

State Funding for School Ventilation

A Review of Selected Policies, 2020-2022



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Introduction

Since the COVID-19 pandemic reached the U.S. in 2020, there has been more public awareness and discussion of building ventilation and indoor air quality (IAQ) issues than ever before. Now, nearly three years into the public health crisis, it is well understood by infectious disease scientists—and widely recognized by national, state, and local public health and policy officials—that ventilation is an essential strategy for reducing SARS-CoV-2 transmission.¹ In addition to reducing transmission of airborne infectious diseases, proper ventilation helps reduce exposure to a wide range of common indoor pollutants.²

The pandemic has also highlighted the inability of many U.S. schools to achieve good ventilation and indoor air quality. On the American Society of Civil Engineers' annual infrastructure report card, public school facilities received a grade of D+ in 2021.³ A report by the Government Accountability Office estimated that as of late 2019, over 40 percent of school districts needed to upgrade or replace the HVAC systems in at least half of their schools—meaning over 35,000 public schools were in need of HVAC updates at the start of the COVID-19 emergency.⁴

One part of a successful strategy to sustain progress toward widespread improvement of indoor environmental quality in existing school facilities is adoption of state policies that increase the ventilation and filtration requirements that apply to school buildings. ELI's January 2023 research report, *Ventilation in Schools: A Review of State Policy Strategies*, focuses on state policies establishing effective, enforceable ventilation and filtration requirements for schools.⁵ Funding for school ventilation improvements is another key step in ensuring that schools are equipped to provide good ventilation and indoor air quality. As described in this paper, state policies providing targeted funding and technical assistance specifically for school HVAC have an important role to play, especially for realizing improvements in low-wealth, rural, and other historically underserved communities.

The 2021 State of Our Schools report estimated an \$85 billion gap in school facilities funding across the U.S.⁶ Since funding for ventilation and other capital improvements and repairs are largely the responsibility of local school districts, the problem is not distributed evenly. The 2021 State of Our Schools report underscored the disparities in school facility funding based on districts' community wealth, geography, and student race and ethnicity: low poverty (i.e., higher-wealth) districts spend

¹ See Lancet COVID-19 Commission, *The First Four Healthy Building Strategies Every Building Should Pursue to Reduce Risk from COVID-19* at 1 (July 2022), <https://tinyurl.com/387pzrua>.

² See U.S. Environmental Protection Agency (EPA), *Ventilation and Coronavirus (COVID-19)*, <https://tinyurl.com/2p8w7em9>.

³ See Amer. Soc. of Civil Engineers, *2021 Report Card for America's Infrastructure* at 116, <https://tinyurl.com/mr39vvyz>.

⁴ See U.S. Govt. Accountability Office (GAO), *K-12 Education: School Districts Frequently Identified Multiple Building Systems Needing Updates or Replacement* (GAO-20-494, June 2020) at 1, <https://www.gao.gov/assets/gao-20-494.pdf>. According to the report, an estimated 54 percent “need to update or replace multiple building systems or features in their schools.” See also W. Fisk, *The Ventilation Problem in Schools: Literature Review* at 1, *Indoor Air* 27 (2017) (finding “ventilation rates in classrooms often fall far short of the minimum ventilation rates specified in standards”), <https://tinyurl.com/2p85xd46>.

⁵ The report is available at <https://www.eli.org/buildings/ventilation-schools>.

⁶ 21st Century School Fund et al., *2021 State of Our Schools* at 12, <https://www.wellcertified.com/state-of-our-schools> [hereinafter “2021 State of Our Schools”].

considerably more on school capital investment, maintenance, and operations than medium- and high-poverty districts; in every income group, rural districts have had lower average funding per school than non-rural districts; and Native American, Black, and Hispanic students are “disproportionately represented in schools with lower facilities investments and maintenance and operations spending.”⁷

In 2020 and 2021, the U.S. Congress passed multiple pandemic-related funding bills that included a historic federal investment in schools. Several of the funding streams established through the CARES Act, the American Rescue Plan Act, and other pandemic-related appropriations have been sending billions of dollars to state and local governments that must or may be spent on schools.

In general, the major federal funding programs for states’ pandemic response and economic recovery have been broad and flexible, allowing recipient jurisdictions to allocate the federal assistance according to their own priorities. (See Source of Program Funding, below). Key federal pandemic funding programs for schools authorize using the funds for improving ventilation and indoor air quality inside school facilities, among other possible expenditures. Many school districts have used or are planning to use some of these funds to make ventilation-related improvements that enable safer reopening and improve IAQ during normal operations.⁸ Nevertheless, because school districts have many competing priorities that are eligible for these temporary federal programs, this infusion of funding is only part of any long-term solution to improve ventilation in schools, in response to the ongoing COVID-19 pandemic and beyond.

Opportunities exist for states to develop their own targeted programs to explicitly allocate a portion of their federal pandemic response funds and/or other funding sources to local education agencies for HVAC improvements in school buildings. By attaching minimum technical requirements and/or providing technical assistance and recommendations, state programs can incentivize schools to implement the ventilation and filtration practices known to reduce COVID-19 risk and improve school indoor air quality generally.

This paper describes and illustrates how some states recently have used legislation, administrative rules, and agency guidance to establish and implement dedicated funding programs for school ventilation projects to help schools achieve significant, equitable reductions of the health risks associated with inadequate ventilation and filtration. The discussion includes examples of prominent state policies using federal or state funds to establish new funding programs or otherwise allocate funds specifically for ventilation assessment, maintenance, repair, replacement, and/or installation projects in schools. The paper is not an exhaustive compilation of these state policies, and it does not cover how school districts have used their ARP/ESSER funds on ventilation/filtration improvements.

All of the policies and programs highlighted in this section were enacted, amended, or adopted between 2020 and 2022. While not necessarily COVID-specific, the policies were motivated by the pandemic and reflect a growing recognition of inadequate school ventilation as a widespread problem in the U.S.

⁷ Id. at 38-40, 55.

⁸ According to a CDC survey on ventilation improvements in public schools during the pandemic, a majority of schools used pandemic funds for inspecting their HVAC systems, and a smaller proportion reported more resource-intensive strategies such as replacing or upgrading HVAC systems (38.5 percent) or using HEPA filtration systems in classrooms (28.2%) or in eating areas (29.8 percent). S. Pampati, et al., Ventilation Improvement Strategies Among K–12 Public Schools – The National School COVID-19 Prevention Study, United States, February 14–March 27, 2022, MMWR Morb Mortal Wkly Rep 71:770–775 (2022), <https://www.cdc.gov/mmwr/volumes/71/wr/mm7123e2.htm>.

Several of the policies and programs also reflect increasing public and political recognition of historic disadvantage and systemic inequalities – which include underserved communities’ disparate access to resources for maintaining and improving school facilities – by prioritizing the equitable distribution of their available funds.

The following table summarizes the policies reviewed here and provides citations for each. Any additional sources of information are noted throughout the paper.

State Policies Described in the Paper	
Area of Authority and Citation	Policy/Program Highlights
CALIFORNIA	
<p>PUBLIC UTILITIES Ca. Pub. Util. Code §1600 et seq.</p>	<p>CalSHAPE Ventilation is a new grant program, created by legislature in 2020 (A.B. 841), through which the California Energy Commission will award around \$584 million in total to public school districts and charter schools. The focus of the initial phase of the program is assessment and maintenance of HVAC systems to improve functioning and to identify any deficiencies, with a small portion of the funds available for repairs. The legislation includes detailed technical standards and specifications for projects carried out with program funds, which come from the large electric and gas utilities’ energy efficiency budgets. At least 25 percent of projects must be located in underserved communities (and additional priority is given to schools located near certain sources of air pollution).</p>
<p>EDUCATION Ca. Educ. Code §§43521-22</p>	<p>California Assembly Bill 86 (2021) appropriated \$2 billion from the state general fund for formula-based “In-Person Instructional Grants” to local education agencies. Grants may be used for “any purpose consistent with providing in-person instruction,” including ventilation “and other school upgrades for health and safety.”</p>
COLORADO	
<p>EDUCATION Co. Stat. §§22-43.7-101, et seq.; 1 Co. Code Regs. §303-3</p>	<p>The Building Excellent Schools Today (BEST) program, created by law in 2008 and administered by the Public School Capital Construction Assistance Board and the State Board of Education, is a competitive grant program that makes awards from the state’s public school capital construction assistance fund (which is funded by the state’s recreational marijuana tax, lottery, and other state sources). Generally requiring a 50 percent local cost share, BEST grants are for projects that address health concerns at existing public schools, including but not limited to ventilation and filtration improvements. In 2021, in response to the pandemic, the administering agency provided emergency BEST grants for ventilation and filtration improvements. The same year, the legislature also appropriated \$10 million for portable air cleaners and HVAC filters (Co. S.B. 21-202).</p>

CONNECTICUT	
<p>ADMIN. SERVICES Ct. Public Act 22–118, §367 (2022)</p>	<p>A Connecticut state budget bill established a new grant program to reimburse local and regional boards of education for “costs associated with projects for the installation, replacement or upgrading of heating, ventilation and air conditioning systems or other improvements to indoor air quality in school buildings...” Among other eligibility criteria, to receive a grant, a local or regional board of education must comply with the requirement established under separate legislation to perform a five-year uniform inspection and evaluation of the HVAC system. The law also provides that grantees “shall be responsible for the routine maintenance and cleaning of the [HVAC] system” and must “provide training to school personnel and building maintenance staff concerning the [system’s] proper use and maintenance.”</p> <p>The bill allocated \$75 million from the state’s American Rescue Plan (ARP) funds to the school IAQ grant program—which will be administered by the Department of Administrative Services—for fiscal year 2023 and also authorized the State Bond Commission to issue up to \$75 million in bonds to provide “grants-in-aid for school air quality improvements,” including but not limited to HVAC projects (with a maximum of \$50 million of the bond proceeds to be used for reimbursements for projects completed before July 2022).</p>
MARYLAND	
<p>EDUCATION Md. Educ. Code §5-322</p>	<p>The Healthy School Facility Fund, first established by the legislature in 2018 provides competitive grants to public schools for capital projects that will improve the health of school facilities, including but not limited to HVAC and IAQ projects. The Interagency Commission on School Construction prioritizes awards based primarily on severity of an immediate life, safety, or health risk. During the COVID-19 pandemic, the legislature extended the program’s duration and increased the mandatory annual appropriation; the fund is currently authorized through at least 2026, with annual appropriations of at least \$90 million starting in 2024.</p> <p>A 2021 state budget bill (H.B. 588) allocated \$40 million in federal pandemic relief money to the fund for each of fiscal years 2022 and 2023. Per the authorizing law, at least 50 percent of funds must be awarded to public schools in the city of Baltimore.</p>
MASSACHUSETTS	
<p>EDUCATION Mass. Acts 2021, Chapter 102</p>	<p>A 2021 state appropriations law established a \$100 million reserve fund for grants to public school districts to address inequitable school facilities’ needs and repairs for improved ventilation and IAQ in districts and schools with high concentrations of economically disadvantaged students. Eligible expenditures include inspections, maintenance, installation, repairs, or upgrades for heating, ventilation and air conditioning systems. The funds, which were allocated from the state’s federal pandemic relief, are being administered by the Department of Elementary and Secondary Education.</p>

MICHIGAN	
<p>ENVIRONMENT Mich. Dept. of Environment, Great Lakes, and Energy State Energy Program, K-12 Public School HVAC Assistance Program</p>	<p>Michigan’s K-12 Public School HVAC Assistance Program was established by and within the Department of Environment, Great Lakes, and Energy (EGLE) State Energy Program in 2020, utilizing leftover federal stimulus funds to pay licensed professionals to perform school HVAC assessments, at no cost to the schools. The HVAC inspection checklist was developed by the agency in collaboration with ASHRAE and was used to provide a record of the current status of the school’s HVAC conditions and make recommendations for improvements. The program, which ended in 2021, spent over \$260,000 on the assessments.</p>
NEVADA	
<p>EDUCATION Nv. Rev. Stat. §§393.390 et seq. Nv. A.B. 257 (2021)</p>	<p>This legislation, in effect until July 2023, did not establish funding for school ventilation, but rather established new statewide standards for public school ventilation and IAQ that apply to any school ventilation or IAQ project carried out with state or federal funding. The requirements incorporate standards for filter efficiency and ventilation rates and address service provider qualifications, CO₂ monitoring, and reporting.</p>
NEW JERSEY	
<p>PUBLIC UTILITIES N.J. Stat. §48:3-106.1 (2021 Sen. Bill 3995)</p>	<p>This legislation established—and allocated a portion of the state’s federal pandemic relief money for—the School and Small Business Ventilation and Energy Efficiency Verification and Repair program, administered by a contractor on behalf of the Board of Public Utilities. Grants may be used to reimburse reasonable costs of an HVAC assessment, assessment report, deferred general maintenance, adjustment of ventilation rates, filter replacement, system replacement, and CO₂ monitor installation.</p> <p>The law requires that 75% of the approximately \$100 million available for school ventilation be awarded for projects in underserved communities (though an existing state budget law allows funding to be shifted where necessary based on demand).</p>
VERMONT	
<p>EDUCATION Vt. 2020 Acts and Resolves Nos. 120, 154; Vt. 2021 Acts and Resolves No. 9</p>	<p>This 2020 legislation established, and allocated \$18 million in federal pandemic assistance for, a new School and Indoor Air Quality Grant Program. Administered by a non-profit efficiency utility, the program provided technical assistance and financial support for ventilation improvements in public and independent schools. In 2021, the legislature appropriated an additional \$15 million of the state’s federal pandemic response money to implement a second round of the program, which will last through 2024. Priority for funding awards was based on mechanical ventilation needs and economic and geographic equity criteria.</p>

VIRGINIA	
EDUCATION Va. House Bill 7001, 2021 Special Session II of General Assembly	This legislation appropriated \$250 million of the state’s federal pandemic relief funds for direct formula grants to local education divisions (counties) for improving ventilation systems in public school facilities, in accordance with ARP guidelines. The funds were allocated to counties in proportion to their student enrollment counts and were administered by the Virginia Department of Education, which announced in January 2022 that all final grant awards had been made based on the costs of activities described in each county’s application (which could not exceed the formula allotment), totaling around \$220 million. The grants included a 100 percent local match requirement, and all reimbursable costs must be incurred by the end of 2024.

Nevada’s 2021 legislation did not create a new funding program or otherwise allocate money for school ventilation. It is included here because it takes the unusual approach of establishing requirements that *apply if and when* a school district (or charter school) receives state or federal money and (1) allocates such money to equip a public school with functional ventilation systems or improve ventilation systems or indoor air quality in a public school; or (2) as a condition of receiving state or federal money, is required to ensure a public school is equipped with functional ventilation systems or improve ventilation systems or indoor air quality in a public school. The law is in effect until July 2023.

Key Elements of School Ventilation Funding Policies

Administrative Authority

Among the states that have established funding processes targeting school ventilation/filtration improvements since March 2020, there is some variation in the policy mechanisms used to authorize the funding. Most of the programs described here involved an authorization by the state legislature, though the laws were far from uniform in their approach to channeling funds to schools. In two states, agency-driven assistance programs demonstrate how in some circumstances, agency staff have taken initiative to establish targeted school ventilation programs during the pandemic, even without new legislation.

Policies Establishing New Programs. A straightforward way for a state to set up a targeted funding stream for school ventilation/filtration improvements is for the legislature to enact a law authorizing a new grant program. For example, in 2020 the California legislature – noting the absence of any existing program “dedicated to improving ventilation...in California schools at the scale required to safely prepare schools for operating during the COVID-19 pandemic” – adopted Assembly Bill 841 to establish a major school Heating, Ventilation, and Air Conditioning (HVAC) assessment and improvement program, known as the CalSHAPE Ventilation Program.⁹ Other examples include New Jersey, where Senate Bill 3995 established a new School and Small Business Ventilation and Energy Efficiency Verification and Repair fund in 2021, and Vermont, where Act 120 created a new School and Indoor Air Quality Grant Program in 2020. This approach carries the advantage of allowing a state to tailor the

⁹ For more on the studies and analysis on which the AB 841 program was based, see Christopher Ruch, Natl. Energy Mgmt. Inst. and Theresa Pistochini, UC Davis Energy and Efficiency Inst., White Paper: Proposed Ventilation and Energy Efficiency Verification/Repair Program for School Reopening (July 2020), <https://tinyurl.com/2bx8vf9x>; see also Natl. Energy Mgmt. Inst. Committee, “California schools’ indoor air quality the focus of NEMI, UC Davis white paper,” (2020), <https://tinyurl.com/m75yb46u>.

program to meet a new, specific priority; however, the time and resources required to stand up a new program can be considerable and could potentially delay the implementation of eligible projects that were intended to address emergent needs.

Running Targeted Funds through an Existing Grant Program. As an alternative to establishing an entirely new program, a state legislature or agency could dedicate funds to be administered through an existing grant program for a special purpose. This was the approach taken during the pandemic in Maryland, where the state’s annual budget bill (H.B. 588) appropriated \$40 million to the Interagency Commission on School Construction (IAC) for the specific purpose of “provid[ing] funding for heating, ventilation, and air conditioning upgrades for public school buildings to be allocated among school systems using the same criteria as the Healthy School Facilities Fund [HSSF]...”¹⁰ The HSFF was originally established by the state legislature in 2018 as a temporary school capital grant program intended “to improve the health of school facilities” by addressing issues including, but not limited to, air conditioning, heating, and indoor air quality. The original law establishing the HSFF (S.B. 611) authorized a mandatory appropriation of \$30 million per year for fiscal years 2020 and 2021. Just before the pandemic began, H.B. 1 (2020) extended the mandatory appropriation through 2024 and increased it \$40 million per year; in early 2022, the legislature extended the program through 2026 and more than doubled the mandatory annual appropriation (to \$90 million) beginning in FY 2024 (H.B. 1290).

A similar approach was used in Colorado, where the Capital Construction Assistance Board (CCAB) acted to provide targeted grants using existing legislative authorization. The CCAB is a dedicated entity within the state’s Department of Education responsible for making recommendations to the Colorado State Board of Education on prioritization and allocation of state financial assistance for school construction projects.¹¹ Since the state’s Building Excellent Schools Today Act (BEST) grant program was established by law in 2008, the agency has annually awarded competitive grants to public schools for capital construction projects addressing health concerns, including but not limited to ventilation and filtration improvement projects.¹² The BEST statute also authorizes “emergency grants” and defines “public school facility emergency” as an unanticipated event that makes all or a significant portion of a public school facility unusable for educational purposes or threatens the health or safety of persons using the public school facility. In 2021, the CCAB invoked this existing statutory authority to award emergency grants for the exclusive purpose of “improving ventilation and filtration systems” in public schools during the COVID-19 pandemic.¹³

Selecting an Agency to Administer the Funding. Another important feature of program authorization is which agency administers the funding to local education agencies (LEAs).

State education agencies typically have experience in administering other types of state and federal funding to school districts and may have the advantage of existing infrastructure (e.g., IT systems for applications and grant administration) and prior contacts with school districts. This may help make the implementation of a new school-focused grant program more efficient. Massachusetts and Virginia are examples of states where targeted funds for school ventilation were appropriated to the state Department of Education for distribution to local educational entities. As noted above, in Colorado

¹⁰ 2021 Md. Laws Ch. 357 (H.B. 588). The same bill also added \$40 million to a “dedicated purpose account” to support heating, ventilation, and air conditioning upgrades for public school buildings in Fiscal Year 2023.

¹¹ Co. Stat. § 22-43.7-106.

¹² See generally Colorado Dept. of Educ., BEST Grant Program, <https://www.cde.state.co.us/capitalconstruction/best>.

¹³ See Colorado Dept. of Educ., Capital Construction Assistance Board—Emergency Grants in Response to COVID-19, <https://tinyurl.com/yckz759r>.

targeted funds were appropriated to the Public School Capital Construction Assistance Board.¹⁴ In Maryland, targeted funds were appropriated to the Interagency Commission on School Construction, an independent commission that functions within the Maryland State Department of Education and is responsible for administering many different school construction grant programs, among other duties.¹⁵

Alternatively, some states have allocated targeted funding for school ventilation and filtration to the state energy agency. Given the relationship between HVAC system design and operation and building energy efficiency, HVAC improvements may reasonably be considered energy efficiency-related projects. From that perspective, the state entity responsible for school/commercial energy efficiency initiatives may be best equipped to administer an HVAC improvement funding program. In New Jersey, for example, the legislature appropriated federal pandemic recovery funds to the Board of Public Utilities for School and Small Business Ventilation and Energy Efficiency Verification and Repair Program (SSB-VEEVR).¹⁶ In California, the CalSHAPE Ventilation program is being implemented primarily by the California Energy Commission.¹⁷ While these programs are designated as energy efficiency programs, in both cases, improving ventilation in schools – not energy savings – is the main program objective.¹⁸

In some situations, states have determined that a new or expanded school ventilation funding program can be administered most efficiently with help from contractors outside state government. At least two of the states discussed in this paper are using outside contractors to implement their programs. In New Jersey, the SSB-VEEVR Program is being administered on behalf of the Board of Public Utilities by an engineering and construction consulting company with a history of implementing energy efficiency programs in New Jersey.¹⁹ In Vermont, the legislature specifically directed the Agency of Education to “grant” \$18 million total of its Coronavirus Relief Fund appropriation to Efficiency Vermont (an efficiency utility operated by the nonprofit Vermont Energy Investment Corporation to promote energy savings) “for purposes of providing grants to Vermont K–12 covered schools to upgrade [HVAC] systems, and filtration and other methods of air treatment, in response to the COVID-19 emergency.” The authorizing law specified that Efficiency Vermont would design the program in consultation with the Agency of Education, the Vermont Superintendents Association, and HVAC experts, administer “informational guidance and best practices for school ventilation and air filtration systems,” and make grant awards to schools.

Program Duration. Legislative authorization for a grant program can be temporary (typically for a defined fiscal year or years) or indefinite. When establishing a new funding program for a specific purpose, a state legislature must decide which route to take.

¹⁴ Co. Senate Bill 21-202.

¹⁵ Maryland Interagency Commission on School Construction (IAC), About the IAC, <https://tinyurl.com/3w5x4htj>. The IAC was established to “develop and approve policies, procedures, guidelines, and regulations on State school construction allocations to local jurisdictions in an independent and merit-based manner.” Md. Educ. Code §5-302.

¹⁶ See N.J. Senate Bill 2022 at p. 260 (providing appropriations for Fiscal Year 2022).

¹⁷ The California Energy Commission (CEC) has been charged with implementing the technical aspects of the program. Funds are provided by the California Public Utilities Commission to CEC for distribution to grantees following approval from the State Comptroller’s Office. ELI Interview with Calif. Energy Comm. (May 2022).

¹⁸ While improving ventilation is the main objective of the California program, CEC is in the process of determining how energy savings from projects will be measured and reported. ELI interview with Calif. Energy Comm. (May 2022).

¹⁹ See TRC, “TRC Acquires New Jersey’s Clean Energy Program Contract and Assumes Program Administrator Role” (Jan. 2017), <https://tinyurl.com/3nsmv9a4>.

A temporary program may be attractive to policymakers who are seeking a targeted solution to a discrete problem – e.g., improving ventilation in schools during a pandemic – and/or using federal funds that must be spent within a certain time period. On the other hand, an indefinite or “permanent” program authorization may serve as a useful vehicle for subsequent appropriations, should the legislature decide to extend or revive the funding stream based on ongoing need or future circumstances. Maryland’s Healthy School Facility Fund is an example of a temporary program that has been extended by the legislature multiple times, allowing the state to address ongoing facilities needs; at the same time, the annual budget has been increased to help channel the influx of federal pandemic relief money to school districts.

Several of the state programs discussed here are short-term authorizations. In California, the law authorizing the CalSHAPE Ventilation program includes a “sunset provision”; absent further action by the legislature, the law and program will automatically terminate on January 1, 2027, which is one month after the deadline by which any unspent program funds must be returned to the utility companies who provided them. Nevada’s law (which does not provide any funding in and of itself, but rather establishes standards for using ventilation funds) is only in effect until July 1, 2023.

Pursuant to a Department of Treasury rule, all American Rescue Plan (ARP) funds must be obligated before the end of 2024 and spent by the end of 2026. 87 Fed Reg. at 4338 (Jan. 27, 2022). Accordingly, several states whose programs are funded with ARP money have adopted timing requirements to help ensure local use of the funds conforms to the federal period of availability.

In Vermont, where the Agency of Education has worked hard to ensure unambiguous compliance with federal requirements for pandemic relief funding, the state is requiring all funded projects to be completed slightly in advance of the ARP obligation deadline (by October 31, 2024), presumably allowing time for final administrative tasks before the “end of the ARP School Indoor Air Quality Grant Program” on December 31, 2024.²⁰ In Massachusetts, the agency administering the ARP-funded Improving Ventilation and Air Quality (IVAQ) grant program has decided that awardees whose initial applications (for FY23) are successful will need to re-apply for subsequent funding in each of the program’s fiscal years (FY24-27), “until the award is fully drawn down,” with all funds ultimately obligated and spent by the respective ARP deadlines.²¹

In Virginia, on the other hand, lawmakers made a one-time appropriation of \$250 million in ARP funds for distribution to localities in a single round of formula grants; the next year, the legislature “captured” (i.e., reappropriated for other purposes) \$31 million of the original funds, which had effectively gone unclaimed by the local jurisdictions to which they were available for eligible school ventilation expenses. Va. HB29 (2022). The New Jersey statute establishing the School and Small Business Ventilation and Energy Efficiency Verification and Repair program does not include a sunset provision, but the law states explicitly that the program “shall be funded by monies provided to the State from the federal government under the [ARP Act of 2021],” which effectively limits its duration to the ARP funds’ period of availability.

²⁰ Vt. Agency of Educ., American Rescue Plan (ARP) School Indoor Air Quality Grant Program, <https://tinyurl.com/ru4d72z>; ELI Interview with Vermont Agency of Education (June 10, 2022).

²¹ Mass. Dept. of Elem. and Secondary Educ., FY2023: Improving Ventilation and Air Quality in Public School Buildings Grant, <https://www.doe.mass.edu/grants/2023/209/#i>.

However, not all of the new programs reviewed here were authorized for a fixed term. The 2022 Connecticut law establishing a new school ventilation and IAQ grant program provides indefinite authorization, directing the Department of Administrative Services to administer the grants “[f]or the fiscal year ending June 30, 2023, and each fiscal year thereafter,” though the same legislation only made an appropriation to the program – made up of \$75 million in ARP funds – for Fiscal Year 2023. As is the case with many governmental grant programs, notwithstanding the duration of the authorization, ongoing implementation of the program depends on the legislature’s decision to appropriate funding each budget cycle. An exception is when program legislation provides for a mandatory appropriation in advance; this is the case in Maryland, where the 2022 amendments to the Healthy School Facility Fund statute have guaranteed mandatory appropriations to the program through fiscal year 2026.

Source of Program Funding

During the pandemic, states have allocated money for school ventilation and filtration improvements from various state and federal sources. Because different funding sources have different parameters and requirements, the source of funds may influence how grant programs are designed and implemented. [See Text Box.]

Federal Pandemic Relief Funds. Most of the state policies and programs described here were or are funded using federal pandemic response and economic relief money. In 2020 and 2021, the U.S. Congress passed multiple pandemic-related funding bills that, among other things, established several key funding sources that state and local governments must or may spend on schools. The Coronavirus Aid, Relief, and Economic Security (CARES) Act and the American Rescue Plan (ARP) Act provided funding through the Coronavirus Relief Fund (CRF), the State and Local Fiscal Recovery Fund, and the Elementary and Secondary School Emergency Relief (ESSER) Fund.²²

Federal Funding Program	Established	Timing
CRF	CARES Act (Mar. 2020)	<ul style="list-style-type: none"> Costs incurred Mar. 1, 2020 to Dec. 31, 2021
ESSER I	CARES Act (Mar. 2020)	<ul style="list-style-type: none"> State awards to LEAs by June 2021 LEAs obligate funds before Oct. 1, 2022
ESSER II	CRRSA Act (Dec. 2020)	<ul style="list-style-type: none"> State awards to LEAs by Jan. 2022 LEAs obligate funds before Oct. 1, 2023
ESSER III	ARP Act (Mar. 2021)	<ul style="list-style-type: none"> State awards to LEAs by Mar. 24, 2022 LEAs obligate funds by Sept. 30, 2024
ARP (State and Local Fiscal Recovery Funds)	ARP Act (Mar. 2021)	<ul style="list-style-type: none"> Recipients obligate funds by Dec. 31, 2024 Funds to be expended by Dec. 31, 2026

²² See 34 C.F.R. §75.616; [Coronavirus Relief Fund | U.S. Department of the Treasury; Final ESSERII Factsheet 1.5.21.pdf \(ed.gov\)](#); [FINAL ARP-ESSER-FACT-SHEET.pdf \(ed.gov\)](#); [SLFRF-Compliance-and-Reporting-Guidance.pdf \(treasury.gov\)](#); [ESSER/GEER FAQs \(ed.gov\)](#).

The Acts made funding available for a wide range of activities, including ventilation and other facility improvements. The U.S. Department of Education’s consolidated list of eligible activities for ESSER I, II, and III includes the following: “Inspection, testing, maintenance, repair, replacement, and upgrade projects to improve the indoor air quality in school facilities, including mechanical and non-mechanical heating, ventilation, and air conditioning systems, filtering, purification and other air cleaning, fans, control systems, and window and door repair and replacement.”²³

When implementing an eligible activity using ESSER funding, the LEA must follow “all applicable Federal, State, and local standards and policies (e.g., building codes or specifications for HVAC systems, which may be consistent with standards identified by the EPA, CDC, or World Health Organization).”²⁴ The U.S. Department of Education regulations require that if funds are used for HVAC systems, projects must comply with a series of ASHRAE 90 standards for energy conservation in new buildings;²⁵ one of these, ASHRAE 90 A-1980, incorporates the minimum ventilation rates from ASHRAE 62-1973 (e.g., 5 liters per second per person for classrooms, per Sec. 5.7), and includes a provision that HVAC equipment must have any routine preventive maintenance requirements clearly stated on an accessible label (Sec. 6.9).

Pursuant to Department of Education requirements, in “planning for and designing facilities,” grantees must “observe” federal OSHA standards (36 C.F.R. Part 1910) and “[s]tate and local codes, to the extent that they are more stringent.” 34 C.F.R. 75.609. State agencies distributing federal funding must also ensure compliance with the Davis-Bacon Act and related federal labor laws. ESSER and ARP funds are subject to the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (2 C.F.R. 200), and a small portion of a state’s overall allocation can be used for administrative expenses.

Vermont was one of the first states to establish a school IAQ grant program during the pandemic, using \$18 million from the state’s federal Coronavirus Relief Fund allocation to fund a first round of grants in 2020.²⁶ When a second round of \$15 million was authorized by the legislature in 2021, the funds were a targeted carveout from the state’s ARP allocation. Examples of other states whose programs were funded using a portion of the state’s ARP allocation include Virginia, New Jersey, Maryland, and Connecticut; and in Massachusetts, the legislature appropriated program funds from a state fund containing federal pandemic relief funds received after December 4, 2020 (i.e., CRRSA and ARP allocations).²⁷

²³ U.S. Dept. of Educ., Frequently Asked Questions: Elementary and Secondary School Emergency Relief Programs, Governor’s Emergency Education Relief Programs (May 2021), <https://tinyurl.com/bdz8y2pu>; see also U.S. Dept. of Treasury, 87 Fed. Reg. 4354 (Jan. 27, 2022) (“In recognition of the importance of capital expenditures in the COVID-19 public health response...the following projects are examples of eligible capital expenditures, as long as they meet the standards for capital expenditures....Other: Installation and improvements of ventilation systems....”)

²⁴ U.S. Dept. of Educ., FAQs: ESSER-GEER, *supra*, at 26.

²⁵ See 34 C.F.R. 75.616 (incorporating by reference ASHRAE-90 A-1980 (Sections 1-9); ASHRAE-90 B-1975 (Sections 10-11); and ASHRAE-90 C-1977 (Section 12)).

²⁶ Vt. Acts No. 120 (June 30, 2020) (appropriating \$6.5 million); Vt. Acts No. 154 (Oct. 2, 2020) (adding additional funds for a total of \$13.5 million); Vt. Agency of Educ., Coronavirus Relief Fund: Overview, <https://tinyurl.com/2p9cc7xz> (noting another \$4.5 million was appropriated from unused CRF funds in November 2020).

²⁷ See Va. House Bill 29 (2022), Item 479.20#3h, <https://tinyurl.com/mrx5vwux> (clarifying that ARP funds were used for the program); Mass. Session Laws, Acts (2021), Ch. 102 at 1599-2055; Mass. Gen. Laws, Part I, Title III, Ch. 29, §2JJJJ.

State and Other Funding Sources. A few states have used non-federal funding sources for their pandemic-era school ventilation programs.

In California, Assembly Bill 841 requires that the CalSHAPE Ventilation program be funded by the state's large electric and gas investor-owned utilities as part of each of their energy efficiency portfolios. Each utility must allocate their energy efficiency budgets for program years 2021, 2022, and 2023 according to a formula prescribed in the law, which is codified in the Public Utilities Code.²⁸ Pursuant to the law and the California Energy Commission's program guidelines, grant awards "must be distributed proportionally to each utility area based on program funds contributed by that utility and used for projects located in the utility's service territory."²⁹ (For example, a school receiving electricity from PG&E is eligible for a portion of the funds contributed by PG&E.) In September 2022, the legislature appropriated an additional \$20 million to the program from another source – the state's Greenhouse Gas Reduction Fund – specifically to fund replacement of HVAC systems. Ca. Assembly Bill 179 §§57, 62 (2022). Another California law, (Assembly Bill 86), appropriated \$2 billion from the state general fund for formula-based "In-Person Instructional Grants" to local education agencies. These grants may be used for "any purpose consistent with providing in-person instruction," including but not limited to ventilation and other school upgrades for health and safety. Ca. Educ. Code §§43521(c), 43522(f).³⁰

In Colorado, BEST grants – including BEST emergency grants awarded for school HVAC improvements during the pandemic – are funded annually through a portion of the state's public school lands income, the state excise tax on marijuana, and other state funding sources. In Michigan, the Department of Environment, Great Lakes, and Energy State Energy Program used a portion of the agency's leftover funds from the American Recovery and Reinvestment Act of 2009 to pay for professional HVAC assessments in K-12 schools.³¹

Reporting. Most government grant programs require some form of verification, documentation, and/or reporting with respect to grantee expenditures. In the states whose school ventilation funding programs are allocating federal pandemic relief funds, federal reporting and auditing rules apply to every award, and many states have their own general reporting requirements and/or auditing authorities for grants issued by state agencies. Some of the programs described here are subject to these generally-applicable requirements only. In a few cases, the authorizing state law and/or program procedures have established verification, documentation, and/or reporting requirements for the program specifically. None of the programs include ongoing monitoring or verification requirements, though New Jersey plans to conduct post-construction site visits, and every funded project in California is subject to potential audit.

²⁷ The qualifying utilities are Pacific Gas & Electric (PG&E), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and Southern California Gas Company (SCG). Calif. Energy Comm., California Schools Healthy Air, Plumbing, and Efficiency Ventilation Program Guidelines (2nd Ed.) at 7 (June 2022) <https://tinyurl.com/2bxcpekz> [hereinafter "CalSHAPE Program Guidelines 2nd Ed."].

²⁹ Id.

³⁰ See also M. Phillips, School Services of California, AB 86 Allowable Uses (Mar. 2021), <https://tinyurl.com/ym3jvyam>.

³¹ ELI Communication with Mich. Dept. of Env't., Great Lakes and Energy (June 2022).

Local Match Requirements

When a state legislature or agency authorizes a grant program, an important decision is whether to require grantees to share in the cost of projects, also referred to as requiring “matching” funds. Requiring a local cost share may help stretch the state’s money across more grant recipients; however, it may also create financial barriers for some schools, preventing them from pursuing eligible activities that are relatively expensive (e.g., HVAC system upgrades), or even participating in the program at all.

To help address inequitable distribution of a program’s cost share burden, states can use match percentage formulas that account for differences in applicants’ resources. In Colorado, BEST applicants generally are responsible for a local contribution or “match” based on a percentage that is calculated annually for each school district based on a formula set out in state law. While the statewide average for matching percentage is around 50 percent,³² the formula accounts for local socioeconomic factors including median household income and percentage of students eligible for free or reduced lunch, resulting in higher cost share percentages for wealthier school districts and lower percentages for underserved communities. Moreover, applicants seeking a lower cost share than the formula provides can submit a waiver application demonstrating why the factors used to calculate their match percentage are not representative of their actual finances; the board may grant a cost share waiver or reduction if the circumstances meet criteria defined in program regulations.

The Maryland HSFF program uses a similar formula to calculate the mandatory local match requirement for each county, which is “based on the State-local cost share percentage applicable to projects approved in the Capital Improvement Program fiscal year.”³³ In 2021-2022, the local share requirement ranged from as low as zero percent (e.g., Wicomico County) to as high as 50 percent (e.g., Montgomery County).³⁴

Both Colorado and Maryland relied on an existing school capital assistance program – with an existing local match requirement³⁵ – to provide targeted school HVAC funding during the pandemic. In Colorado, however, the law transferring \$10 million from the state general fund to support a special round of BEST grants for portable air cleaners in public schools did provide an exemption from the “matching moneys requirement” for that round of awards.

A few states that created a new HVAC grant program during the pandemic decided to establish a cost share requirement. In New Jersey, the SSB-VEEVR program has a 25 percent cost share requirement for all funded projects. Program staff may be available to help applicants identify other funding sources that can be used for the local cost share, including other utility incentives that may apply to a project. In Connecticut, the local share for the school HVAC system grant program will range from 20 percent to 80 percent, depending on where the applicant ranks on the list of the state’s 169 cities and towns in order of net wealth per capita. In Virginia, where all the formula grants awarded to local school divisions for ventilation improvement projects in public schools included a 100 percent local match requirement, the

³² See Colorado Dept. of Educ., Office of Capital Construction, School District Minimum Matching Calculation for BEST Grant Applicants, <https://www.cde.state.co.us/capitalconstruction/bestmatchcalculation>.

³³ Maryland IAC, Healthy School Facility Fund Administrative Procedures Guide (Apr. 2022), <https://tinyurl.com/2p9yrtbj>; see also Code. Md. Regs. §14.39.02.05.

³⁴ Maryland IAC, State and Local Cost Shares, https://iac.mdschoolconstruction.org/?page_id=4067.

³⁵ In Colorado, the board is authorized to waive or reduce cost share for recipients of emergency grants (Co. Stat. §22-43.7-109) and may have done so for some or all of the targeted HVAC grants awarded during the pandemic.

Virginia Department of Education notified school divisions that they may use a portion of their ESSER allocations for the matching funds.³⁶

In several other states, new school HVAC grant programs are not requiring a local cost share. Vermont does not require a local match for its School Indoor Air Quality grant program, and California does not require a local match for CalSHAPE Ventilation grants. Similarly, the Massachusetts legislature declined to require a local cost share in creating the Improving Ventilation and Air Quality in Public School Buildings (IVAQ) grant program. In fact, the application for the first round of IVAQ grants encourages districts to use IVAQ funds “in coordination with” money received through the state’s School Building Assistance program – which *does* require a local cost share of 20 percent or higher— to “pay for local share of itemized ventilation costs (i.e., HVAC systems) only.”³⁷ In Michigan, where the state energy program directly paid contractors to perform HVAC assessments in school buildings, school districts were not required to contribute to the cost of the assessment.

Set-Asides for Underserved Schools

Several of the state programs described in this paper were authorized with an explicit set-aside for underserved communities.

In New Jersey, the 2021 law establishing the School and Small Business Ventilation and Energy Efficiency Verification and Repair Program included a requirement that 75 percent of the projects funded by the school ventilation program must be allocated for school districts located in “underserved communities,” defined as a school district where at least 75 percent of public-school students are eligible for free or reduce-price meals. In Maryland, the law authorizing and establishing a mandatory annual appropriation for the Healthy School Facility Fund requires that between fiscal years 2021 and 2026, 50 percent of the funds appropriated under the law must be awarded to public schools in Baltimore City.

In California, AB 841 provided that at least 25 percent of projects funded by the CalSHAPE ventilation program must be located in underserved communities. The bill defines underserved communities as a community that meets one or more of the following criteria:

- is a “disadvantaged” or “low-income” community as defined elsewhere in state law (meaning a median household income less than 80 percent of the statewide average or with median household incomes at or below the threshold designated as low income by the state’s Department of Housing and Community Development);
- is within an area identified as among the most disadvantaged 25 percent of the state by California EPA, based on the most recent California Communities Environmental Health Screening Tool (CalEnviroScreen);

³⁶ Va. Dept. of Educ., Superintendent’s Memo #013-22 (Jan. 14, 2022), <https://tinyurl.com/ykp6fcam>. On the other hand, Connecticut’s 2022 law provides, “No grant funds received under this section by a local or regional board of education or a regional educational service center shall be used to supplant local matching requirements for federal or state funding otherwise received by such district for a project for the installation, replacement or upgrading of heating, ventilation and air conditioning systems or other improvements to indoor air quality in school buildings.”

³⁷ Mass. Dept. of Elem. and Secondary Educ., FY2023: Improving Ventilation and Air Quality in Public School Buildings Grant, <https://www.doe.mass.edu/grants/2023/209/#i>. The Massachusetts School Building Assistance Program requires a local cost share of at least 20 percent for school facilities projects. Ma. Gen. Laws t. 70B, §10.

- is a community in which at least 75 percent of public school students in the project area are eligible to receive free or reduced-price meals; or
- is a community located on lands belonging to a federally recognized California Indian tribe.³⁸

As of January 2023, CalSHAPE Ventilation has allocated approximately \$350 million (around 65 percent of the total available program funds) to underserved schools.³⁹ In order to ensure equitable allocation for smaller school districts, the CEC created separate tiers, based on school district size, and allocated a certain percentage of the available funds to each tier.⁴⁰

In Massachusetts, all \$100 million of the funds appropriated in 2021 for grants to public schools “to address inequitable school facilities’ needs and repairs for improved ventilation and indoor air-quality” will be awarded to districts/schools with high concentrations of economically disadvantaged students and/or English language learners and “communities disproportionately impacted” by the pandemic. The Department of Elementary and Secondary Education has set aside seven million dollars of the total available for eligible schools that are “in chronically underperforming status.”⁴¹

Project Eligibility, Prioritization, and Approval

Policies authorizing and implementing funding programs targeted for a specific purpose typically establish criteria for project eligibility and approval. Among other factors, these criteria will influence the types, number, and locations of projects that ultimately are implemented with program money.

Scope of Eligible Activities. In authorizing and developing funding programs, states have made different choices about the specific types of activities eligible for funding. Some factors that may influence a program’s scope of eligible activities include the funding source and type, policymakers’ priorities, the overall program budget, and other state-specific circumstances. Some factors that may influence an applicant’s choice about which ventilation improvements to pursue through a program include the status of current HVAC equipment, level of knowledge about baseline conditions, cost differentials among eligible project types (e.g., initial costs, operating costs), and availability of other funding sources.

For many school districts, a critical first step in improving indoor air quality is obtaining a baseline assessment of their buildings’ current ventilation and filtration levels. By enabling professional HVAC assessments, state funding programs are ensuring schools are prepared to take the next step of implementing projects to address their deficiencies, whether that opportunity arises through the existing funding program or in the future.

For programs facing limited overall budgets, deciding to provide grants only for HVAC assessments – which typically have much smaller budgets than projects to implement repairs/replacement/installation – may be part of a strategy to spread program funds among as many schools as possible. This was the approach taken by Michigan’s Environment, Great Lakes and Energy State Energy Program during the

³⁸ See Ca. A.B. 841 §1601 (incorporating definitions and criteria from Ca. Pub. Res. Code §75005 and Ca. Health & Safety Code §39713).

³⁹ ELI Communication with Calif. Energy Comm. (Jan. 2023).

⁴⁰ CalSHAPE Program Guidelines 2nd Ed, supra, at 8; ELI Communication with Calif. Energy Comm. (May 2022).

⁴¹ See Mass. Dept. of Elem. and Secondary Educ., FY2023: Improving Ventilation and Air Quality in Public School Buildings Grant, <https://www.doe.mass.edu/grants/2023/209/#i>.

pandemic: the K-12 HVAC Assistance Program spent around \$260,000 paying pre-approved contractors to conduct HVAC assessments in school buildings in 2021.⁴²

In California, the CalSHAPE Ventilation program's primary purpose is funding HVAC assessments and maintenance (including general maintenance, adjustment of ventilation rates, and installation of filters and CO₂ monitors); however, CEC automatically adds 20 percent of the amount requested for assessment and maintenance to the total award as contingency funds, which can be used for "repairs, upgrades, or replacements necessary to make the system functional or more energy efficient." For costs beyond the 20 percent contingency amount, the law leaves open the possibility of applicants requesting "additional" funds for "cost-effective energy efficiency upgrades or repairs." In September 2022, the California legislature appropriated an additional \$20 million to the program specifically for HVAC replacement projects.⁴³ In its program guidance, CEC has established maximum costs for specific eligible items and activities – e.g., \$10,000 (plus \$1,000 per system unit) for the HVAC Assessment and Maintenance; \$75 for the purchase and installation of each replacement filter – to help ensure compliance with a "reasonable costs" requirement in the authorizing legislation.⁴⁴

To help guide applicants and organize applications, CEC has adopted detailed program guidelines that establish three distinct "pathways" based on schools' general baseline conditions: (1) the HVAC assessment and maintenance pathway (for schools with existing HVAC systems that have not been replaced in the last two years); (2) the scheduled for replacement pathway (for schools that already anticipate replacing old systems, or with new systems that were installed in the preceding two years); and (3) the limited or no mechanical ventilation pathway (for schools that rely on windows and/or evaporative coolers in the absence of a building HVAC system).⁴⁵ While almost all the applications CEC received in the first round were for the HVAC assessment and maintenance pathway,⁴⁶ the other two pathways were created for schools that would not meaningfully benefit from HVAC assessment/maintenance, but would still like to take advantage of program funds for other eligible expenditures (e.g. MERV 13-level replacement filters, CO₂ monitor installation).⁴⁷ The CEC plans to issue updated guidance on applying for HVAC replacement grants in 2023.⁴⁸

New Jersey's law, which is modeled in part on California AB 841, allows school ventilation grants to be used to reimburse "reasonable costs of an HVAC assessment, assessment report, deferred general maintenance, adjustment of ventilation rates, filter replacement, system replacement, and CO₂ monitor installation."⁴⁹ As in California, New Jersey's program guidelines establish distinct pathways for applications: (1) HVAC assessment and maintenance pathway; and (2) HVAC assessment and

⁴² See Mich. Dept. of Env't., Great Lakes and Energy, Grants and Loans Dashboard—Fiscal Years 2019-2021, <https://tinyurl.com/94x6nr5j>; see also ELI Communication with Mich. Dept. of Env't., Great Lakes and Energy (June 2022).

⁴³ See Ca. Assembly Bill 179 at §§ 57, 62.

⁴⁴ Calif. Energy Comm., CalSHAPE Program Guidelines 2nd Ed., *supra*, at 30.

⁴⁵ The "limited or no mechanical ventilation" pathway can be used to cover the cost of an HVAC report that calculates and identifies in detail the building's ventilation needs. See *id.* at 22, 25.

⁴⁶ ELI Communication with Calif. Energy Comm. (May 2022).

⁴⁷ *Id.*; see also Calif. Energy Comm., CalSHAPE Program Guidelines 2d. Edition, *supra*.

⁴⁸ ELI Communication with Calif. Energy Comm. (Jan. 2022).

⁴⁹ N.J. Senate Bill 3995. New Jersey's law is modeled in part on California's AB 841, resulting in similar language in many of the two laws' provisions.

replacement/new system pathway.⁵⁰ The first pathway can be used for HVAC “maintenance, repair, and minor system repairs and upgrades,” but does not cover the installation of new HVAC units. The second pathway can be used for “the purchase and installation of a new HVAC system or unit, by way of replacement, addition, or otherwise,” if the applicant provides supporting documentation to show that the existing HVAC system (or lack thereof) is unable to meet the minimum ventilation and filtration standards required by the program (see below for discussion of technical requirements and standards).

The law authorizing Massachusetts’s new school ventilation grant program generally provides that funds may be used for “inspections, maintenance, installation, repairs or upgrades.” In implementing the program, the Department of Elementary and Secondary Education has interpreted the scope of eligible activities expansively, to encompass not only one-time assessments and upgrades but also development and implementation of longer-term IAQ planning and maintenance activities. The agency’s request for grant applications explains that eligible uses of the funds include, but are not limited to:

- needs assessments or studies of existing school environments, HVAC systems, and indoor air quality (by building and by room);
- design, bidding assistance, and construction of projects to upgrade or replace existing HVAC systems;
- feasibility studies to develop long-term IAQ improvement plans that improve fresh air exchange rates (and reduce or eliminate reliance on fossil fuels);
- to implement IAQ improvement plans, securing outsourced services, establishing in-house HVAC maintenance positions, and/or securing materials and equipment to maintain, repair, or install new HVAC systems;
- professional development for facilities directors to service and maintain HVAC systems to ensure sustained, healthy IAQ conditions; and
- “other services and materials aligned with the priorities of this grant.”⁵¹

Most other funding programs described in this paper are not prescriptive when identifying eligible (or required) activities. In Colorado, for example, the BEST emergency grants were available for “capital projects to resolve ventilation and filtration issues in occupied school facilities,” with the agency “recommending” actions including assessment, maintenance, adjustment, “and, if necessary, repair or replacement of existing HVAC systems to ensure ventilation rates meet or exceed the standards set forth in ASHRAE 62.1-2019 Ventilation for Acceptable Indoor Air Quality, and/or 2015 International Mechanical Code.”⁵² In Vermont, Efficiency Vermont technical staff apply their best professional judgment to each school’s initial application to help determine the appropriate scope of the project before the applicant submits a detailed final request for funding.⁵³

⁵⁰ See N.J. Bd. of Public Utilities, School and Small Business Ventilation and Energy Efficiency Verification and Repair Program Guide V1.2 (Dec. 2021), <https://tinyurl.com/5659ev3e>.

⁵¹ Mass. Dept. of Elem. and Secondary Educ., FY2023: Improving Ventilation and Air Quality in Public School Buildings Grant, <https://www.doe.mass.edu/grants/2023/209/#i>.

⁵² Colorado Dept. of Educ., Capital Construction Assistance Board—Emergency Grants in Response to COVID-19, <https://tinyurl.com/yckz759r>.

⁵³ ELI Communication with Efficiency Vermont (July 2022) and Vt. Agency of Educ. (June 2022).

Funding for Portable Air Cleaners

Some states, along with many school districts, set up funding programs during the COVID-19 pandemic specifically for schools to obtain portable air cleaners – stand-alone air filtration devices that have been used widely in schools during the pandemic to supplement other ventilation and filtration measures.

For example, in Colorado, the legislature appropriated \$10 million from the state’s general fund in 2021 to the school capital construction assistance fund specifically for the purchase, repair, maintenance, or upgrading of “portable HEPA fan or filtration systems” in public schools. According to state officials, 66 districts (including charter schools) were awarded 90 grants for a total investment of over \$7.2 million. The state’s 2021 HVAC emergency grants program (carried out under the BEST funding program) did not exclude portable air cleaners, but expressly disallowed “supplemental disinfecting systems, such as hydrogen peroxide or bi-polar ionization.”

In Vermont, Efficiency Vermont is not approving purchases of portable air cleaners during the second round of the school ventilation improvement program; however, the Vermont Agency of Education has collaborated with the state health department to use a portion of the state’s 2021 grant from CDC for reopening schools to purchase portable air purifiers for schools (including non-public schools, which are frequently ineligible for direct federal pandemic funding programs). Since December 2021, AOE has distributed over 2,000 purifiers and over 10,000 replacement filters to schools.

In Massachusetts, the Commissioner of Elementary and Secondary Education used state reserve ESSER funds to purchase over 12,300 portable air purifiers and have them delivered directly to schools that requested them in late 2020 and early 2021.

Additional sources: ELI communication with Colorado Dept. of Health, Mass. Dept. of Elementary and Secondary Education, Vt. Agency on Education, and Efficiency Vermont (Spring 2022)

Prioritizing Eligible Applications. The way a funding program prioritizes among the eligible applications it receives can have a significant impact on where and how available money is distributed.

Some programs evaluate applications on a rolling basis. In California and New Jersey, for example, the programs review and approve applications in the order they are submitted in complete form (i.e., including all required documentation); in both states, program staff will work with applicants to amend applications if they are incomplete upon first submission.⁵⁴ The first-come, first-served approach may disadvantage applicants with less capacity for developing the application, or who did not learn about the program opportunity in time to apply early in the application period, but programs can use strategies

⁵⁴ ELI Communication with TRC (May 2022); ELI Communication with Calif. Energy Comm. (May 2022).

like equity-focused set-asides (discussed above), technical assistance for developing applications, and caps on individual award amounts to help counter some of the potential issues.

Other programs administer “competitive” grants, where scoring or prioritization criteria are used to decide which applicants receive funding. In Maryland, for example, the administrative procedures guide for the Healthy Schools Facilities Fund explains that funding priority is based “first on the severity of an immediate life, safety, or health environmental risk, and second on the following defined categories of work,” in order: lead in water; roofs; air conditioning; heat; temperature; plumbing; indoor air quality, including remediation of indoor pollutants; and windows. These priority factors are the same ones identified by the legislature in the program’s authorizing statute; however, in developing its implementing rules, the agency has assigned them an order where the statute does not. Agency procedures are also used to assign an additional priority consideration based on school type (in order: special education, elementary, middle school, and high school).⁵⁵

Another approach is to divide the total program budget into “formula grants” based on one or more objective criteria (e.g., population). In Virginia, the legislature appropriated \$250 million of the state’s federal ARP money for direct formula grants to local school divisions (counties) for “qualifying ventilation improvement projects” in public schools. According to a formula based on number of enrolled students, each county was assigned a maximum possible award amount; the school divisions then submitted applications requesting money for projects up to that amount.⁵⁶

In Connecticut, the legislation establishing a new grant program to support school IAQ states: “If there are not sufficient funds to provide grants to all local and regional boards of education and regional educational service centers, based on the [towns’ respective cost share] percentage determined pursuant to [the law], the commissioner shall give priority to applicants on behalf of schools with the greatest need for heating, ventilation and air conditioning systems or other improvements to indoor air quality in school buildings...”

Prioritizing Equity. State legislatures and agency policymakers can use prioritization procedures to help ensure or enhance equitable access to financial assistance, whether grants are issued on a rolling basis or competitively.

For example, in California, AB 841 requires that the program offer funds to schools that are in an underserved community before schools that are not in an underserved community; accordingly, CEC’s program procedures limited first-round applications to schools in underserved communities, resulting in the allocation of \$150 million out of \$650 million total available (23 percent) to underserved schools before other schools applied.⁵⁷ As noted previously, CEC also divided the total funding into three tiers based on school district size, helping to ensure large school districts with higher-budget projects do not consume a disproportionate share of the program budget to small school districts’ disadvantage.⁵⁸

⁵⁵ Maryland IAC, Healthy School Facility Fund Administrative Procedures Guide at 3-4, <https://tinyurl.com/2p96masw>.

⁵⁶ The law (Va. House Bill 7001) provided that notwithstanding the formula, the minimum award was \$200,000. See also Va. Legis. Info. System, 2022 Session: Budget Amendments - HB29 (Floor Approved), <https://tinyurl.com/mrx5vwux> (noting \$31 million was left unspent by counties).

⁵⁷ See Calif. Energy Comm., Notice of Funding Availability for Funding Round One of the CalSHAPE Ventilation Program, <https://tinyurl.com/25ap6vn3>; see also ELI Communication with Calif. Energy Comm. (May 2022).

⁵⁸ Calif. Energy Comm., CalSHAPE Program Guidelines 2nd Ed., *supra*, at 8; ELI Communication with Calif. Energy Comm. (May 2022).

A slightly different approach is used in Maryland: 50 percent of the Healthy School Facility Fund appropriations are reserved for public schools in Baltimore City, where the local cost share amount was calculated at just four percent for Fiscal Year 21-22 (compared with a statewide average of 34 percent) based in part on equity-related factors.⁵⁹ Pursuant to a provision added to the authorizing statute in 2021, the board uses a separate application process for Baltimore City.⁶⁰ According to the HSFF administrative procedures guide, funding requests for Baltimore City are “considered and approved based on the same programmatic requirements as other LEAs’ requests, but will not be prioritized with other LEAs’ requests.” Rather, Baltimore City requests and projects are “delivered in accordance with a schedule published annually by the Maryland IAC on its website.”⁶¹ In New Jersey, the program accepted applications from underserved and “other schools” at the same time, but program staff are reviewing the two sets of applications in different pipelines.⁶²

Even absent formal prioritization policies or procedures, programs can identify opportunities to consider equity in their approval decisions. For example, in Vermont, where Efficiency Vermont is implementing a second round of their school ventilation grant program using a legislative carveout from the state’s ARP funds, the program is prioritizing applicants based on the percentage of adequate mechanical ventilation currently being provided in the school; however, in cases where applicants’ ventilation needs are equal, schools with fewer economic resources generally receive priority.⁶³

States may find other, complementary opportunities to advance equity beyond the funding approval process. In Connecticut, for example, the same 2022 legislation that establishes the school HVAC grant program also authorizes a pilot program to facilitate equitable workforce training in the HVAC trade. The pilot program will be used to develop “preapprenticeship workforce pipeline training programs... designed to identify and support the training of individuals from underserved and underrepresented populations and historically marginalized communities in the installation and maintenance of [HVAC] systems” and related trades. The law specifies mandatory program elements: “comprehensive career navigational and wraparound training services including, but not limited to, recruitment, job coaching, supportive services inclusive of transportation services and job placement support.” The state’s Office of Workforce Strategy must establish the program by March 2023 (subject to appropriations) in consultation with the Labor Department’s Office of Higher Education and Technical Education and Career System.

Technical Specifications and Requirements

There has been an abundance of best practice guidance documents on school ventilation published by federal, state, and non-governmental experts. In authorizing and implementing school ventilation grant programs, states must decide how to incorporate these practices into their program requirements and/or recommendations. Mandating minimum technical standards for projects can help ensure that projects achieve significant improvements in ventilation and filtration; on the other hand, prescribing

⁵⁹ The local cost share requirement is based on a formula that considers equity-related factors, including the jurisdiction’s unemployment rate, community wealth, and ability to pay. See Code. Md. Regs. §14.39.02.05. The local cost share may be as high as 50% for high-wealth communities and as low as 0% for communities in need of more state assistance. See Maryland IAC, State and Local Cost Shares, https://iac.mdschoolconstruction.org/?page_id=4067.

⁶⁰ See 2021 Md. Laws Ch. 698 (S.B. 551); Md. IAC, Healthy School Facility Fund Administrative Procedures Guide at 5, <https://tinyurl.com/md9uprsd>.

⁶¹ Id.

⁶² ELI Communication with TRC (May 2022).

⁶³ ELI Communication with Efficiency Vermont (July 2022).

strict technical requirements may deter schools with less technical experience and fewer resources to supplement the HVAC grant.

Mandatory Technical Standards and Procedures. A minority of the state programs described in this paper have established or incorporated mandatory technical standards as program requirements.

In Colorado, applications for the BEST program's (competitive) grants are evaluated for consistency with the state's Public School Facility Construction Guidelines, which incorporate model codes and standards including ASHRAE Standard 62.1-2013, among other scoring criteria.⁶⁴ Colorado law also requires that state-funded new construction or substantial renovation projects must comply with the state's high performance standard certification program (HPCP). Co. Stat. §24-30-1305.5. For K-12 schools, HPCP compliance means following one of the following high performance guidelines: the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) (targeting the Gold level), the Collaborative for High Performance Schools (CHPS) guideline (targeting the Verified Leader level), or the Green Building Initiative's Green Globes (targeting the Three Globes level). 1 Co. Admin. Code §303-1:4.⁶⁵

The two programs with the most detailed technical requirements are funded through energy-related agencies. In California, the authorizing legislation for the CalSHAPE Ventilation program establishes detailed "conditions for receiving the grant" that apply explicitly to "all air-handling units, rooftop units and unitary and single zone equipment in [a recipient] facility's HVAC system or systems." New Jersey's School and Small Business Ventilation and Energy Efficiency Verification and Repair Program requires, as a condition for receiving a grant, that schools "must comply with the requirements of the bill for all certain aspects of the schools'...HVAC system or systems." It is unclear whether and how requirements of an ongoing nature will be enforced.⁶⁶

Filtration. Since New Jersey's funding legislation was modeled in part on California's AB 841, the two laws contain many identical or similar technical requirements. Both states' laws prescribe that the first step of any funded project is filtration: schools must install filtration with a minimum efficiency reporting value (MERV) of 13 or better in the HVAC system "where feasible"; qualified testing personnel must "review system capacity and airflow to determine the highest MERV filtration that can be installed without adversely impacting equipment...replace or upgrade filters where needed, and...verify that those filters are installed correctly." Recommendations for additional maintenance, replacement, or upgrades to allow for more protective filtration must be recorded in the required assessment report.

Ventilation Rates. Both laws also provide that after completing filtration-related requirements, the next step is to verify ventilation rates in occupied areas of the school facility and assess whether the rates meet certain minimum requirements. In California, the ventilation rates must meet requirements set forth in the state's energy code for new construction. In New Jersey, HVAC systems must be assessed for their ability to meet minimum ventilation standards in ASHRAE Standard 62.1-2019,

⁶⁴ See 1 Co. Admin. Code §§303-3:6, 303-1:3.

⁶⁵ See also Colorado Dept. of Educ., High Performance Certification Program, <https://tinyurl.com/2p8ekcbu>.

⁶⁶ Some of the policies reviewed in this report specifically exclude future maintenance costs from project budgets. For example, in California, program guidance specifies that the cost of future adjustments by qualified personnel may not be included in the project budget. See Calif. Energy Comm., CalSHAPE Program Guidelines 2nd Ed., *supra*, at 20.

which are more stringent than the ventilation rate requirements in the state’s generally applicable building code.⁶⁷

Both programs require that if the system does not meet the prescribed minimum ventilation rate, the qualified technician must “review the system airflow and capacity to determine if additional ventilation can be provided without adversely impacting equipment performance and building indoor environmental quality” – and either adjust the ventilation rate accordingly or describe the deficiency in the required assessment and verification reports.⁶⁸ Each of the two laws also enumerates the specific system components and functions that must be inspected and identified for potential repair/replacement during the assessment. In New Jersey, where one of the application pathways is focused on system replacement, the law provides that all “HVAC systems installed pursuant to the bill” must meet ANSI/ASHRAE Standard 62.1-2019.

HVAC Operating Practices. Reflecting the overarching purpose of enabling safe reopening during the pandemic, both states’ laws include requirements relevant to pandemic-mode operations – i.e., verifying that operational times, setpoints, daily flush times, and certain other features meet ASHRAE Guidance for Reopening and Operating Schools and Buildings or otherwise applicable local or state guidance. The laws also authorize the implementing agency to amend requirements for filtration levels, ventilation rates, and ventilation schedules based on the latest COVID-19 or other applicable guidance.

CO₂ Monitoring. Both of these programs also require installation of carbon dioxide monitors in all schools receiving program funding “to ensure proper ventilation is maintained throughout the school year.”⁶⁹ The monitors must be installed in all classrooms to meet various technical specifications set out in the legislation, including providing some type of alert or notification when CO₂ levels in the classroom exceed 1,100 PPM.⁷⁰ Moreover, both the California and New Jersey laws provide that if “a classroom carbon dioxide concentration exceeds 1,100 PPM more than once a week as observed by the teacher or other building staff, the classroom ventilation rates shall be adjusted by qualified personnel to ensure peak carbon dioxide concentrations in the classroom remain below the maximum allowable carbon dioxide PPM setpoint.”

Michigan’s policy also includes technical requirements for HVAC funded projects. According to program staff, the State Energy Program worked closely with ASHRAE’s regional office to develop the COVID-19 School Building HVAC Checklist, which was used for all HVAC assessments paid for by the program.⁷¹ The checklist was based on the agency’s “indoor air quality checklist” and ASHRAE recommendations including ASHRAE 62.1 and “ASHRAE COVID-19 Guidelines,” and was intended to “provide a record of the current status towards having the listed items in place and functioning correctly to school officials along with estimated cost for any items on the checklist that do not meet the ASHRAE recommendations.”⁷²

⁶⁷ ELI Communication with TRC (May 2022); see also N.J. Admin. Code §5:23-3.1 (requiring compliance with ASHRAE 90.1 for new construction).

⁶⁸ Ca. Assembly Bill 841 §1623.

⁶⁹ Id. at §1625.

⁷⁰ Id.

⁷¹ ELI Interview with Mich. Dept. of Env’t., Great Lakes and Energy (June 2022); see also Mich. Dept. of Env’t., Great Lakes and Energy, COVID-19 School Building HVAC Checklist (Oct. 2020), <https://tinyurl.com/458kx37>.

⁷² Id.

In Nevada, once the 2021 law is triggered, the school board is required to “ensure that each school in the school district...is equipped with functional ventilation systems that are tested, adjusted and, if necessary or cost-effective, repaired, upgraded or replaced to increase efficiency and performance.” Qualified personnel must be employed to assess the status of, and make any necessary improvements to, the filtration system, ventilation rates, HVAC system, and carbon dioxide monitors at the school following specific procedures outlined in the statute. (If a public school has a limited or no ventilation system, qualified personnel are required to document existing conditions and “provide a licensed professional engineer with any information necessary for the licensed professional engineer to make recommendations for upgrading or installing a ventilation system.”)

Nevada’s law defines minimum ventilation rates (“the rates set forth in the Uniform Mechanical Code”) and filtration levels (“the best minimum efficiency reporting value based on industry standards that can be installed without adversely affecting the filtration system”) for covered projects, and mandates that if deficiencies are identified, the school board must “perform any work required to meet the minimum requirements for ventilation and filtration” up to an estimated cost of \$200,000 (though additional recommended work may be performed at the school board’s discretion).

Assisting Applicants with Technical Compliance: California Resources

To help applicants achieve compliance with the program’s technical requirements, the California Energy Commission has issued various guidance documents, forms, and templates related to different aspects of the CalSHAPE Ventilation program.

- The [Ventilation Program Commission Guidelines](#) provide a comprehensive overview of the “requirements for program participation including eligible applicants and projects, the application process, funding awards and distribution, as well as project documentation and reporting requirements.”
- Notices of funding availability (e.g., for [round three](#)) have emphasized application requirements found in the guidelines and enumerated the supporting documentation that must be uploaded, and a video tutorial about the application process is available on the program [website](#).
- There are [worksheets, spreadsheets, and other forms](#) for each of the three application pathways to help program participants gather information needed for reporting purposes. The CEC has also published a [FAQ document](#) to provide more information about eligible uses of the “contingency funds” that are automatically added to each award.

Qualified Service Providers. By requiring that all HVAC services be performed by qualified providers, programs can help ensure that activities are implemented in accordance with industry standards to protect health and safety. In addition to any general state requirements governing licensing of contractors, several of the programs described here explicitly require that activities funded through the program be performed by qualified individuals, whether they are outside contractors or school facilities personnel who meet necessary qualifications.⁷³

In the states reviewed here with detailed technical requirements included in their policies (i.e., California, New Jersey, Nevada), specific professional qualification requirements are assigned to each eligible activity type. In general, these policies require “qualified testing personnel” for activities such as: determining maximum possible filtration levels and installing new filters; verifying ventilation rates and assessing whether they meet ventilation standards; and verifying the condition and performance of HVAC system elements and functions. A similar but distinct category of technician, “qualified adjusting personnel,” typically must be used for determining whether current systems can be adjusted to provide more ventilation and, if so, for making such adjustments.

In California and Nevada, a “certified TAB technician” – defined by law as a technician who has been certified to perform testing, adjusting, and balancing (TAB) of HVAC systems by either the Associated Air Balance Council, the National Environmental Balancing Bureau, or the Testing, Adjusting and Balancing Bureau – is considered qualified for both testing and adjusting activities. California and Nevada also accept certifications from alternate third-party groups (CEC-approved and ANSI-accredited, respectively) for qualified testing personnel; both states also define qualified adjusting personnel to also include a “skilled and trained workforce” working under the supervision of a certified TAB technician. In New Jersey, where “certified TAB technician” is not further defined in the law (e.g., to specify which third-party certifications are acceptable), both testing and adjusting activities can be performed by a skilled and trained workforce under supervision of a certified TAB technician.

When it comes to reviewing the HVAC assessment report to determine and recommend measures to correct deficiencies, all three programs require another level of qualification. In California, these activities must be performed by a professional licensed pursuant to the state’s Business and Professions Code to perform system design, construction, or installation of features, materials, components, or manufactured devices for mechanical systems. New Jersey’s law requires a “certified energy auditor,” defined as a commercial entity determined to be qualified by the Board of Public Utilities to conduct and develop an energy audit meeting the standards of ASHRAE Level II and III...” In Nevada, these activities must be performed by a “licensed professional engineer” (not further defined in the law). In general, a less stringent qualification is required for performing maintenance, repair, and construction: a “skilled and trained workforce,” defined as a workforce where at least 60 percent of the construction workers are graduates of a qualifying apprenticeship program for the applicable occupation.

In the other states reviewed in this report, service provider qualifications may be required in practice by the program, even if specific qualifications are not defined in the authorizing policy or program procedures.

⁷³ Another state, Delaware, passed a law in June 2022 requiring the state’s Division of Public Health to establish a contractor certification program for public school indoor air quality services. Once the program is in place, local and regional school boards will only be allowed to enter contracts for indoor air quality remediation with contractors who have been certified through the program. De. Senate Bill 270 (signed into law Oct. 11, 2022).

Conclusion

The widespread attention to and improvement of ventilation and IAQ in schools that has occurred since 2020 can be maintained and built upon through the adoption of state policies that increase the ventilation and filtration requirements that apply to school buildings, but that is only one part of a successful strategy. Funding for school ventilation assessments, upgrades, and maintenance will be a key factor in schools' ability to meet new regulatory obligations and sustain improvements into the future.

Many of the state funding programs discussed here have relied on the temporary infusion of federal pandemic relief money as the source of their funds, and the historic levels of federal assistance have enabled many schools to address ventilation and filtration. However, longer-term solutions to improve and maintain school ventilation will require ongoing sources of funding. The policies and programs described above have laid vital groundwork for dedication of state funds from other sources in the future. The variations in their approaches to program design and implementation help shed light on important considerations for state lawmakers and agencies considering similar programs:

- Establishing a new program provides opportunities to tailor program features to best achieve ventilation improvement goals. On the other hand, standing up an entire new grant program can be resource intensive, and the alternative approach of administering funds through an existing grant program may allow for a more efficient rollout.
- Requiring school districts to share in the cost of funded projects may help stretch the state's money across more grant recipients; however, it may also create financial barriers for some schools. For programs with cost share requirements, states can use match percentage formulas that account for differences in applicants' resources to help prevent exacerbation of inequities.
- In authorizing and developing programs, states have made different choices about the specific types of activities eligible for funding. At a minimum, enabling schools to take the critical first step of obtaining a baseline HVAC assessment lays the groundwork for subsequent projects to address deficiencies, whether that opportunity arises through the same funding program or in the future. For programs with a broader range of eligible activities, creating separate application "pathways" for different project types can be a helpful strategy for agencies and applicants.
- The way a funding program prioritizes among eligible applications can have a significant impact on where and how the available money is distributed. Whether programs are designed to issue grants on a rolling basis or competitively based on scoring criteria, incorporating features such as equity-focused set-asides and/or prioritization schemes, technical assistance for developing applications, and caps on individual award amounts can help counter some of the potential issues.
- States must decide how to incorporate ventilation best practices into their program requirements and recommendations. By mandating minimum technical standards for projects, states can help ensure money is well spent on projects that achieve significant IAQ improvements. On the other hand, strict technical requirements may deter schools with less in-house expertise and fewer resources to supplement the grant. At a minimum, requiring that all HVAC services be performed by qualified providers can help ensure that activities are undertaken in accordance with industry standards to protect health and safety.