionally assigned to their local school based on catchment areas and, if they comprise multiple schools, based on additional criteria depending on the province's

regulations, such as their distance from the school or the presence of previously enrolled siblings. While the city of Linz has now entirely abolished the initial assignment based on catchment areas, Vienna has expanded them to include not only the school's municipality, but also its neighbouring districts. Parents are free to select any school within their catchment area and request permission from the concerned authorities to enrol their children in a different district or municipality since such transfers require local municipalities to send compensation payments to the receiving authority. Schools offering specialised curricula, such as music or sports, are exempt from the catchment area principle. While the expansion of parental choice and school autonomy in Austria since the 1990s has motivated some schools to sharpen their profiles and develop pedagogical priorities to attract high-achieving students, authorities have sought to prevent student segregation dynamics by withholding disaggregated school assessment results or other forms of rankings (Nusche et al., 2016, p. 123[17]).

Even in systems that do not conduct an initial residence-based assignment, students' choice of schools can be constrained by the commuting distance they are willing to accept. In addition, many oversubscribed schools prioritise students who live nearby or whose siblings are already enrolled (Musset, 2012[52]). These criteria are sensible means to ensure that students can attend schools close to their home and parents with multiple children can easily drop them off or pick them up. Nevertheless, concerns have been raised that residence-based priority lists can reproduce residential segregation in the school system, effectively excluding disadvantaged students from popular schools in more affluent neighbourhoods. For this reason, a 2000 reform in Stockholm abolished residential proximity as an admissions criterion for oversubscribed secondary schools and instead assigned all places strictly based on students' grades. Yet, the case of Stockholm demonstrates that replacing residency with other selection criteria or expanding parental choice (discussed in detail below) is not guaranteed to reduce segregation on its own. As expected, the reform led to a marked increase in between-school segregation by ability (Bygren, 2016[54]) and earlier evaluations also found a significant increase in socio-economic and ethnic segregation, beyond what would have been expected based on students' grades alone (Söderström and Uusitalo, 2010[55]).

School choice schemes can exacerbate inequities if not carefully designed

Proponents argue that parental choice in the student assignment process incentivises schools to compete for students with an attractive pedagogical offer and yields a distribution of students that more closely reflects their educational preferences. Parental choice, at least in theory, also provides disadvantaged students with an opportunity to attend high-quality schools that would have otherwise been restricted to those who can afford living in or moving to attractive school districts. Even though school choice schemes in the majority of OECD countries only apply to the public sector, some have used extended parental choice to include the attendance of selected private providers based on similar arguments. These reforms are frequently implemented through voucher schemes that permit students to carry their funding from the public into the private sector (Musset, 2012[52]).

In practice, many countries' school choice systems have exacerbated socio-economic segregation across schools, rather than widening access to high-quality schools and there is little evidence that increased competition benefits those who fail to take advantage of school choice (Musset, 2012[52]). In contrast to systems with a strictly geographical assignment, those with a high degree of school choice are affected by socio-economic differences in parents' behaviour, related to both their likelihood to make use of school

choice and the criteria upon which they base their decisions. School choice arrangements that fail to take these social and behavioural variations into account and effectively address them are therefore at risk of reproducing or exacerbating the inequities they were designed to redress.

When selecting a school, most families have a preference for high academic standards, alongside other factors, such as a school's distance or socio-economic composition. There have been concerns, however, that the weight parents place on different criteria when engaging in school choice might vary across socio-economic groups, leading to some families systematically choosing better performing schools than others. Although some of this variation arises from differences in the quality of accessible schools rather than parents' actual preferences, advantaged parents do appear to value academic performance more than others (Burgess et al., 2015[56]; Hastings, Kane and Staiger, 2005[57]). This variation in parental preferences is a concern, not only because it means that school choice may systematically lead disadvantaged students towards lower-achieving schools, but also because it implies that schools have fewer incentives to compete on the basis of educational quality than proponents of parental choice might expect.

Evidence from school choice systems in multiple countries also shows that the disadvantaged families for whom many school choice schemes were originally introduced are the least likely to take advantage of them. Wherever the exercise of school choice is optional, rather than the default, i.e. where students are initially assigned to a local school, the group most consistently found to exercise choice are those with comparatively high social, cultural and economic resources. Native parents have also been shown to more frequently opt out of local schools with a high concentration of migrant students, causing dynamics of "native flight" that reinforce ethnic segregation (Rangvid, 2010[58]). Even choice schemes that are narrowly targeted at disadvantaged families tend to benefit those among them with the greatest academic ambitions and the most resources at their disposal (Musset, 2012[52]). This can be due to greater efforts among advantaged families to pull out of disadvantaged schools or due to the difficulties that low-income and minority families face in navigating the school choice process (Ladd and Fiske, 2001[59]). Giving individual providers discretion over their application and registration procedures can lead to indirect "cream skimming" practices and exacerbate differential participation rates, for example if disadvantaged families fail to submit their choices for the most popular schools early on (Musset, 2012[52]). Some of these barriers can be reduced by making deadlines, admissions and enrolment procedures homogenous across schools, by raising awareness of school choice options and by supporting disadvantaged families in navigating the process effectively (Nusche, 2009[60]; OECD, 2012[61]).

Even where disadvantaged families engage in the school choice process, they often lack the strategic sophistication and the relevant, contextualised information on school quality that they need to make the most of their choice (Schneider, Teske and Marschall, 2000[62]). Disadvantaged families may lack the resources, time and social capital to acquire sufficient information when exercising school choice and language barriers or a lack of familiarity with the school system can be an additional obstacle for migrant parents (Nusche, 2009[60]). For school choice to be effective, public institutions must address these barriers by expanding access to information and minimising the cost of its acquisition (OECD, 2012[61]), which also involves making it available in selected foreign languages and accessible to parents with limited literacy (OECD, 2010[63]). Whether countries decide to publish school-level performance indicators or withhold this information to avoid further segregation, it is important to recognise that raw performance

data is difficult to interpret and that contextualised value-added measures should be strictly preferred (Musset, 2012[52]).

Furthermore, most choice-based assignment procedures are susceptible to strategic manipulation, in the sense that they incentivise families to misreport their true school preferences, for example by avoiding submitting a preference for oversubscribed schools. Evidence from a common, ranking-based school choice system in the United States suggests that students engaging in strategic manipulation were more likely to be assigned to one of their preferred schools. This form of manipulability not only lowers the overall match-quality of school assignments, but may also implicitly discriminate against students and families who lack the knowledge, time or resources to appropriately respond to the complex incentives for strategic manipulation (Dur, Hammond and Morrill, 2018[64]). School systems have taken different complementary measures to ameliorate this problem. These include expanding the availability and accessibility of information on the quality of schools and the school choice process itself to enable parents to pick whatever school would serve their children best without requiring extensive research and upfront-investments. A parallel strategy has been to ensure school choice systems do not reward strategic manipulation, for example with the implementation of strategy-proof Deferred Acceptance Algorithms in New York in 2004, and Boston in 2006 (Roth, 2008[65]).

Policy makers have also turned to various types of "controlled choice" systems that combine some degree of parental choice with mechanisms to ensure that the advantages of school choice accrue to families across the socio-economic spectrum (Brunello and De Paola, 2017[66]; Nusche, 2009[60]). This commonly involves parents reporting several school preferences to a central enrolment point, which public authorities then try to respect as much as possible while maintaining a balanced distribution of students. This can be based on schools adopting quotas pertaining to characteristics such as SES, parental income and educational background, geographic area and other household characteristics. Controlled choice systems may also restrict which admissions criteria oversubscribed schools are permitted to take into account when selecting their incoming cohort of students or require them to assign places randomly among applicants using a lottery system to prevent the exclusion of disadvantaged students (Karsten, 2010[67]).

The Flemish and French Communities of Belgium provide two recent examples of school systems with a strong tradition of parental choice that have reformed their enrolment policies and introduced different elements of controlled choice (see Box 2.6). In both systems, free and largely uncontrolled parental choice at the primary and secondary levels, had contributed to a high level of social and ethnic school segregation which they have sought to address over the course of the past decade (OECD, 2015, p. 73[68]). An important feature of the Flemish Community's reform was its scope for flexibility at the local level, based on the extensive use of consultations, which significantly reduced resistance to its implementation. Given the complexity of controlled choice systems, their successful introduction may also require a certain degree of centralisation to minimise administrative costs and prevent problems like multiple registrations from generating inefficiencies (Musset, 2012[52]). The implementation of controlled choice systems also requires sufficient juridical and administrative capacity for the responsible authority to collect and manage the data needed to allocate students to schools (Karsten, 2010[67]).

Box 2.6. Controlled choice reforms in the Belgian Communities

Since passing the 2002 Decree on Equal Educational Opportunities, the **Flemish Community of Belgium** has implemented a series of reforms to its school choice system. Following a two-year period between 2008 and 2010, which permitted local experimentation to test out different enrolment systems, a 2011 Decree took stock of the lessons learned and introduced a number of reforms to the controlled choice system. First applied in 2012-13 (and subsequently adjusted) to admissions in all pre-primary, primary and secondary schools, the reform required oversubscribed schools to assign places to disadvantaged and non-disadvantaged students in proportion to the socioeconomic composition of each school's neighbourhood. The reform also defined the criteria that schools could draw on to choose among students within each group when demand for places exceeded supply. Pre-primary and primary schools were allowed to consider the distance between the parents' home or workplace and the school, the position of the school in the student's rank order list, or the results of a lottery. Secondary schools were required to operate on a first-come-first-served basis or to make decisions based on the position of the school in the student's rank order list. Many elements of the reforms' implementation were decentralised and assigned to local negotiating platforms (*locale overlegplatformen*, LOPs). LOPs decided on matters such as the definition of neighbourhoods and the quotas for disadvantaged students, which helped to reduce local resistance to the new rules. By 2013, there were 72 LOPs covering most of the territory of the Flemish Community, each of which ensured the co-operation between schools, stakeholders and a defined local authority or region, bringing together representatives of the main educational stakeholder groups in that area.

The **French Community of Belgium** reformed its parental choice system starting in 2007 and enrolment in the first year of secondary education has been subject to a 20% quota for disadvantaged students in every school since 2010-11. Enrolment at the pre-primary and primary levels remains largely unregulated. Other than in the Flemish Community, the reform did not provide scope for adjustments at the local level and adaptations to a school's neighbourhood characteristics, which may help to explain the relatively strong resistance by schools and other stakeholders. The identification of disadvantaged students was also rather imprecise and based on the average SES of their primary school, which in turn was defined on the basis of the schools' residence area.

Sources: Nusche et al. (2015), *OECD Reviews of School Resources: Flemish Community of Belgium 2015*, OECD Publishing, Paris, http://doi.org/10.1787/9789264247598-en; OECD (2015); *OECD Economic Surveys: Belgium 2015*, OECD Publishing, Paris, http://doi.org/10.1787/eco_surveys-bel-2015-en.

The definition of catchment areas is an important steering tool in the governance of student assignment

The definition of school catchment areas is an important tool in the governance of the school network and student assignment. Whether the residence-based assignment to a school is mandatory or merely the first step in a process of parental choice, the size and boundaries of catchment areas can have a significant effect on the distribution of students.

Catchment areas are often defined along administrative boundaries but can vary significantly in size, ranging from those containing a single neighbourhood school to those encompassing an entire city's school network. In countries that restrict students' enrolment to schools within their local catchment area, expanding their size can be an indirect way to increase parental choice. In the Austrian capital Vienna, for example, a school's catchment area includes both its own and the neighbouring district (Nusche et al., 2016, p. 123[17]). Furthermore, drawing catchment areas that integrate advantaged and disadvantaged neighbourhoods can be a means to increase diversity in socially segregated schools networks (Karsten, 2010[67]).

In some countries, such as Austria, catchment areas also define the funding obligations of local authorities, which are required to compensate adjacent municipalities for students attending schools outside their jurisdiction. Particularly where the efficient organisation of the school network requires a rationalisation of school facilities, such funding arrangements can create disincentives for small municipalities to engage in school consolidation or share facilities. In this context, the expansion of rural catchment areas beyond municipal boundaries can be an important step to initiate a reorganisation of the school network since multi-municipality catchment areas could permit authorities to rationally decide which schools should be kept open without the threat of immediate budgetary consequences for individual municipalities (Nusche et al., 2016, p. 140[17]).

School catchment areas are regularly adjusted, for example in response to new school openings and closures, to account for housing developments or population declines, to increase their socio-demographic diversity, to implement new school choice programmes, or to adjust to new grade configuration models. In most cases, catchment areas are defined by local authorities and given the significant impact that re-zoning processes can have on local communities, giving them a voice in the final decision is important to find suitable solutions and ease the implementation process. National or regional authorities can, however, play a critical role in supporting local actors in their definition of catchment areas, for example by providing them with technical tools and data on student enrolment patterns, school performance or estimates of the cost and benefits associated with different boundaries (OECD, 2011[69]).

Some authorities have taken advantage of geographic information systems (GIS) when re-drawing catchment areas to conduct spatial analyses of factors such as students' travel times under different scenarios. Since GIS applications require significant expertise and resources, they often rely on a division of labour between central and local authorities, which can create tensions between a commitment to decentralised control over catchment areas and the centralised capacity for their implementation (Hite, 2011, p. 215[70]). Well-designed GIS tools can draw on the technical capacity of central-level staff for the collection and manipulation of data or the production of easy-to-use maps and analyses, while drawing on the contextualised knowledge of local administrators, teachers, and community members to adjusting the products to their needs (Hite, 2011, p. 224 f.[70]).

Monitoring the school network and forecasting educational demand

Monitoring and forecasting mechanisms play a vital role in creating the conditions for school networks to effectively respond to changing student needs and educational demand. Collecting and disseminating information on the current supply of school places, the quality of facilities and expected demand is crucial to steer the actions of authorities at all levels of the school system and enable them to contribute to the sustainable governance of the school network.

Monitoring the supply of school places

Effectively aligning supply and demand for school places and planning the network accordingly requires a thorough understanding of both the current stock of educational facilities and the changing demand for school places. The strategic planning of school infrastructure developments therefore relies on effective monitoring and forecasting mechanisms that support a system-wide approach with high-quality data. They can inform decisions about specific investments and priorities and help policy makers in assessing the scope and feasibility of efficiency-enhancing interventions, inter-school collaboration, consolidation or the expansion and construction of new facilities.

High-quality inventories providing centralised information on educational facilities, their characteristics and capacity can provide invaluable information to support planning activities at the local and central levels. Aggregating micro-level data on the capacity of individual facilities in geographically oriented databases and combining it with corresponding enrolment forecasts can help authorities to detect priority areas in need of additional school places and those with excess capacity. Collecting and managing this data can also provide a basis to explore opportunities for synergies such as the sharing of facilities or the creation of school clusters and to simulate the expected effects of reforms such as grade reconfigurations on enrolment patterns across multiple sites (Beynon, 1997, p. 62[8]). The Czech Republic's school registry provides an example of an administrative tool that comprises a comprehensive listing of capacities across different educational fields, which could be used to perform the aforementioned operations (see Box 2.7).

During the OECD review visit in 2015, representatives from the Flemish Community school network reported to developing capacity to map out the school provision and infrastructure based on strategic plans for each of the Flemish Community's school groups (school boards, responsible for multiple schools), as well as monitoring and projecting relevant indicators related to demographic trends and local infrastructure. The intention is to encourage school leaders and school group directors to make strategic choices, plan ahead for future needs and set priorities that take the entire area into account. This also involves investing in an information system that includes data on all facilities and their associated infrastructure (Nusche et al., 2015, p. 125[9]). The French Community of Belgium has adopted a similar strategy to detect and address capacity shortages in its metropolitan areas. As described in Chapter 3 (Box 3.11), the four-stage process includes consulting the surface area and student numbers of each school, as documented in an inventory. Next, it involves on-site visits and the deployment of working groups to institutions with significant over- or under-capacity to analyse whether a reorganisation of their premises could yield a more efficient use of space (Smoos, 2017[71]). However, particularly in systems where the provision of school places is governed by different and overlapping networks and diverse independent providers, gathering system-wide data to identify discrepancies between the demand and supply of school places constitutes a significant challenge (Nusche et al., 2015, pp. 115, 124 f.[9]).

Box 2.7. Monitoring the school network in the Czech Republic

In the Czech Republic, any school seeking public funding and official recognition as a certificate-granting institution is required to be included in the country's School Registry of Schools and School Facilities (hereinafter "school registry"). The Ministry of Education, Youth and Sports (*Ministerstvo školství, mládeže a tělovýchovy*, MŠMT) is in charge of the school registry, although regional authorities share some responsibility for the entry and maintenance of data and the approval of schools entering or being removed from the school registry (MŠMT, 2016, p. 16[48]). In addition to confirming its schools' recognition, the registry serves as an administrative tool to monitor the school network. Subject to systematic evaluation from the education inspectorate, the school registry contains a comprehensive list of all facilities managed by the three major school providers and their respective capacities: public schools established by the ministry or regional governments, church schools and private schools. This use of a single registry gives the central authority a relatively high degree of oversight in an otherwise very decentralised school system (Shewbridge et al., 2016, pp. 66, 83).

Despite the school registry's potential to support the strategic organisation of the school network, its use as a planning and steering tool is currently limited. Combined with regionally disaggregated data and forecasts of future demographic developments, the school registry could be used to systematically identify discrepancies between projected network capacities and educational demand at different levels of the school system. This could also guide the development of principles for the reorganisation of the school network, including rules for the opening of new schools or new educational programmes. Yet, even in areas with identified excess capacity, the legislative framework limits the Ministry of Education's ability to decline a school's bid to join the registry, for example if an application enjoys the support of regional authorities. This, alongside the challenge of maintaining data once it has been entered into the registry, has thus far limited its use as a tool to steer the organisation of the school network.

Sources: MŠMT (2016), *OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools: Country Background Report for the Czech Republic*, Czech Ministry of Education, Youth and Sports, Prague; Shewbridge, C., et al. (2016), *OECD Reviews of School Resources: Czech Republic 2016*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264262379-en.

Monitoring and evaluating the quality of school facilities and infrastructural investment needs in the school network

Efforts to monitor the school network and generate inventories of an education system's infrastructure stock can extend beyond the quantity of buildings and learning spaces to include their qualitative characteristics and condition. This information can provide the basis for identifying investment priorities and forecasting construction or maintenance needs. In some countries, this data is generated on an ad hoc basis, while others collect it in regular intervals or as part of post-occupancy evaluations following the completion of construction projects. As discussed in Chapter 1, adequate school facilities are an important part of students' learning environment and investing in the school network's infrastructure can have a positive impact on teachers, learners and the wider community (Cellini, Ferreira and Rothstein, 2010[72]; Conlin and Thompson, 2017[73]). Meta-analyses have found particularly young students to be susceptible to the quality of their school

buildings (Gunter and Shao, 2016[74]). In addition to maintaining school buildings in an adequate physical condition, identifying and responding to infrastructural investment needs also plays an important role in enhancing educational practices by creating the conditions for the introduction of new and improved pedagogical techniques.

Ad hoc comprehensive reviews

Comprehensive reviews of school facilities, their quality and investment needs are usually conducted leading up to major reforms or infrastructure projects. During the initial phase of its large-scale Secondary School Building Modernisation Programme (SMP), for example, Portugal launched a comprehensive survey of its secondary schools to determine which schools should benefit from infrastructural investments, taking into account the schools' age, condition and other characteristics. A detailed technical analysis provided further insight into the types of school buildings whose life could be considerably extended through renovation works and those that would benefit more from replacement than refurbishment (in practice, this tended to be the case for newer schools built with lower-quality materials). This comprehensive review and analysis of school facilities provided the basis for the effective prioritisation of funds and – in co-operation with regional authorities – the selection of schools for the different phases of the project (Blyth et al., 2012, p. 20[6]).

Regular comprehensive reviews

In contrast to ad hoc review, the regular evaluation of the school network and its building stock can allow policy makers and stakeholders to track progress over time, fostering both transparency and accountability. The AGIOn's monitoring survey in the Flemish Community of Belgium provides an example of such regular monitoring instruments. Since 2008, the Flemish school building monitor has been carried out at the end of every government term (the second was conducted in 2013), collecting statistical data on all schools via an online survey asking school principals to assess their facilities based on a wide range of quality indicators (Flemish Ministry of Education and Training, 2015, p. 57[75]). The 2008 survey of the Flemish school network, for example, brought to light that school buildings at 32% of all sites were considered too small to accommodate necessary facilities, especially in the capital region (Leemans and von Ahlefeld, 2013[5]). Similar reviews are regularly conducted in Austria as part of its federal school investment and infrastructure planning process (Nusche et al., 2016, p. 129[17]).

Post-occupancy evaluation techniques

Post-occupancy evaluation (POE) techniques constitute an important complement to large-scale reviews of the school network, assessing the adequacy of school facilities once a construction project is completed and its facilities are in use. In addition to ensuring the technical adequacy of infrastructural works and fulfilment of contractual obligations, POE techniques generate important information on the facilities' ability to meet teachers' and students' needs in practice and thereby provide a basis to identify problems, initiate necessary adjustments and inform the planning of future construction projects elsewhere. Although they are usually carried out locally, central governments can facilitate the process and help schools to develop the instruments they need to evaluate facilities upon completion (Leemans and von Ahlefeld, 2013[5]).

Monitoring and forecasting developments in educational demand

Amid growing concerns surrounding the efficiency of their school networks, many countries are increasing their efforts to identify discrepancies between educational supply and demand. Developing indicators of underutilisation or infrastructural shortages based on student enrolment and school capacity data can be an effective means to detect mismatches in the current supply and demand for school places. Some countries also use capacity data and indicators such as average class size and occupancy rates when selecting priority areas for investigation or initiating automatic review procedures, as described in Box 2.8. While these techniques are primarily geared to detect shortcomings in the present stock of schools and school places, other techniques aim to identify these challenges before they arise.

Accurate forecasts of educational demand are critical for countries to anticipate infrastructural needs, determine the appropriate size for newly constructed or renovated schools, guide the distribution of capital funding and ensure that the school network can accommodate educational demand for the foreseeable future. While aggregate projections of educational needs can support the system-wide planning of school facilities and expenditure frameworks at the national level, more fine-grained and disaggregated forecasts can support school network planning activities at the regional level and even contribute to micro-planning and school network management at the local level. Depending on the distribution of responsibilities, these disaggregated projections may be integrated into the central-level forecasting activities or carried out by regional offices and sub-central authorities.

Box 2.8. Examples of automatic network review processes in the United Kingdom

In **Scotland**, the Scottish Borders Council developed a set of criteria that initiate automatic reviews of schools. These include: a reduction in the school's number of required teachers; cohorts that are forecast to fall below 13 students over the next three years; operating cost exceeding three times the local authority's average; occupancy levels below 45%; a significant decline in student performance; urgent investment needs that are considered disproportionate (Commission on the Delivery of Rural Education (CDRE), 2013[76]). The ensuing review process does not necessarily result in the closure or consolidation of small schools, but it may create pressure and incentives leading to consolidation later on. For example, repeated reviews have been reported to dissuade parents from sending their children to a school, which has sometimes caused a further decline in enrolment rates, thereby triggering a vicious circle.

In **Wales**, a third of primary schools have fewer than 90 students, and 15% of them have fewer than 50 students. During recent years, the Welsh Assembly Government has therefore put increasing pressure on Local Education Authorities to address the issue of excess capacity (Rural Development Sub-Committee, 2008[77]). Local authorities have been ordered to monitor their school networks and pay particular attention to: primary schools with fewer than four teachers, year groups regularly containing less than eight to ten students, head teachers with substantial teaching loads, mixed age classes containing more than two year groups, or schools with more than 25% surplus places [Evans, 2005, in (Sigsworth and Solstad, 2005[18])].

Source: 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.

In addition to baseline data on student populations, current capacity, equipment or staff, forecasts of educational demand depend on a range of predictive assumptions concerning student enrolment and flow rates, student-teacher ratios, class sizes, utilisation rates of facilities etc. Based on a series of such variables, simulation models can serve to project expected student numbers, classes or classrooms, personnel and facility needs at different levels of aggregation (UNESCO, 2012[78]). Depending on the granularity of the desired estimates and the model's sophistication, forecasting exercises may rely on existing administrative data or require the collection and processing of additional information from various sources.

Since policy changes such as an increase in the school leaving age have a significant impact on the size of future student cohorts, reliably projecting educational demand and the associated infrastructural needs relies not only on accurate demographic projections but also on the evaluation of ongoing developments in educational policy. Likewise, curricular developments such as a move towards the use of ICT or personalised and laboratory-based teaching methods often require the expansion or adjustment of educational facilities. Capacity forecasts and simulations can inform policy dialogues around such reforms, facilitate negotiations and promote consensus among stakeholders. As administrative working tools, they can also foster transparency in resource management decisions and support the implementation of costed sector plans (UNESCO, 2012[78]) or complement pilots to simulate the impact of policy options under multiple scenarios.

Especially in countries that do not have an established culture of using projections to support educational planning, generic simulation models have played an important role in advancing national forecasting capacities. The EPSSim (Education Policy and Strategy Simulation Model) (developed by UNESCO in 2001 and updated since) is one example designed to support national administrations in formulating education development plans. It helps them in identifying resources and actions required under different scenarios and testing the viability of different strategic responses. Building on core components that are applicable across school systems, such as a basic student flow simulation, the model integrates a number of optional elements that allow administrations to approximate features of their local and national contexts and adapt the tool to their specific needs (UNESCO, 2012[78]). Although basic generalised simulation models are easily accessible to national education planners, adapting and using them to develop reliable medium to long-term plans requires resources and technical expertise. Fostering a successful "culture of projecting" might therefore require capacity building for the use of existing simulation models, their modification and the analysis of projection results (Bray and Varghese, 2011[79]).

2.3. Network planning at the regional and local levels

In many OECD school systems, decentralisation and the increased autonomy of local authorities, school boards and schools have changed the context in which the organisation of the school network takes place. At the same time, parents, students and communities have become more diverse, educated and empowered to demand schools to cater to students' individual needs (Burns and Köster, 2016[80]). While decentralisation is typically expected to increase responsiveness to the demands of local communities, raise the potential for innovation and adapt the use of resources to local conditions, it can also raise challenges for the equitable and efficient management of resources (OECD, 2017[2]). For example, small municipalities may lack the capacity to effectively plan their school

networks and manage their facilities so as to ensure high-quality learning environments for their students. Systems with fragmented governance structures in which many local authorities are responsible for a single school may also face difficulties to attain size efficiency, particularly in a context of falling student enrolment. Enabling locally governed school networks to provide a high-quality educational offer that responds to all students' needs is a significant challenge that requires all levels of government to work together.

It is clear that highly centralised systems are not necessarily better placed when it comes to the challenge of adjusting school networks to changing demand or student needs. Countries such as Serbia, that did not undergo a process of decentralisation and in which the national government remains responsible for both the school network and teacher employment have had an even harder time adjusting to demographic shifts than countries like Estonia, which devolved network planning competencies to the local level (Santiago et al., 2016, p. 152[14]). Likewise, there are many examples of systems that successfully carried out efficiency-enhancing reforms without strong central-level involvement. This was the case in Denmark, where municipalities independently advanced the consolidation of their school networks in order to generate economies of scale, reduce expenditures at the lower secondary level through larger school sizes and increase student achievement by improving the learning environment in the process (Nusche et al., 2016, p. 81[19]).

The Czech Republic provides another example of a decentralised system that proved capable of adjusting their school network in the face of demographic pressures. Particularly in the early years of declining student enrolment, the number of teaching staff has largely kept pace with this trend in both the municipal and the regional school networks. Some conditions which facilitated this responsiveness included a clear distribution of responsibilities, with municipalities operating most pre-primary, primary and lower secondary schools and the regions mostly operating upper secondary schools. Furthermore, the central per capita funding system provides some incentives for school consolidation. Finally, the possibility to operate different kinds of schools and facilities as a single legal entity has encouraged modular approaches to school consolidation based on the reallocation of services across facilities (Shewbridge et al., 2016, p. 68[15]). Beyond contextual particularities, the success of local planning initiatives and school network governance appears to be contingent on a number of conditions, including adequate local capacity, responsible authorities of sufficient size and effective co-ordination mechanisms between them.

Capacity for strategic planning at the sub-central level

Depending on a school system's degree of decentralisation and local autonomy, schools and municipalities may assume significant responsibilities for planning the local school network and managing or maintaining school facilities. In order to perform these tasks successfully, the responsible sub-central actors require not only adequate capacity, but also clear leadership and a focus on educational quality (Shewbridge et al., 2016, p. 62[81]). As described before, successfully anticipating discrepancies between the supply and demand of school places and planning the school network accordingly involves a diverse range of activities, many of which require technical skills, such as the collection, management and analysis of relevant data (OECD, 2017, p. 137[2]). Small municipalities often have few dedicated staff members working on matters concerning education, and local authorities in recently decentralised systems may lack the experience to engage in strategic thinking and effective network planning.

The case of Estonia illustrates the importance of building local capacity for the success of school network governance in decentralised systems. While local governments in Estonia had been assigned responsibility for key decisions concerning school reorganisations, closures and mergers, most of the information and administrative capacity was retained by the central government, making it difficult, particularly for smaller municipalities, to effectively exercise their new role (Santiago et al., 2016, p. 93[14]). As highlighted by the OECD review team, the professionalisation of local management depends not only on the capacity of local actors themselves, but also on the institutional settings in which they operate. This includes their access to information and professional support, as well as mechanisms to monitor and provide feedback on the work of municipalities and their services (Santiago et al., 2016, p. 103[14]).

Different forms of horizontal capacity building and structures based on distributed leadership can complement these approaches to improve the organisation of school networks in decentralised education systems. Multiple case studies conducted as part of the OECD's Governing Complex Education Systems project, for example, demonstrated that collaboration and the exchange of good practices can have a very positive impact on the capacity of municipalities, schools and professionals (Burns, Köster and Fuster, 2016[82]). Another strategy to co-ordinate the actions of local authorities in decentralised systems and enable them to engage in long-term strategic thinking is to build "guiding coalitions" of leaders at different levels of the system (Rouw et al., 2016, p. 57[10]). Such coalitions have the potential to develop a shared agenda for the whole-system implementation of school network reforms and harmonise the actions of stakeholders in the absence of formally centralised control.

Horizontal co-ordination for effective network planning

Even at times when the importance of adapting the school network is widely recognised among stakeholders, a lack of incentives or structures for collaboration can render its reorganisation difficult in decentralised systems. Particularly in those with a fragmented governance structure and a high number of small municipalities operating only a few or a single school (as is the case in countries like Austria and the Slovak Republic), local administrators can feel pressured to keep small schools open despite their high costs and potentially inadequate educational provision. In the absence of effective co-ordination among nearby municipalities, they often fail to seize opportunities for collaboration or the joint provision of services despite their potential to reduce costs and improve the learning experience of students.

This section describes two ways in which school systems have sought to address this problem: through governance structures that foster horizontal co-ordination at the local level, and through arrangements between the central and the local level that seek to bring a system-wide dimension to the decentralised governance of the school network. While many countries with a long tradition of decentralised governance have overcome co-ordination challenges and managed to facilitate the rational organisation of the school network across administrative boundaries using one or both of these approaches, others have yet to adapt to the challenges posed by a new governance context (Santiago et al., 2016, p. 83[14]).

Local co-operation, co-decision mechanisms and the pooling of administrative capacities

Successful local co-operation on matters like the co-management of schools, the shared use of facilities, transportation services, school maintenance or joint purchasing depends on governance structures that facilitate horizontal collaboration and decision making. In the absence of institutionalised mechanisms, strong central level support or financial incentives, these forms of co-operation often depend on historical ties and informal relations between decision makers in different municipalities (OECD, 2011, p. 248 f.[69]).

While local capacity building should be a priority in decentralised systems, collaboration across municipalities or schools and the pooling of administrative resources can complement these efforts and improve schools' ability to effectively plan their school networks. This can involve informal forms of exchange to identify and spread good practices or more formal collaboration. For example, groups of municipalities could share management resources by jointly employing and drawing on the services of specialised staff, share relevant data or engage in the collective planning of their school networks. In systems where the challenges of local authorities are too profound to be addressed through traditional capacity building or sharing administrative resources alone, some countries have engaged in the de facto consolidation of municipal authorities to generate administrative economies of scale and improve the efficient delivery of the entire array of local public services. Box 2.9 provides examples of two such approaches to enhancing local capacity through collaboration in Norway and administrative consolidation in Denmark.

Central-level authorities can promote horizontal co-operation and co-decision mechanisms at the sub-central level in a number of ways, ranging from the provision of guidance and incentives to the enforcement of rules that require collaboration under specific circumstances (OECD, 2011[69]). In the Netherlands, for example, the Law on Mutual Agreements regulates the co-operation between municipalities, provinces and other sub-central public bodies. While their co-operation is voluntary in principle, the national government can force sub-central authorities to collaborate on a well-defined project of particular importance under certain conditions (Charbit and Michalun, 2009[83]). Some central-level authorities have also prompted municipal co-operation by expanding catchment areas and putting a single provider (for example a larger municipality or an association of municipalities) in charge of administering the enlarged school network. Depending on their role within a given governance context, school principals can also be key actors driving local-level collaboration in the organisation of the school network. Platforms that foster a regular and constructive exchange between school leaders can promote peer learning while simultaneously strengthening the basis for inter-school collaborations (Santiago et al., 2016, p. 210[84]).

Box 2.9. Addressing a lack of administrative capacity through collaboration and consolidation

Peer-learning networks in Norway

In Norway, municipal quality networks provided a platform for local authorities to engage in peer-learning and pool administrative capacity as a means to fulfil their responsibility for the school network in a highly decentralised system with a strong sense of respect for local ownership. In this context, a range of networks, partnerships and local collaboration initiatives have been established to take collective responsibility for quality evaluation and improvement. For example, in 2002, the Association of Local and Regional Authorities (*Kommunesektorens interesse- og arbeidsgiverorganisasjon*, KS), the Ministry of Labour and Government Administration, and the Ministry of Local Government and Regional Development set up "municipal networks for efficiency and improvement" that offer quality monitoring tools for municipal use and provide a platform for municipalities to share their experience, compare data and evaluate different ways of delivering services across a range of sectors. For the education sector, an agreement was established between KS and the Directorate for Education and Training to allow the networks to use results from the user surveys that are part of the national quality assessment system (Nusche et al., 2011[85]).

Administrative consolidation in Denmark

As part of a Local Government Reform in 2007, Denmark reduced the number of its municipalities from 271 to 98 and replaced 14 counties with five regions. Many of the municipalities that existed prior to 2007 were considered too small to provide effective local services, in particular in the health sector. The reform sought to address these challenges by improving the municipalities' capacity to deliver high-quality services and do so more efficiently by creating economies of scale. Most of the newly established municipalities have a minimum size of 20 000 inhabitants. The reform also sought to clarify responsibilities for different levels and sectors of education, transferring the responsibility for general upper secondary education from the counties to the central-level administration, thus making it responsible for all upper secondary education. In addition, municipalities were given full responsibility for both mainstream and special needs compulsory education to facilitate a more effective use of resources (Houlberg et al., 2016, p. 100[86]).

Sources: Nusche, D., et al. (2011), *OECD Reviews of Evaluation and Assessment in Education: Norway 2011*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264117006-en; Nusche, D., et al. (2016), *OECD Reviews of School Resources: Denmark 2016*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264262430-en.

Regional co-ordination and planning platforms

Regional co-ordination in the organisation of school networks commonly serves two objectives: i) increasing efficiency in the school network by rationalising its provision across administrative boundaries and ii) making the planning of local networks responsive to the wider community's needs by integrating it into regional development strategies.

Regional level planning processes can provide a platform for local actors to communicate and can encourage horizontal co-operation between them. They can remove barriers for

co-ordination in governance arrangements that provide few incentives for collaboration or where the small size of municipalities limits their capacity to do so. Potential areas for such collaboration include the provision of school services (e.g. the co-management of schools across municipalities), improving transportation services, the common use of school facilities, joint purchasing, school maintenance or improving teachers' access to professional services.

Existing structures for regional planning or administration can be built on and expanded to assume a stronger role in the planning of the school network. For example, local or regional offices of the central government can act in a co-ordinating capacity to support the collaboration of local authorities in planning their educational provision. This involvement of central authorities in co-ordinating the local organisation of the school network, however, is not always welcome. In Estonia, for example, the OECD review team found that the county-level education departments struggled to effectively assume a co-ordinating role since many municipalities did not perceive them as legitimate partners in the governance of the school network (Santiago et al., 2016, p. 83[14]).

In the absence of existing structures or traditions of regional co-ordination and planning, some systems have considered establishing new regional planning platforms. These can cover all levels of school education, involve relevant stakeholders (e.g. municipalities, self-governing regions, regional industry representatives, as well as representatives of state or national authorities) and provide formal or informal ties to the authorities responsible for regional development processes. In the case of the Slovak Republic, the OECD review team recommended developing and launching such platforms on a pilot basis in one or two self-governing regions (Santiago et al., 2016, p. 101[13]).

Portugal, which does not have a formal regional tier of administration, recently made it possible for municipalities to organize themselves as inter-municipal communities (*Comunidades Intermunicipais*, CIMs) to develop strategic plans for regional development and strengthen their horizontal co-ordination. Since 2013, 23 such inter-municipal entities have been formed, two of which correspond to the metropolitan areas of the largest cities – Lisbon and Porto. CIMs play a role in the regional governance of education by providing a platform to share experiences across municipal boundaries and by developing integrated education plans at the regional level, based on their constituent municipalities' local education plans (*cartas educativas*). CIMs can also play an important role in helping central authorities to steer and regulating their VET offer as part of the recently created Qualification Needs Anticipation System (*Sistema de Antecipação de Necessidades de Qualificação*, SANQ). As part of this process, regions can co-ordinate contributions from local VET providers and employers to develop rankings of the regional qualification priorities, which in turn inform the central authorities' targets for the number of VET classes to be created in each CIM. Initially, few CIMs had the technical capacity or initiative to effectively take advantage of this widened scope for horizontal co-ordination and regional planning. Since the policy's introduction, however, a growing number of CIMs have adapted centrally defined priorities for the regional VET offer based on their own stakeholder consultations and assessment of needs (Liebowitz et al., 2018[88]).

Strengthening the regional dimension in the organisation of the school network is particularly important in systems that exhibit major regional demographic and economic disparities. Effective school network planning procedures need to be sensitive to these conditions while taking into account the role that school networks play for local and regional development objectives. As will be discussed further in Chapter 3, making the

governance of school networks responsive to local and regional contexts and connecting it to the wider institutional framework of regional development is an important challenge for school systems (Santiago et al., 2016, p. 95[13]).

In Estonia, for example, where the challenges confronting the school network vary considerably between different parts of the country, authorities have been looking for ways to strengthen the county or inter-municipal dimension in their strategic reflections. This "regionalisation" can be promoted through the development of institutional mechanisms for school network co-ordination and planning. An OECD Public Governance Review therefore recommended that national, county and municipal governments should consider creating regional "cluster districts" (also sometimes referred to as "collaboratives" or "federations") to encourage more effective and efficient educational management (OECD, 2011, p. 328[69]).

Local administrations' support for central network planning

Even in systems where the ultimate responsibility for the design and planning of the school network is vested at the central level, local and regional authorities can make a significant contribution to the process. The local administrators' knowledge of the school community they serve makes them valuable partners for the development and implementation of strategies to increase the efficiency of local school networks and assess the long-term infrastructure needs in light of the prospective demand and regional development objectives. Central authorities might thus consult local administrations on matters such as the identification of emerging needs for educational services within a region, the expected demand for school places (potential enrolment, preferences of students etc.), their supply (capacity constraints, quality etc.) and developments or trends affecting the region's social and economic needs (Santiago et al., 2016, p. 102[13]). They can also systematically report inefficiencies within their jurisdiction and instances of high unit costs or low quality provision. In some cases, this also involves leveraging local capacity for the systematic collection of data and its supply to national administrators. Furthermore, local administrators can be a key partner in the implementation of network reforms, acting as a broker managing stakeholder engagement processes or communicating proposals to the local community (see below).

Rationalising the distribution of responsibilities across levels of administration

While some countries have responded to challenges related to the size and capacity of local authorities by consolidating administrative structures or strengthening co-ordination mechanisms, others have considered reversing the process of devolution and recentralising responsibilities for those parts of the school network that local authorities may lack the capacity to govern effectively. This can take the form of moving responsibilities to higher levels of administration or creating new bodies to administer a larger number of schools. An example of large-scale recentralisation efforts in Estonia is described in Box 2.10.

Systems that are recentralising parts of their school network governance may do so across the board or selectively, and some countries have opted for a flexible implementation that recognises differences in the capacity and performance of local providers. This could involve the option for municipalities to seek certification and continue to operate their local school system within a strengthened accountability framework (OECD, 2017[2]). In the case of Estonia, for example, the review team suggested that its recentralisation strategy for upper secondary education should involve "both a dialogue with

municipalities (to determine which ones could maintain the operation of their gymnasiums under a state-defined regulatory framework) and co-ordination at the county or regional level to define where the operation of state-run gymnasiums is pertinent" (Santiago et al., 2016, p. 98[14]). Likewise, in Denmark, municipalities that lack the capacity to organise the provision of special needs education themselves can rely on services provided through the regions (Nusche et al., 2016, pp. 36, 55, 82[19]).

Box 2.10. Recentralisation of upper secondary education in Estonia

The Estonian school network, particularly in rural areas, is characterised by inefficiencies stemming from a large number of small municipalities providing upper secondary education to a decreasing number of students due to a rapid population decline and urbanisation. As a means to rationalise its school network, the Estonian government pursued an indirect recentralisation strategy that consisted of two components: First, basic and general upper secondary education were separated by preventing local governments from opening new full-cycle schools for Years 1-12 or schools which combine upper secondary education with other levels. (This restriction has since been lifted, but new school openings remain largely confined to private basic schools, not full-cycle schools). Second, the state sought to consolidate the general upper secondary network by constructing a new gymnasium in each state, hoping that the smallest municipalities would cease to offer this level of education and send their students to the state-run schools instead. Even though the state has no power to close upper secondary schools under local control, the reform provides municipalities with financial incentives to rationalise their upper secondary and basic education school networks, given that the newly constructed gymnasiums are fully funded by the state (Santiago et al., 2016, pp. 137, 75[14]). In addition, municipalities can apply for investment grants to improve their basic school provision under the condition that they take steps to improve the efficiency of their school network, e.g. by closing or merging their upper secondary schools.

The 2016 OECD review pointed to a number of concerns regarding the reform's implementation. One challenge could arise in counties whose constituent municipalities are able to continue providing upper secondary education at an efficient scale, which would then compete for students with the newly opened state-run gymnasiums, thus exacerbating the fragmentation of the school network. A second concern is that the recentralisation of upper secondary education might weaken its link to regional development strategies. The OECD review therefore suggested taking a selective approach to recentralisation and delegate the provision of upper secondary education in some larger municipalities conditional on their proven experience and capacity. A second recommendation was to ensure that regional development objectives remain a relevant dimension in defining the organisation of schools and supply of courses. Regular consultations of relevant stakeholders could help to retain the school offer's responsiveness to diverse regional and local expectations despite its recentralisation (Santiago et al., 2016, p. 94 f.[14]).

Source: Santiago et al. (2016), *OECD Reviews of School Resources: Estonia 2016*, OECD Publishing, Paris, http://doi.org/10.1787/9789264251731-en.

Recentralising education services and school network governance entails the risk of weakening the links between education and local development planning. Yet, centralisation does not necessarily preclude a simultaneous emphasis on regionalisation and attention to local needs. Some recentralisation initiatives have been accompanied by mechanisms to ensure that local development objectives are considered when defining

approaches to the school network, for example by ensuring the consultation of relevant local stakeholders (see below) (Santiago et al., 2016, p. 98[14]).

Stakeholder involvement in network planning and infrastructural developments

Involving relevant stakeholders in school renovations and infrastructural investment programmes is important to ensure that the process is aligned with their needs and practices and to manage the expectations of those affected by the changes. This includes helping teachers and students to navigate the inevitable disruptions in their daily routine during the construction works and to recognise the longer-term benefits of the renovated facilities (Blyth et al., 2012[6]). Engaging stakeholders upfront can also improve project outcomes and ensure that school buildings are better used and cared for upon the project's completion (Fisher, 2000[88]).

Stakeholders' views may be consulted at the point of commissioning, during the selection of project proposals or their final execution. In practice, the extent to which stakeholders are involved in renovation projects at all, the stage at which they are consulted, the formality of the process and the range of actors that are addressed varies considerably, often from one project to the next. Establishing a dialogue in which all actors feel that their voices are heard is challenging. The Flemish Community of Belgium, which has a long-standing tradition of and commitment to participatory governance, illustrates some of the challenges and opportunities of stakeholder involvement. In a case study on the development of attainment targets, Rouw et al. (2016[10]) found that opening governance structures and processes to wide participation could generate a virtuous cycle that enhances knowledge mobilisation and allows for the tailoring of policy design and implementation in response to stakeholder needs. Not just encouraging, but expecting stakeholders to express their views and expertise was seen as an effective way to strengthen a common understanding and ownership of policies. Nevertheless, involving stakeholders beyond the education sector and ensuring that professional expertise is valued amidst the growing number and diversity of stakeholders remains difficult (Rouw et al., 2016[10]).

In the case of Portugal's Secondary School Building Modernisation Programme (SMP), which was launched in 2007 and involved the renovation and expansion of 173 secondary schools, the independent state-owned company *Parque Escolar* (PE) was responsible for overseeing all stages from the planning and funding to the maintenance of completed buildings, including a relatively standardised but intensive process of community involvement (Veloso, Marques and Duarte, 2014[90]). At the local level, this engagement took the form of information sessions and consultation meetings before and during the construction process, which brought together parents, teachers, students, school boards and non-teaching staff with engineers and architects. An OECD review of the SMP programme confirmed that these meetings gave local stakeholders the sense that they had an impact by responding to and providing input into the planning process, although the exchange of information with national-level stakeholders (e.g. national teachers unions and parents' organisations) was rather limited (Blyth et al., 2012[6]). Moreover, the SMP played an important role in supporting the simultaneous consolidation of Portugal's school network (see Chapter 3, Box 3.6). When planning capital investments, the programme could take into account that some school buildings would need to be expanded or adapted to accommodate students of recently closed schools, which helped to mitigate the negative effects of school closures (Liebowitz et al., 2018[88]).

Even more so than school renovations, the closure of facilities can have a strong impact on local communities. Consolidation plans have frequently been met with strong and organised opposition from students, parents, teachers and staff (Ares Abalde, 2014, p. 28 f.[22]). Consultation and stakeholder engagement are therefore widely recognised as particularly important to solicit input, identify and respond to concerns among the local community and build consensus around proposed restructuring plans (for more details, see Chapter 3).

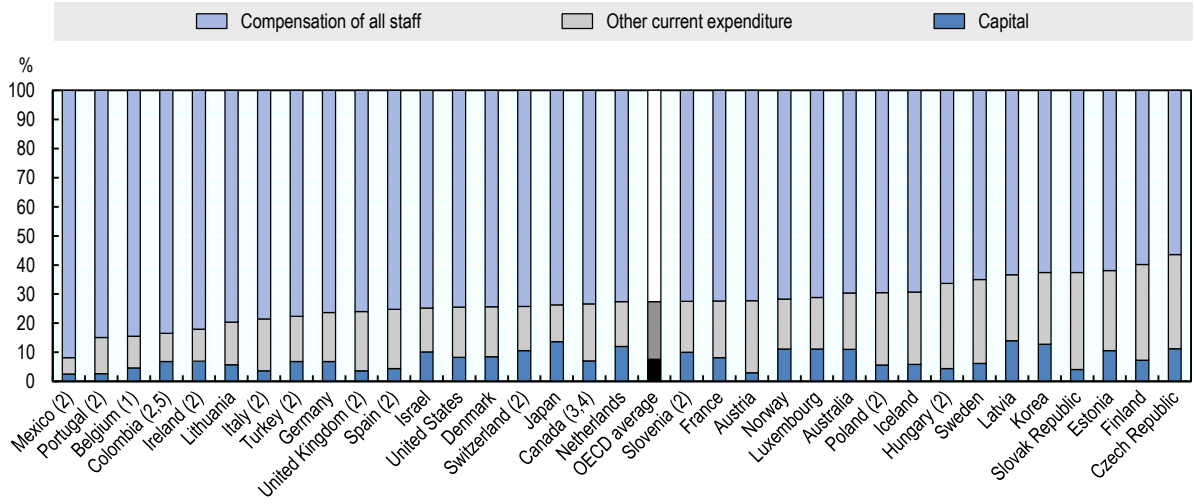
2.4. Financing the development of the school network

For the steering and planning mechanisms described above to have the desired effect and enhance the efficiency of the school network, they need to be supported by concomitant funding mechanisms to ensure that the network and its facilities can be adequately developed and maintained. As discussed in Chapter 1, access to adequate educational facilities and materials is a critical condition for students to enjoy a high-quality education and for teachers to employ their skills effectively. Ensuring that infrastructural funding is channelled to where it matters the most and that instruction is supported by an equitable distribution of educational materials is therefore an important concern for policy makers across the OECD.

The importance of this objective has 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[91]). 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 "build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all" (United Nations, 2015[92]).

Even though the labour-intensive nature of education means that the largest proportion of overall expenditure in schools is devoted to the teaching work force, a considerable share of education budgets in OECD countries is spent on the construction of school buildings, their adaption and maintenance as well as teaching materials. Particularly in a context of increasing fiscal pressure, the way in which educational infrastructure is funded therefore plays an important role for a school system's ability to achieve its goals efficiently. The considerable variance in OECD countries' infrastructural expenditure (see Figure 2.5) also points to the different efficiency challenges that their school networks face, but also to their varying success in addressing them. The mechanisms by which infrastructural resources are distributed therefore play an important role in ensuring that funding reaches the facilities most in need of investment and in aligning the distribution of resources with policy priorities for the efficient organisation of the school network.

Figure 2.5. Average proportions of capital expenditure, staff compensation and other current expenditure from public and private sources in primary education, 2011-2014



Note: Countries ordered in descending order of their total non-staff expenditure.
1: Public and government-dependent private institutions only (for one or more of the years).
2: Public institutions only (for one or more of the years)
3: Includes pre-primary and lower-secondary programmes
4: Period of reference 2010-2014
5: Period of reference 2011-2015
Source: OECD (2017), *Education at a Glance 2017: OECD Indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2017-en, Tables B6.1 and B6.2; OECD (2016), *Education at a Glance 2016: OECD Indicators,* OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2016-en, Tables B6.1 and B6.2; OECD (2015), *Education at a Glance 2015: OECD Indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2015-en, Table B6.1; OECD (2014), *Education at a Glance 2014: OECD Indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2014-en, Table B6.1; Latvia prior to 2013 and Lithuania: Eurostat; Colombia: UNESCO Institute for Statistics.

StatLink https://doi.org/10.1787/888933831203

Expenditure on educational infrastructure and materials varies significantly across countries

The OECD defines capital expenditure by educational institutions as spending on assets that last longer than one year. This includes, for instance, the construction, renovation and major repair of school buildings. Current expenditure, by contrast, refers to spending on resources that are required each year for the operation of schools (OECD, 2017[93]). Figure 2.5 shows the proportions of total expenditure in primary education spent on capital resources, the compensation of staff and other current expenditure. The latter includes expenditure on teaching materials, energy and communal services, as well as the maintenance of school buildings or rental of facilities.

The proportion of total expenditure devoted to capital spending varied widely around the OECD average of 8% between 2011 and 2014, ranging from less than 4% in Austria, Italy, Mexico, Portugal and the United Kingdom to 12% or more in Japan, Korea, Latvia and the Netherlands. Although the data does not allow a precise estimation of all expenditure on educational infrastructure since some of it is classified as capital and some as current expenditure, there appears to be a wide range of spending in this area. Non-staff related current expenditure combined with capital expenditure accounts for 20% or

less of the education budget in Belgium, Colombia, Ireland, Lithuania, Mexico and Portugal but more than 35% in the Czech Republic, Estonia, Finland, Korea, Latvia and the Slovak Republic, around an OECD average of 27% between 2011 and 2014 (Figure 2.5).

While a range of factors may contribute to these differences, inefficient spending is arguably one of them. Particularly where schools enjoy a high degree of financial autonomy, different levels of capacity and experience mean that some schools require additional guidance and support to procure goods and services efficiently. Countries such as England (United Kingdom) have therefore sought to improve their spending on non-staff goods and services with initiatives described in Box 2.11 (Department for Education, 2017[94]).

Box 2.11. Initiatives to increase the efficiency of non-staff spending in English schools

England (United Kingdom) has launched multiple initiatives to increase the efficiency of school's non-staff spending in a period when many of them are facing budgetary pressures. The **Schools' Buying Strategy**, published by the Department for Education, aims to help schools save a significant proportion of their non-staff-expenditure and points them to various tools and advice for school leaders and financial administrators (typically "School Business Managers"). As part of a wider effort to advance the professionalisation of schools' financial staff, the ministry brings together best-practice guidance and practical support such as templates for each step of an effective procurement procedure. The tools provided by the ministry also include an online benchmarking system that allows schools to compare their overall spending patterns and specific expenditure lines with those of similar schools to identify inefficiencies and cost-saving potentials.

A central element of England's effort to reduce schools' non-staff spending are the so-called "**National Deals**" – framework agreements that are centrally procured and publicised by the Department for Education in conjunction with partnering organisations. Since many schools have difficulties procuring a wide range of goods and services in a complex market environment, the ministry offers them the opportunity to take advantage of nationally agreed rates and benefit from economies of scale. These national deals give schools an opportunity to save on their existing contracts for, among others, water and electricity; software licenses; and ICT supplies. According to the ministry, as of 2017, over 3 300 schools had taken advantage of the national deals for multi-functional devices, saving up to 40% on printers and photocopiers. The National Deals programme also offers interest-free loans to fund energy-saving improvements and the popular Risk Protection Arrangement, which provides schools with a cheaper alternative to commercial insurance providers.

Sources: Department for Education (2017), *Schools' Buying Strategy*, London.

Interdependencies and trade-offs between current and capital expenditure

To ensure that the school network's development is adequately and sustainably financed, responsible authorities need to apply strategic foresight and consider the interdependence between different types of expenditure. This includes prioritising between long-term and short-term investments, between capital investments and maintenance funding, and

between core and ancillary educational goods and services. Capital investments, for example, can have a significant long-term impact on the funding required for the new infrastructures' maintenance, just as putting off regular repair works can result in the need for major overhauls and capital investments further down the line. Budgeting maintenance expenditures for capital investments is not trivial and may require rigorous analyses by qualified professionals. While an annual maintenance expenditure amounting to 1% of a new building's construction cost was once considered a reasonable budgeting basis, techniques have since become significantly more refined (Beynon, 1997, p. 52[8]).

Local authorities or school leaders that lack the capacity to account for these interactions between capital investments and current maintenance funding are likely to engage in inefficient spending. This challenge is often compounded where the responsibilities for allocating capital and current expenditure are divided between different authorities or where the two funding streams are provided through independent mechanisms following different timelines or with different degrees of predictability. Under these conditions, additional co-ordination efforts between the responsible authorities and schools may be necessary to avoid inefficient or unsustainable spending patterns.

Whenever school providers find themselves confronted with trade-offs between capital and current expenditure, there is a risk that their incentives are systematically aligned in ways that crowd out the benefits of long-term investments. This is often the case where schools operate on tight budgets without earmarked funding for maintenance or capital spending and leaders struggle to mobilise sufficient resources for the maintenance and improvement of their school buildings. In Colombia, for example, current expenditure tends to consume such a large share of schools' budgets that no funding remains for important repair works and the improvement of facilities (Radinger et al., 2018[50]).

Capital funding

The mechanisms that OECD review countries use to allocate capital funding to schools or local authorities vary across school sectors, levels of education and types of expenditure. In the majority of the 17 education systems participating in the review's qualitative survey, capital funding reaches schools through more than one mechanism and is sometimes provided to them by multiple authorities (see **Error! Reference source not found.**). While funding for current expenditure is usually allocated using earmarked grants or restricted block grants, the distribution of capital funding tends to rely on ad hoc grants and resources channelled through investment programmes. In 12 of the 17 review countries, part of the resources for capital expenditure are allocated to schools using ad hoc grants and 11 systems distribute resources for construction projects, maintenance or renovation through infrastructure investment programmes (see Box 2.12). Somewhat less frequently, school systems use discretionary funding (8), a negotiated process (4), annual grants (4) or earmarked grants (4).

In some cases, these allocation mechanisms are used alongside targeted funding in support of specific policy initiatives or contributions from international agencies such as the European Commission's Structural Funds (OECD, 2017, pp. 253, Annex A[2]). Many systems use different allocation mechanisms to distribute funding for the construction of new schools, the expansion of established schools, or the renovation of existing facilities. Of the five OECD review countries that used vertical transfers to distribute capital funding between levels of administration, three did so through infrastructure investment programmes, and two used earmarked grants and discretionary funding respectively.

Box 2.12. Examples of targeted infrastructure investment programmes

Australia's Building the Education Revolution (BER) programme

Following the 2007 global financial crisis, the Australian government launched a federal investment programme, Building the Education Revolution (BER), which provided AUD 16.2 billion in earmarked grants to fund infrastructure projects and the construction of primary and some secondary schools. The programme was intended to provide an economic stimulus to local communities and generated 23 675 construction projects delivered by 22 government and non-government education authorities (Commonwealth of Australia, 2011[95]).

Austria's school development programme (Schulentwicklungsplan)

The Austrian federal government adopted a long-term school development programme (*Schulentwicklungsplan,* SCHEP-NEU) aiming to invest EUR 1.66 billion to fund the extension, refurbishment or reconstruction of one third of all federal schools between 2008 and 2018. The programme focuses on the modernisation of existing infrastructure to provide students and teachers with adequate classrooms and workplaces although investments are also made to allow for the expansion of all-day schools and school-based day care (Bruneforth et al., 2016[4]). The investments are transferred to the owners of school buildings, mostly the Federal Real Estate Company and municipalities, via increased rental payments. The spending allocated through the programme is based on careful planning with medium-term and long-term prognoses for infrastructure needs developed with bottom-up input.

Sources: Commonwealth of Australia (2011), *Building the Education Revolution Implementation Taskforce: Final Report*, Commonwealth of Australia, Canberra; Bruneforth M. et al. (2016), *OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools: Country Background Report for Austria*, Bundesministerium für Bildung und Frauen, Vienna.

While funding for current expenditure is usually allocated on a recurrent annual basis, capital expenditure grants in the majority of OECD review countries are allocated less regularly. Notable exceptions to this are schools in the Czech Republic, Denmark and upper secondary vocational schools in Chile, which receive at least part of their capital funding in the form of annual grants (OECD, 2017, p. 140[2]).

The responsibility for allocating capital funding to schools or school providers may lie with either central, regional or local authorities, dedicated agencies or a combination of these actors. Compared to current expenditure, the responsibility for managing capital expenditure funding tends to be less decentralised. In Spain, for example, public schools directly administer the funding dedicated to cover their operating costs, while the cost of major repair and maintenance works are charged directly to the corresponding education authority and schools are not authorised to sign major contracts for construction works and infrastructural developments (INEE, 2016, p. 96[96]).

This is reflected in countries' responses to the review's qualitative survey: In 12 of the 17 OECD review countries, the central level is responsible for allocating at least part of the capital funding for education. In 13 of 17 countries, local authorities also bear some responsibility for the allocation of capital funds, sometimes complementing central funding through supplementary earmarked grants or only allocating capital funding for

schools of a specific provider or at a particular level of education. Regional authorities and dedicated agencies feature less frequently and bear responsibility in only six and three of the OECD review countries respectively. In all but one country, responsibilities for the funding of capital investments were shared between at least two and often three actors, most commonly involving both central and local authorities (OECD, 2017, pp. 253, Annex A[2]).

Capital funding is often driven by the availability of resources, rather than strategic long-term planning and the holistic assessments of infrastructural needs

The use of multiple allocation mechanisms for capital funding across sectors and a fragmentation of responsibilities across multiple levels of government can make it difficult to co-ordinate infrastructural development projects and foster a coherent regional organisation of the school network. In Australia, for example, a 2011 review of capital funding mechanisms noted that school capital and infrastructure investments often lacked a co-ordinated approach to cross-sectoral planning, which complicated the balanced and efficient development of the school network in new suburbs and towns. As a remedy, the review recommended reducing the complexity of capital funding mechanisms by establishing two main funding streams to support new constructions and investment in existing infrastructure. Although the plans were ultimately not implemented, the review also proposed establishing School Planning Authorities in all states and territories to co-ordinate the development of the school network and strengthen cross-sectoral planning at the regional level (Gonski et al., 2011[97]).

In contrast to current expenditure, the level of capital expenditure grants is rarely determined using a funding formula. One reason for this is the nature of capital resources, whose value fluctuates over time as they deteriorate and age or benefit from maintenance works and renovation. As a consequence, there are significant differences in the state and value of fixed assets and the associated need for capital funding across sectors and individual schools, which must to be taken into account when allocating funding for capital expenditure (European Commission/Eurydice, 2000[98]). Data that would account for this complexity is limited and capital funding needs often emerge unexpectedly. This renders the estimation of annual capital requirements difficult at the school level and for the most part prevents the use of formula funding. There have also been concerns that distributing capital funding through a formula might create perverse incentives that could undermine the efficiency of the school network by encouraging the establishment of new schools in areas with sufficient capacity or by discouraging the merger of school facilities even where there is a strong case for consolidation (Gonski et al., 2011[97]).

Instead, OECD countries commonly determine the level of capital funding based on an assessment of needs or administrative discretion – both of which are used in 11 of the 17 OECD review countries (OECD, 2017, p. 140[2]). These allocation methods commonly involve efforts to target funding to schools with the greatest need for renovations, remodelling works or emergency repairs. In countries with decentralised governance structure, the standards used to assess a school's need for capital expenditure grants may vary even from one municipality to the next, as is the case in Sweden. As with the mechanisms used to allocate funds, eight of the review countries reported using at least two different methods to determine the amount of capital funding for different kinds of providers, for different levels of education or for different purposes. Furthermore, three of the 17 systems reported allocating capital funding on a competitive basis and many local authorities ask schools to provide an application dossier based on which their requests for financial support are assessed.

Given the supply-driven nature of many countries' capital funding mechanisms, the development of school infrastructure risks to be led primarily by the current level of available resources, rather than by strategic long-term planning and holistic assessments of infrastructural needs. This can generate inefficiencies due to the misallocation of excess funding on the one hand, and the under-investment in pressing construction needs due to temporary shortages on the other hand. Notable exceptions include capital development projects that are based on the programmatic reorganisation of the school network, such as the construction of state-run gymnasiums in Estonia or the investment in multi-function centres in Lithuania, which were supported by EU structural funds with the strategic goal to consolidate the network of rural pre-primary and primary schools. Some countries have sought to lay the basis for a more permanent needs-driven approach to capital funding. Regular surveys assessing the condition of school buildings over time can support authorities in identifying the magnitude of overall and school-level needs and in evaluating the effectiveness of its interventions. Improved data on site conditions can inform the allocation of funding on a case-by-case basis or as a variable in funding formula, and strengthen the education ministry's evidence base in inter-ministerial budget negotiations.

International funding plays an important role for capital investments in multiple OECD review countries

Several OECD review countries have significantly benefited from international funding to support investments in educational infrastructure (see (OECD, 2017[2]), Box 2.2 for an extensive discussion). The European Union (EU)'s two structural funds – the European Regional Development Fund (ERDF) and the European Social Fund (ESF) – are designed to promote economic and social development and address specific needs of disadvantaged regions across the European Union. EU funds are allocated subject to the European Commission's approval of the recipient states' operational programme, in which they outline the funding's strategic objectives and propose an auditing framework. The managing authorities at the national level are then responsible for administering the funds and allocating them to projects and sub-central beneficiaries. Member states are also required to co-finance their operational programmes to varying extent.

All Czech regions, for example, qualify to benefit from European funding, which has proven to be instrumental in developing the school network. EU Structural Funds have primarily been used to support the consolidation of upper secondary provision (in line with regional action plans supported by European Structural and Investment Funds) and to increase capacity for pre-school and basic education in certain regions with strong demographic growth in these age groups (Shewbridge et al., 2016, p. 76[15]). Likewise, Estonia has benefited from EU funding through its Operational Programme for Cohesion Policy Funds 2014-2020 the funding has assisted Estonia's school consolidation process by developing a network of state-run upper secondary general schools and supporting municipalities in strengthening their basic education schools (Santiago et al., 2016, p. 99[14]).

In Latin America, international agencies such as the Inter-American Development Bank (IDB) and the World Bank have played a major role in financing educational projects, often focussing on capital expenditure and the improvement of infrastructure to support the expansion of educational services. In Uruguay, for example, loans from the World Bank were used to finance the Support Programme for Public Primary Education (*Programa de Apoyo a la Enseñanza Primaria Pública*, PAEPU), which invests in the infrastructure and equipment of full-time schools. Uruguay also co-operates with the IDB,

whose loans have funded the country's Support Programme for Secondary Education and Training in Education (*Programa de Apoyo a la Educación Media y Formación en Educación*, PAEMFE), which strategically invests in the infrastructure and equipment of secondary education and teacher training institutions (INEEd, 2015[99]; Santiago et al., 2016[84]).

A lack of capacity can impede the equitable distribution and use of capital funding

Given that many countries require schools and local authorities to apply for capital funding, a lack of capacity or experience in writing grant applications can compromise their access to investment. Particularly small and disadvantaged schools may lack the resources, time or trained personnel to launch successful bids for capital funding. Discrepancies in local capacity can thereby undermine the efficient distribution of capital funding to the areas and schools that exhibit the greatest need and exacerbate inequities in the school network.

An evaluation of Australia's Building the Education Revolution investment programme and its implementation echoed some of these concerns, pointing to a number of challenges that are frequently encountered in the course of large infrastructural investment projects. In particular, the report suggested that some states lacked the technical capacity to deliver the programme successfully and ensure that external organisations tasked with the management of the programme delivered on their contract obligations (Commonwealth of Australia, 2011[95]). This underlines the importance of building adequate capacity and skills among sub-central administrations and schools, allowing them to provide effective oversight and management for outsourced projects.

Capital investments for public and private providers

In many education systems, public and private providers are subject to different rules governing the funding of capital expenditures. Of the 17 education systems participating in the review's qualitative survey, seven reported that privately managed schools are not eligible for any public capital funding, while systems like the Czech Republic leave the capital funding of private schools to the discretion of local authorities. In another seven education systems, government-dependent private schools are eligible for some, but excluded from other sources of capital funding (see Annex Table 2.A.1). This is the case in the French Community of Belgium, where private schools are not eligible for ad hoc grants provided at the discretion of the state authority, even though their current expenditure is funded in the same way as that of public schools. Countries like Sweden, where government-dependent private schools are treated similarly to public schools when it comes to capital funding are the exception. In the Flemish Community of Belgium, public schools belonging to the Flemish Community Education Network (GO!) are entitled to grants covering 100% of their expenditure on school buildings. Grant-aided public schools and private providers, on the other hand, have to co-finance part of their capital investments with the option of using state-guaranteed loans or applying for an ad hoc grant covering up to 70 % of the expenses (see Box 2.13).

Restrictions on the public funding of private schools' capital investments is partly explained by concerns that their infrastructure might not permanently serve the public good and could eventually be sold off or repurposed by the private operators. Some school systems, including the Flemish Community of Belgium, seek to prevent this practice by requiring private providers to use their publicly subsidised facilities for educational activities over a period of at least thirty years. Nevertheless, once this time

has expired, they can sell the building without returning the equity to the government or reinvesting it in educational services. Even though a high level of educational demand in Belgium makes it unlikely that private providers will sell school buildings at a large scale and cause unanticipated drops in the provision of school places, it limits the public authorities' leverage to ensure that the facilities they invest in serve societal needs and the public good in the long term. As the OECD review noted, retaining ownership of these facilities could also increase the public authorities' scope to steer the use of facilities, for example by facilitating the sharing of buildings with community groups or between schools (Nusche et al., 2015, p. 125 f.[9]).

Spain provides an interesting example of an allocation system in which private institutions' access to capital funding depends on the general planning of the educational offer. Access to public capital funding is conditional on factors such as to the need for free pre-primary places in the school area, the number of additional school units needed and the presence of students with socio-economic disadvantages.

Box 2.13. Capital funding for private providers in the Flemish and French Communities of Belgium

Capital expenditure in the Flemish Community (ISCED 0-3)

In the Flemish Community, access to capital funding is organised by two public agencies. A dedicated public body, GO! Education of the Flemish Community, finances the construction and improvement of buildings in the Flemish Community school network as public assets. The Agency for Educational Infrastructure (*Agentschap voor Infrastructuur in het Onderwijs*, AGIOn) finances building works in schools of other public school providers (municipal and provincial) as well as publicly subsidised private schools. AGIOn meets 70% of their capital funding needs in primary education and 60% in secondary education. The unsubsidised balance can be covered by a state- guaranteed loan. The buildings of publicly subsidised private schools remain in private ownership. For public school organising bodies, buildings are owned by the regional and local authorities (municipalities and provinces). Public-private partnerships are another source of capital funding (see Box 3.11).

Capital expenditure in the French Community (ISCED 0-3)

In the French Community, public schools receive capital funding through a school building fund. Publicly subsidised private schools do not benefit from this fund, but they are granted a capital repayment guarantee for construction, renovation, modernisation and expansion projects (Decree 05/02/1990). A priority programme of works (*Programme prioritaire de travaux*, PPT) makes it possible to remedy essential needs by allocating funds for emergency works to all school providers. The French Community covers 70% of capital funding needs at the primary level and 60% at the secondary level, while the school providers cover the remaining balance (Decree 16/11/2007).

Source: OECD (2017), *The Funding of School Education: Connecting Resources and Learning*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264276147-en.

Maintenance funding

Besides the initial capital investment required for their construction or expansion, school buildings generate ongoing maintenance cost. Keeping educational facilities in an adequate condition and extending their lifetime requires ongoing preventative and compliance servicing, expenditures on utilities, and capital replacements including the repair and remodelling on the building, its furniture and equipment (Beynon, 1997, p. 51[8]). Based on the review's qualitative survey, countries used a variety of different mechanisms to allocate funding for infrastructure maintenance. Most frequently they used ad hoc grants and discretionary spending by local authorities, but in some cases also infrastructure investment programmes and earmarked grants (OECD, 2017, pp. 253, Annex A[2]). Although many school systems use separate mechanisms to allocate capital and maintenance funding, distinguishing between the two is not always straightforward and can be a source of ambiguities both at the national level and in comparative work.

According to the OECD definition, funding intended for maintenance and small repair works is considered part of schools' current expenditure since – unlike capital spending – its main value added is not expected to exceed beyond the allocation year. However, not all OECD review countries adhere to this clear-cut distinction and in many systems, some types of maintenance activities are counted as part of current expenditure while others fall under the allocation mechanisms for capital funding (OECD, 2017, pp. 253, Annex A[2]). In the Flemish and French Communities of Belgium, for example, part of the schools' maintenance funding is distributed to school providers as part of a block grant based on a formula similar to that for other forms of current expenditure, while the maintenance of school buildings in Israel is – unlike their construction and current expenditure – the direct responsibility of municipalities. Providing clear national guidance on which maintenance and repair works should be covered by funding for current expenditures can help to shed light on this grey area and reduce ambiguities (Gonski et al., 2011[97]).

Particularly where the responsibilities for capital and maintenance funding are split between different authorities, a good level of co-ordination is needed to ensure that the future maintenance cost of facilities and equipment is fully funded and accounted for when engaging in major capital investments. Ad hoc programmes that finance school construction using central budget funds, for example, can burden local authorities with unsustainable recurring costs for years to come. Ensuring that the responsible authorities have the means to maintain newly built schools, procured equipment and older facilities, should be an integral part of the annual budgeting process (OECD/The World Bank, 2015[100]).

The means by which maintenance funding is distributed can also provide incentives to raise efficiency by keeping school buildings in good condition and prevent more costly interventions in the future. Where capital funding is targeted to schools most urgently in need for repairs, school leaders may have few incentives to maintain their buildings efficiently, particularly if they have to meet the cost of routine maintenance from their own budgets. As noted in a report by the UK National Audit Office, one way to address this problem is to strengthen the accountability system for school maintenance and provide schools with sufficient funding to cover routine maintenance out of their budgets (British Department for Education, 2017[101]). Establishing guidelines or best practices for the maintenance of buildings and grounds alongside the regular collection of data on the conditions of facilities can provide a basis for holding local authorities or school providers to account.

Funding for educational materials

Besides an adequately maintained physical infrastructure, teachers rely on materials such as ICT, textbooks and lab equipment to provide their students with high-quality instruction. What matters most for student achievement is not so much the aggregate spending devoted to educational materials, but their equitable distribution, their quality and how effectively they are used in the classroom. Providing science classes with access to well-maintained laboratory material, for example, is not enough if teachers are not supported in designing and conducting well-structured laboratory activities that allow students to establish the links between the hands-on activities, key scientific concepts and real-life problems (OECD, 2016, pp. 187, 229[51]).

Nevertheless, a lack of adequate instructional materials can make it difficult for students and teachers to work effectively. According to data from the 2013 TALIS survey, between 26% and 38% of teachers across participating countries work in schools whose principals report a shortage of or inadequate instructional materials, computers or software, internet access and library materials. In some countries, these shortages are particularly pronounced. In Romania and the Slovak Republic, around 80% of teachers work in schools that lack adequate instructional materials like textbooks and more than half of the teachers in Mexico and Romania work in schools where library materials are a hindrance to quality instruction, according to their principals (OECD, 2014, pp. 47, Table 2.19[102]).

Schools in some OECD review countries have reported difficulties in providing their students with a sufficient amount of high-quality learning materials, including up-to-date textbooks. Where central authorities are responsible for distributing learning materials, these shortages may stem from an insufficient coverage or frequency of central supplies. Even though students in Kazakhstan, for example, are provided with free textbooks from the ministry, some rural regions fell short of universal coverage and the supply of textbooks did not always keep up with the rising student population in urban schools. In individual schools, reported delivery cycles of up to five years with no annual replacements for unintentional losses or damage posed similar problems, even though official regulations suggest that 20% of textbooks are to be replaced every two years to make up for wear and tear (OECD/The World Bank, 2015[100]).

An insufficient supply of high-quality textbooks and other learning supplies can also be a symptom of budget constraints and under-investment in schools. In the Slovak Republic, for example, many schools reported to lack the resources to supply their students with supplementary learning materials, while the textbooks supplied by the ministry were often insufficient or outdated. Besides ensuring that schools have sufficient funds for textbooks, allowing them to choose their own textbooks from a list of accredited publishers or titles can set incentives for external providers to fill this gap and bolster the market for learning materials. This approach is likely to work best in systems like the Slovak Republic, whose external assessments already provide a high degree of outcome-control over learning objectives and competencies. In subject areas where the market for potential textbooks is too small to be financially viable and for which the ministry lacks funds to commission experts, encouraging teachers to share self-created materials or providing them with downloadable online materials can alleviate pressing shortages (Santiago et al., 2016, p. 152[13]).

While most schools pay for instructional materials out of their general funding for current expenditure, some countries like Estonia use earmarked grants specifically dedicated to the purchase of textbooks (Santiago et al., 2016, p. 125[14]). Earmarked funding makes it

easy for the national government to ensure that funding is spent in accordance with its specified purposes. Strong public awareness of legal entitlements to textbooks, however, can often perform a similar function and exert indirect horizontal control over the adequacy of schools' expenditure on learning materials.

Textbooks are often free for students at the point of provision and can be borrowed for the duration of the school year. This practice contributes to an equitable access to learning opportunities and avoids the stigmatisation of disadvantaged students. In some countries, the free provision of textbooks is restricted to core subjects, to materials specified in a central curriculum or to specific student groups, as is the case in the Czech Republic, where free books in post-compulsory education are reserved for disadvantaged students (Shewbridge et al., 2016[15]). Although central authorities may play a role in commissioning and approving textbooks or regulating their preparation, review and publication, in most review countries, school leaders and teachers exercise considerable discretion over their choice of learning materials. According to principals' reports in the 2015 PISA survey, 82% of students across the OECD attend schools whose teachers have considerable responsibility for the selection of textbooks and 32% attend schools where the principal plays a significant role in their selection (OECD, 2016[51]).

Learning materials and infrastructures can be strategically deployed to support educational goals. Some countries have therefore introduced national standards and scaled up the adoption of specific provisions as a means to improve learning in line with pedagogical and curricular reforms. In Chile, for example, schools are required to have a library and the ministry has supported upper secondary schools since 1995 and primary schools since 2004 in setting up Learning Resource Centres (*Centros de Recursos para el Aprendizaje*, CRA) to this end. CRAs were part of a wider strategy to reform teaching practices and promote the use of printed and audiovisual materials to support the learning process. Schools participating in the CRA programme dedicate the space, furniture and staff for a school library and, in return, receive a collection of media resources and subscriptions as well as extensive training for library staff. By 2014, 10 781 CRA libraries had been created, 8 456 in basic education and 2 325 in upper secondary education, both in municipal and subsidised private schools (Santiago et al., 2017[46]).

2.5. Policy options

Build planning capacity at relevant levels of government and support school network planning by collecting and maintaining high-quality data

Developing planning capacity at the relevant levels of government is a cornerstone of advancing the efficient organisation of the school network. For authorities to leverage their capacity and engage in strategic planning, they also need to be supported by high-quality data on the capacity of school facilities and reliable forecasts of future demand. Administrative tools that integrate monitoring and forecasting mechanisms can help countries in recognising and responding to capacity shortages early on. Ideally, data collections and inventories should cover facilities across all relevant providers and sectors of education and be subject to regular updates. By combining enrolment forecasts with data on the current supply of educational services, authorities should leverage the potential of this data to identify discrepancies between the supply and demand for school places and develop appropriate responses, for example by developing capacity indicators to inform guidelines, recommendations or direct interventions into the organisation of the school network.

Data on school capacity and educational demand should also be used to inform stakeholders and public discussions on proposed initiatives and can help policy makers in assessing the likely consequences and feasibility of competing strategies to enhance the efficiency of the school network. As such, it allows policy makers to identify potential synergies arising from the sharing of facilities or the creation of school clusters and to simulate the expected effects of reforms on enrolment patterns across multiple sites.

Strengthen horizontal co-ordination mechanisms and invest planning authority at the appropriate level to enhance the management of the school network

Decentralisation processes have led to the emergence of increasingly autonomous and powerful local actors in many OECD education systems. In multi-level and multi-actor governance contexts, inefficiencies in the planning and organisation of school networks are often rooted in weak co-ordination mechanisms across disconnected subsystems and communities. It is therefore important for decentralisation to be accompanied by efforts to build capacity at the local level and develop effective mechanisms for horizontal and vertical co-ordination.

Consider promoting platforms for regional network planning

Effective mechanisms to support network planning activities need to reflect a school system's governance structure, the roles it assigns to local, regional and system-level entities, as well as their respective capacity to carry out these responsibilities effectively. Particularly in systems where small, local authorities with little capacity are responsible for the governance of the school network, establishing platforms that allow them to better co-ordinate their provision across administrative boundaries can enhance the network's efficiency.

Regionalised planning should include the analysis of potential mismatches in an area's prospective demand and supply for different education services. It should also encompass the identification of inefficiencies in the region's current education provision, including high unit costs or duplications in their programme offer. On the basis of this analysis, regional level platforms can facilitate bilateral or multilateral agreements between schools or local authorities to engage in school mergers, create clusters, share resources or jointly provide certain educational services, either by facilitating negotiations or by providing direct incentives for collaboration. Given the reciprocal nature of a region's educational provision and its general development, planning platforms should also take into account the region's economic and social development and the associated needs and opportunities for the infrastructural development of the school network.

Planning platforms can also facilitate the transmission of information across levels of government by providing a strong voice for regional interests and concerns at the national level while at the same time communicating system-wide developments and concerns to local actors. Particularly in countries with pronounced regional disparities, ensuring a strong regional dimension in the development of the school network can ensure that local specificities are taken into account in the formulation of national policies and goals and, conversely, that local developments are consistent with national priorities.

To advance the regional planning of the school network, authorities should seek to build on existing regional structures and co-ordination mechanisms where possible or institutionalise previously informal modes of co-operation. This can involve expanding the responsibilities and capacity of existing regional actors such as the education departments of regional government offices. In the absence of prior regional structures,

governments should consider establishing new platforms to strengthen regional level co-ordination and planning. Ideally, these should span multiple levels of education and involve relevant stakeholders from all levels of government. The implementation of regional planning platforms can be piloted in a number of selected areas, and should be accompanied by their continuous monitoring and evaluation.

Depending on the degree of formal authority vested with regional level actors, they could play a merely consultative role for local or central actors or assume substantial co-ordination and decision-making responsibilities. In the latter case, the regional platforms' potential to bring about greater efficiency can only be realised if they are adequately supported and equipped with sufficient capacity to assume their new responsibilities.

Establish a clear division of responsibilities for different parts of the school network

Maintaining a clear division of responsibilities for different parts of the school network can facilitate its efficient planning and oversight, reduce undesired competition between different public providers and increase the potential for co-operation among schools operating at the same education level. Ambiguities surrounding the responsibilities of public authorities can also make it difficult to assign political leadership for the governance of network reforms. A clear division of labour, by contrast, can strengthen the basis for school network planning by creating closer linkages and facilitating the alignment of strategic objectives, school-level management and accountability.

The same holds for the distribution of resources for infrastructural adjustments in the school network. Countries should ensure that the coherent planning of the school network is not undermined by fragmented responsibilities or mechanisms for the allocation of capital funding. Streamlining the distribution of capital funding and engaging representatives from different sectors in the assessment of needs can improve cross-sectoral and regional coherence in the development of the school network.

In the absence of sufficient local capacity, consider flexible approaches to recentralising the governance of the school network

In some circumstances, where local authorities are too small or lack the capacity to engage in effective network planning, it can make sense to re-recentralise responsibilities for parts of the educational offer. In this case, governments should take appropriate steps to ensure that the recentralisation process does not compromise the network's responsiveness to local and regional needs. This could be achieved through a flexible approach to centralisation that is sensitive to differences in the capacity and performance of local providers and gives them the option to retain their autonomy, provided that they can demonstrate their ability to do so effectively within a strengthened accountability framework. Regardless of whether the school network's development is planned and co-ordinated at the central, regional or local level, it should be recognised that its success in meeting local needs depends on a meaningful process of social consultation and deliberation. This should actively involve stakeholders, rather than being a purely technical or administrative process.

Balance central regulations on class and school sizes with the need to maintain high-quality provision in small schools and remote areas

While the regulation of school and class sizes can play an important role in the governance of school networks, it is important to bear in mind that there is no "one size fits all" solution and that maintaining high-quality provision in small schools and remote areas should be a priority. Even though incentives for municipalities to create larger schools may improve educational quality and efficiency in some contexts, enforcing a lower bound to school sizes may be unfeasible in geographically isolated areas. Authorities should therefore consider exempting certain schools from class size requirements if they are identified as meriting protected status to avoid placing student in remote areas at a disadvantage. In addition, thresholds should reflect the pedagogical requirements of students in different age groups and take into account the special attention required, for example, by disadvantaged students or those with SEN.

Given that students' grade level, social background and educational needs can mediate the effects of school and class size, policy makers need to carefully consider which student populations will benefit or suffer from the respective reforms. Changes in size policies should be conducted through an open and transparent process that permits the participation of the affected communities, and that clearly presents the arguments for the proposed changes. Especially in systems with a tradition of local autonomy, communities should assume an active role in restructuring the school network and developing context-specific strategies to improve the efficiency of their local provision. Central authorities can therefore play a vital role not only through the use of regulatory steering mechanisms, but also by encouraging local reflections on ways to improve both economic efficiency and school quality through school network planning.

Devise student assignment mechanisms that respect parental preferences without compromising equity

Student assignment mechanisms play an important role in determining how the demand for school places is distributed across the network. While many OECD review countries, particularly for younger students, continue to use some form of initial assignment method based on students' residence, parental choice plays an increasingly important role. Although strict geographic assignment based on catchment areas risks to reproduce residential segregation patterns in schools, the introduction or expansion of school choice is not guaranteed to benefit the most disadvantaged students. Instead, poorly-designed choice schemes have often exacerbated the inequities they were designed to redress and led to increased socio-economic segregation across schools.

Disadvantaged families are less likely to make use of school choice, and where they do, often engage in the process less effectively because they lack the time, resources or information to identify and select the highest quality schools. Reducing the complexity of school choice schemes by ensuring that deadlines, admissions and enrolment procedures are homogenous across schools and by expanding the availability and accessibility of contextualised information on the quality of schools and the school choice process itself can reduce some of the barriers experienced by disadvantaged families.

To ensure that the advantages of school choice accrue to families across the socio-economic spectrum, the criteria used by oversubscribed schools to select their incoming cohort should be monitored and regulated to prevent "cream skimming" practices. This includes regulating admission procedures to ensure that subsidised private

providers adhere to the same standards of selection as public providers and do not charge add-on tuition fees that might exclude disadvantaged students from attending publicly funded schools. Standards for admission and tuition practices should be designed to create an even playing field between public and subsidised private schools to reduce the risk of socio-economic segregation and incentivise schools to compete on the basis of quality rather than selectivity.

Different forms of "controlled choice" have also shown to be effective in reducing high levels of student segregation, for example by reserving a given number or share of places in oversubscribed schools to students of different socio-demographic backgrounds to maintain a balanced distribution of students. Engaging school communities in the definition of these criteria and allowing for local variation can ensure that they are sensitive to local context and can significantly ease their implementation. Given their complexity, controlled choice systems may require a certain degree of centralisation to minimise administrative costs and prevent problems like multiple registrations. They also depend on sufficient administrative capacity to collect and manage the data needed to allocate students to schools.

Since geographic assignment remains an important aspect of many review countries' student allocation system, the design of catchment areas is an important steering tool that can be used to advance both equity and the efficient organisation of the school network. Given its sensitive nature, the definition and reform of catchment areas should involve local actors wherever possible and central authorities should provide them with the tools they need to competently evaluate the merits of different scenarios. Efforts should be undertaken to consider the equitable distribution of students and avoid segregation, e.g. by combining districts with different socio-demographic characteristics within a catchment area. At the same time, where rationalisation is a pressing issue and financial disincentives prevent small municipalities from consolidating or sharing facilities, expanding the size of catchment areas beyond municipal boundaries can be an effective means to initiate reflections on the efficient organisation of the school network.

Ensure that the entry of both public and private providers into the school network is based on assessed quality and need

Regulating the creation and funding of new schools serves not only to ensure a high quality of educational provision, but also constitutes a powerful steering tool to support the rational organisation of the school network. Licensing procedures that are misaligned with policy priorities for the school network can diminish its efficiency and reduce the scope for strategic planning. Particularly an insufficiently regulated licensing process for government-dependent private providers can contribute to increasing per-student costs, add to the fragmentation of school networks, and in some cases undermine public efforts to rationalise them.

To address efficiency concerns raised by the entry of new providers, the decision whether or not to fund them should be transparent and take into account an assessment of both quality and needs. Only services of proven quality should be allowed to operate and - particularly in areas with excess capacity – only those that respond to an identifiable need should benefit from public funding. Authorities could, for example, require schools to demonstrate a sufficient number of classes above a certain size before they are included in the network of publicly funded schools. When assessing the need for specific types of provision, decision makers should strive to take into account the views of relevant stakeholders. The licensing process for new vocational schools or accreditation

of new programmes, for example, might involve the consultation of social partners to assess the need for the proposed offerings in light of both labour market demands and the existing provision. Any such needs- and quality-based procedures for the creation of new schools need to live up to high standards of transparency and must be supported by the development of relevant standards and effective tools to analyse quality as well as current and future needs. Reforming licensing procedures along these lines may also require capacity building for the school authorisers expected to implement them.

Ensure equitable access to capital funds and support the efficient management of investment projects at the local level

In many education systems, the allocation mechanisms for capital funding demand both technical capacity and experience on the part of local authorities and schools. Particularly small and disadvantaged schools often lack the resources and trained personnel to successfully bid for capital funding, which threatens to undermine the balanced distribution of infrastructural investment and risks exacerbating inequities in the school network. Some regional and local authorities also lack the capacity to successfully deliver infrastructural programmes and ensure that contractors or external organisations tasked with the management of projects deliver on their contract obligations.

Particularly in systems without a long-lasting culture of local autonomy, the actors involved in overseeing or managing capital investments should benefit from strong support mechanisms and relevant professional development programmes emphasising the skills needed to ensure value for money in construction works. Competency frameworks used to guide recruitment processes for local leaders and administrators should also reflect these responsibilities (OECD, 2017, p. 90[2]). Efforts to improve local capacity can leverage the wider institutional settings in which local authorities are embedded. This might involve building on existing co-ordination structures or collaborative ties among local authorities to facilitate peer-learning or support-networks and provide training and capacity building to larger groups of administrators. This could extend to sharing administrative resources, for example by jointly employing staff specialised in monitoring and planning the school network and overseeing infrastructural investment projects.

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Annex 2.A. Mechanisms for capital funding

Annex Table 2.A.1. Mechanisms for the distribution of capital expenditure

Country	Level of education	Governance		Allocation mechanism						Basis for allocation				
		Funding authority	Level of recipient	Ad hoc grant	Infrastructure investment programme	Annual grant	Earmarked grant	Negotiated process	Discretionary funding	Admin. discretion	Negotiated Process	Assessment of needs	Competitive basis	Other or not specified
Austria (1)	ISCED 0 and ISCED 1-3 (state schools)	State and local	School	✓	✓					✓		✓		
		Central	State				✓				✓			
	Secondary (federal schools)	Central	School		✓							✓		
Belgium (Fl.)	All levels	Dedicated agency	School provider	✓						✓				
		Dedicated agency	School provider		✓					✓				
Belgium (Fr.)	All levels	State	School	✓						✓				
		State	School provider			✓								✓

Country	Level of education	Governance		Allocation mechanism						Basis for allocation				
		Funding authority	Level of recipient	Ad hoc grant	Infrastructure investment programme	Annual grant	Earmarked grant	Negotiated process	Discretionary funding	Admin. discretion	Negotiated Process	Assessment of needs	Competitive basis	Other or not specified
Chile	Early childhood	Central	Regional						✓				✓	
	All levels except ISCED 01	Central	School		✓								✓	
	Secondary (VET)	Central	School			✓							✓	
Czech Republic	All levels	Central	School		✓							✓		
		Regional and local	School	✓		✓				✓		✓		
Denmark	All levels except upper secondary	Local	School						✓	✓				
	Upper secondary	Central	School			✓		✓						✓

Country	Level of education	Governance		Allocation mechanism						Basis for allocation				
		Funding authority	Level of recipient	Ad hoc grant	Infrastructure investment programme	Annual grant	Earmarked grant	Negotiated process	Discretionary funding	Admin. discretion	Negotiated Process	Assessment of needs	Competitive basis	Other or not specified
Estonia	Early childhood	Dedicated agency	School provider		✓							✓		
	All levels	Local	School	✓								✓		
		Central	School provider		✓								✓	
Iceland	Early childhood	Local	School						✓			✓		
	Primary and lower secondary	Local	School					✓				✓		
	Upper secondary	Central and local	School						✓	✓				
Israel	All levels	Central	School	✓								✓		
		Local	School	✓								✓		
Kazakhstan	All levels	Central	School				✓			✓		✓		
		All levels	School	✓				✓	✓	✓		✓		

Country	Level of education	Governance		Allocation mechanism						Basis for allocation				
		Funding authority	Level of recipient	Ad hoc grant	Infrastructure investment programme	Annual grant	Earmarked grant	Negotiated process	Discretionary funding	Admin. discretion	Negotiated Process	Assessment of needs	Competitive basis	Other or not specified
Lithuania	All levels	Central	Local		✓									✓
		Local	School	✓								✓		
		Local	School						✓	✓				
Portugal (2)	Early childhood and primary	Local	School provider		✓							✓		
	Primary and lower secondary	Central	School provider	✓								✓		
	Upper secondary	Dedicated agency	School provider		✓							✓		
	Upper secondary	Dedicated agency	School provider	✓								✓		
	All levels except early childhood	Central	School provider	✓								✓		
Slovak Republic	All levels except ISCED 01	Central	Regional and local		✓					✓		✓		
	All levels except early childhood	Central	Regional and local				✓			✓		✓		
		Regional and local	School providers						✓	✓				

Country	Level of education	Governance		Allocation mechanism						Basis for allocation				
		Funding authority	Level of recipient	Ad hoc grant	Infrastructure investment programme	Annual grant	Earmarked grant	Negotiated process	Discretionary funding	Admin. discretion	Negotiated Process	Assessment of needs	Competitive basis	Other or not specified
Slovenia	All levels except upper secondary	Central	Local						✓	✓				
	All levels	Local	School						✓	✓				
	Upper secondary	Central	School						✓				✓	
Spain	Early childhood and primary	Local	School				✓					✓		
	All levels	Regional	School	✓			✓			✓		✓		
		Regional	School		✓							✓		
Sweden	All levels	Local	School		✓									✓
		Local	School	✓								✓		

Country	Level of education	Governance		Allocation mechanism						Basis for allocation				
		Funding authority	Level of recipient	Ad hoc grant	Infrastructure investment programme	Annual grant	Earmarked grant	Negotiated process	Discretionary funding	Admin. discretion	Negotiated Process	Assessment of needs	Competitive basis	Other or not specified
Uruguay	All levels	Central	Councils					✓						✓
		Central	School		✓					✓		✓		
	Early childhood and primary	Central	School						✓			✓		
		Central and regional	School					✓				✓		
	Primary	Central	School		✓									✓
	Primary and secondary	Dedicated agency	School						✓	✓				
	Lower and upper secondary	Central	School						✓	✓				
		Central	School		✓									✓
		Central	School	✓						✓		✓		

Notes: Funding for capital expenditures intend to cover spending on assets that last longer than a year. It includes funds for construction, renovation or major repairs to buildings (immovable) as well as on new or replacement equipment (e.g. furniture, laboratory equipment, computers, etc.), except where noted otherwise. Depending on national conventions, funding for maintenance works may be partially or completely allocated through current expenditure mechanisms.
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, levels of administration and funding allocation mechanisms, see Annex A. For country-specific notes to this table, see the end of this annex.
1: Transfers from the central to the state level in Austria refer to funding for federal policy priorities, in particular the expansion of all-day schooling. The funding is part of a one-off programme based on temporary agreements between the central authorities and the states. These transfers are therefore not considered part of Austria's regular capital funding mechanisms.
2: Information on funding mechanisms in Portugal refers to the continental territory. The autonomous regions of Madeira and Azores autonomously legislate on matters related to their respective education systems.
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.

Country notes

Austria

***Capital expenditure (ISCED 0-3)*:** The responsibility for capital expenditure in early childhood education and care (ISCED 0) lies with the state or private providers (e.g. associations or churches). For school education (ISCED 1-3), the main responsibility for capital expenditure lies with the owner of the school. For state schools, most tasks associated with the provision and maintenance of schools have in practice been devolved to the municipal level, including the provision of school buildings, infrastructure and non-teaching staff, such as janitors. States typically support municipalities in carrying out these duties by administering allocated funds and have retained their responsibility for vocational, agriculture and forestry schools at the upper secondary level (ISCED 3). In the case of federal schools, as a general rule, the Federal Ministry of Education, Science and Research is responsible for providing and maintaining the school infrastructure. A large share of school buildings at this level (around 320) have been outsourced and are administered and maintained by the Federal Real Estate Company (*Bundesimmobiliengesellschaft*), owned by the Federal Republic of Austria. Buildings are rented by the ministry. Some school buildings of federal schools are owned by other proprietors, mainly municipalities and social partners. Regular funding for current expenditures at all levels of the education system also includes some funds for maintenance and small investments.

Ad hoc grants and infrastructure investment programmes from state and local authorities (ISCED 0, ISCED 1-3 state schools): The state governments operate investment programmes to support municipalities in the construction and renovation of state schools. The adequacy of school infrastructure is subject to state legislation and comprises detailed guidelines concerning the construction and equipment for specific types of schools. The suitability of planned infrastructure is assessed by expert commissions.

Infrastructure investment programme from the central authority (ISCED 2-3 federal schools): The federal government has adopted a long-term school development programme (*Schulentwicklungsplan*) for the decade 2008-18. The programme focuses on the modernisation of existing infrastructure and school buildings to provide students and teachers with adequate classrooms and workplaces. Investments are transferred to the owners of the school buildings (i.e. the Federal Real Estate Company or others, primarily municipalities) in the form of increased rental payments.

Belgium (Fl.)

Access to capital funding is organised through two public agencies. A dedicated public body, GO! Education of the Flemish Community, funds the creation or improvement of buildings in the Flemish Community school network as public assets. The Agency for Educational Infrastructure (*Agentschap voor Infrastructuur in het Onderwijs*, AGIOn) finances building works in grant-aided public schools (municipal and provincial) as well as publicly subsidised private schools, covering 70% of their capital requirements at the primary level and 60% at the secondary level. The unsubsidised balance can be covered with the help of state-guaranteed loans and the assets remain privately owned for publicly-subsidised private schools and owned by the local authorities in the case of grant-aided public schools). By contrast, Community schools receive funding to cover

100% of their capital costs. In addition, there is the possibility of public-private partnerships.

Belgium (Fr.)

Public schools receive capital funding through a school building fund. Publicly-subsidised private schools do not receive resources from this fund, but they are granted a capital repayment guarantee for expenditures related to the construction, renovation, modernisation and expansion of schools (Decree 05/02/1990). A priority programme of works (*Programme prioritaire de travaux*, PPT) makes it possible to remedy essential needs by allocating funds for emergency works to all school providers. The French Community covers 70% of capital funding needs at the primary level and 60% at the secondary level, while the school providers cover the remaining balance (Decree 16/11/2007).

Chile

School providers are responsible for managing their infrastructure's maintenance and capital investments. Funding for maintenance activities is distributed through the school grant system whose Grant for Maintenance Support (*Subvención de Apoyo al Mantenimiento*) aims to support the conservation of subsidised schools, including their equipment and furniture. This includes an annual allocation of funds calculated on the basis of the Basic Grant.

***Infrastructure investment programme from the central authority (ISCED 02-3)*:** In the public sector, the main source of infrastructure investment remains the central government. The National Regional Development Fund (*Fondo Nacional de Desarrollo Regional*, FNDR) is an important element of the government's investment strategy and distributes additional resources detailed in each year's Budget Law. The funds are transferred to the regions to promote investment in priority areas defined at the national level, including education with the Fund for Educational Infrastructure (*Fondo de Infraestructura Educacional*, FIE).

Denmark

For early childhood education and public primary and lower secondary institutions, the allocation of capital funding is at the administrative discretion of municipalities. Private schools at ISCED 1-3 receive an activity-based "building/capital" grant from the central authorities. Public upper secondary schools also receive an activity-based "building/capital" grant and own their own buildings, allowing them to finance capital expenditures through commercial loans. If the school board makes capital dispositions for more than DKK 60 million, they have to be approved by the Ministry of Education.

Estonia

Infrastructure investment programmes run by dedicated central-level agencies support local authorities in the creation of new pre-school places. Key agencies are Enterprise Estonia (*Ettevõtluse Arendamise Sihtasutus*, EAS), which is responsible for promoting business and regional development and co-ordinates the implementation of EU structural funds and the Innove Foundation, which is responsible for implementing relevant projects in the area of lifelong learning and for mediating EU structural funds.

Iceland

Schools can use a portion of their general block grant to cover capital expenditures. In pre-primary and compulsory education (ISCED 0-2), local authorities are entirely responsible for capital expenditures. For upper secondary schools (ISCED 3), construction costs and initial capital investments for equipment are generally divided between the central government and the relevant municipalities based on a negotiated settlement between central and local authorities. The central government and the relevant municipalities pay 60% and 40% respectively. There are no formal provisions for funding the capital expenditure of private schools at any level.

Israel

Multi-year plans for the construction of schools and classrooms are based on forecasts of student numbers and any identified infrastructure shortages. The Ministry of Education participates in planning the budget using the number of classes and corresponding price charts as criteria. Local authorities are responsible for the execution of the budget.

Kazakhstan

Funding for capital expenditures in schools is mainly guaranteed by ad hoc decisions and discretionary funding, giving priority to schools with the greatest identified need based on defined priorities. According to the State Programme for Education and Science Development for 2016-19, the top priorities are to decrease the number of schools that provide triple-shift education, to reduce the shortage of school places and to decrease the number of schools that are classified as being in state of emergency.

Lithuania

Most of the funding for investments in school infrastructure comes from dedicated central government grants and the EU Structural Fund, supplemented by local government funding. These funds are mainly allocated to the development of vocational training centres, the establishment of multi-functional centres in rural locations, investments in pre-school education and the upgrading of technology, natural sciences and art facilities in general education.

Slovak Republic

***Infrastructure investment programme from the central authority (ISCED 02-3)*:** The central infrastructure programme focuses on the expansion of school capacity through new constructions or the extension of existing infrastructure, particularly in areas where schools have introduced double shifts in response to demographic pressures. Between its launch in 2013 and 2016, the programme created additional capacity for more than 6 000 students. A similar infrastructure programme has been started to extend the capacity of kindergartens by 5 000 places.

Slovenia

At ISCED levels 0-2, and in exceptional cases also at ISCED level 3, local authorities are responsible for funding infrastructure construction, renovation and maintenance, non-instructional and instructional materials. In schools of the Italian and Hungarian national communities, the central level covers 100% of the capital investment.

Uruguay

Schools' regular funding for current expenditure includes funds for maintenance and small investments. In addition, the central authority manages several infrastructure investment programmes for schools from the primary to upper secondary level: The Support Programme for Public Primary Education (*Programa de Apoyo a la Escuela Pública Uruguaya*, PAEPU), funded by the World Bank, supports full-time schools with infrastructure and equipment. The Support Programme for Secondary Education and Training in Education (*Programa de Apoyo a la Educación Media y Técnica y a la Formación en Educación*, PAEMFE), funded by the Inter-American Development Bank, supports infrastructure and equipment in secondary education and teacher training institutions. Both PAEMFE and PAEPU are administered by the National Public Education Administration (*Administración Nacional de Educación Pública*, ANEP).