

Improving School Infrastructure Benefits Students, the Economy, and the Environment

Many U.S. public school buildings are in dire [need](#) of renovations, as the average age of U.S. school buildings is approximately 49 years, and an estimated 53% have never undergone any major [renovations](#). By renovating, upgrading, and improving the resilience of school buildings, schools can maintain a safe and modern learning environment for students and faculty and be better prepared for extreme weather events exacerbated by climate change like wildfires and [heat](#). Improving school infrastructure also saves money; one [study](#) shows that each dollar spent on renovating structures to use modern building codes can save \$11, by averting post-disaster costs.

To aid schools and districts in making these improvements, the Biden-Harris administration and Congressional Democrats have made several new sources of federal funding available through the American Rescue Plan (ARP), Bipartisan Infrastructure Law (BIL), and Inflation Reduction Act (IRA).

Investments in school infrastructure improve students' health and academic outcomes

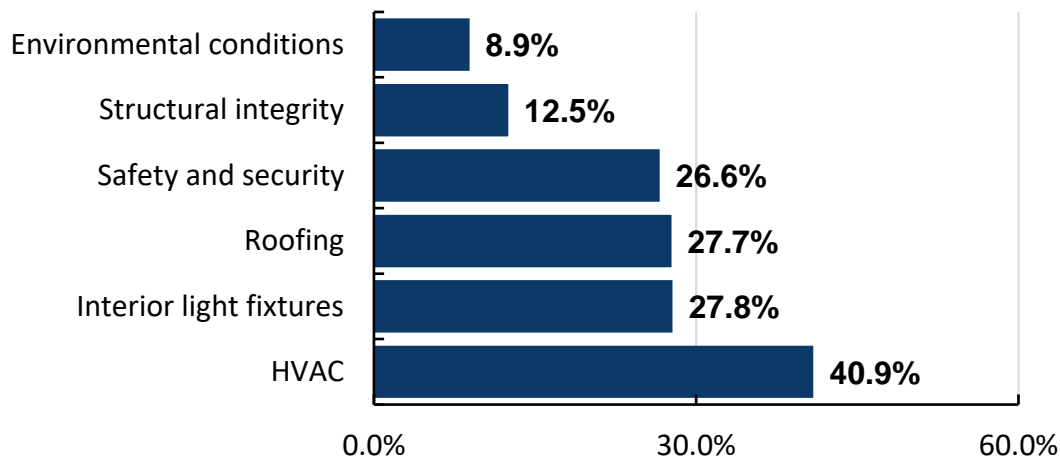
Schools can make several upgrades and repairs that will [benefit](#) students' physical health and academic success. Modern school [ventilation](#) that improves air quality and [retrofitted](#) electric school buses, for example, are proven to have benefits for students' school [attendance](#), test scores, and health. Natural light, functioning school heating and cooling systems, and quality classroom acoustics can help [improve](#) students' ability to focus and better absorb information. Taking an exam on a 90-degree day, for instance, results in a 12.3% higher chance of [failing](#) than if taken on a 72-degree day, according to a study of high school students—an effect which would likely be significantly reduced by proper air conditioning. Schools must be equipped to keep students cool on hot days, as well as warm on cold days.

However, a 2020 [report](#) from the Government Accountability Office found that 41% of districts need to update or replace heating, ventilation, and air conditioning (HVAC) systems in at least half of their schools, which amounts to around 36,000 schools nationwide.

Poor school infrastructure—and its consequences—are not experienced evenly across all groups. These [challenges](#) are most [prevalent](#) in underfunded schools and those serving Native and Black students, and those in Puerto Rico. A 2016 U.S. Inspector General [report](#) found that over half of Bureau of Indian Education-funded schools were in poor or fair condition, and there was a [backlog](#) of basic maintenance that [totaled](#) \$639 million as of 2019. Additionally, as of 2020, 95% of public schools in Puerto Rico were not built to earthquake building [codes](#).

HVAC Updates Are a Priority for School Districts

Estimated percentage of districts where at least half the schools need updates, selected options, 2020



Source: U.S. Government Accountability Office



Investing in resilient school infrastructure saves schools money and can safeguard them against extreme weather events

Currently, K-12 public schools spend approximately \$8 billion in energy [costs](#) every year. Their energy consumption has been estimated to produce the same level of [emissions](#) as 18 coal-fired power plants. By transitioning schools to clean energy sources, the United States could dramatically reduce emissions and save school districts money on their energy bills. One example of this in practice is an [Arkansas](#) school district that is projected to save \$2.4 million as a result of installing solar power and making energy efficiency upgrades—allowing for an increase in teachers' wages.

Investing in resilience and adding clean energy infrastructure to schools can mitigate [harms](#) done to students by climate-exacerbated events. In many regions of the country, wildfires, droughts, flooding, and rising temperatures pose risks to school infrastructure and students' health and may even force schools to [close altogether](#). Added resilience to schools can also [benefit](#) the surrounding community during extreme weather events, as it can allow for schools to serve as emergency shelters—providing electricity and housing to residents in times of need. In Florida, for instance, residents without power during hurricanes are able to shelter at schools equipped with solar [power](#) and energy storage systems.

Many schools lack the climate-resilient infrastructure needed to protect students from school disruptions. In [California](#), for example, around 40% of schools are more than 50 years old and likely not equipped for the high heat and extreme weather events that the state is increasingly facing. These schools may place students at a greater risk of exposure to heat and wildfire

smoke, harming their [health](#), increasing their medical costs, and interfering with their ability to [learn](#). One [study](#) finds that [wildfires](#) alone may result in a reduction in future earnings among U.S. students as high as \$2.1 billion each year.

Electrifying school buses, the largest mass transit fleet in the country, can improve student health, reduce pollution, and increase school savings

During the 2019-20 school [year](#), public K-12 schools in the United States spent nearly \$26.3 million on student transportation, using nearly 480,000 school [buses](#). Given this extensive use, electrifying school [buses](#) presents a significant opportunity to reduce greenhouse gas emissions, protect children's health, and further lower operational costs for our nation's schools.

Using [electricity](#) instead of diesel fuel to power school buses would eliminate tailpipe pollution and reduce greenhouse gas emissions, which are harmful to the environment and public health. The transition to electric school buses can be achieved in large part through [retrofitting](#), which involves replacing the internal combustion engine in a bus with an electric motor and battery system. This costs up to \$300,000 [less](#) than the cost of fully replacing an existing school bus with a newly-purchased electric bus.

Other research show that these retrofits pay off long-term by improving students health and academic performance. A [study](#) found that retrofitting just 10% of a Georgia school district's bus fleet improved students' respiratory health and test scores, with the improved scores translating into nearly \$2.6 million in higher lifetime earnings for the district's 9,000 students. This suggests that a wider rollout could have significant benefits for students' academic outcomes and future earnings. Electrifying school buses also provides further long-term benefits through [savings](#) in maintenance and operating costs, despite higher upfront costs, with each bus saving an average of \$170,000 in maintenance and operation costs over its lifetime.

Electric school buses could also play a role in strengthening the U.S. electric [grid](#), by providing energy back to the grid using vehicle-to-grid [technology](#) (V2G)—when electric school bus batteries put their power back into the grid outside of school hours. In the Stockton Union School District in California, for example, electric school buses are used to [support](#) the grid during events such as wildfires, providing backup power to help with power outages.

Federal investments are improving school buildings and classrooms

Over the past four years, the Biden-Harris [administration](#) and Congressional Democrats passed monumental legislation—the ARP, BIL, and IRA—that secured funds to improve school buildings, which states are already using to improve [facilities](#). States and districts, for example, have used their ARP Elementary and Secondary School Emergency Relief [funds](#) to upgrade HVAC systems, make repairs that prevent illnesses like lead abatement, remove mold and mildew, and replace leaky roofs. Other funding [streams](#) within the U.S. Department of the Treasury have allowed states like New Jersey to [create](#) a \$180 million fund for schools and businesses to upgrade HVAC and water systems.

Within the U.S. Environmental Protection Agency's (EPA), the BIL provided funding for a new Clean School Bus [Program](#) that allocates \$5 billion over five years to [replace](#) existing diesel school buses with zero-emission and low-emission models. In [January](#) 2024, EPA selected 67 applicants to receive nearly \$1 billion to purchase over 2,700 clean school buses across 37 states. These important funds are already helping Albuquerque Public Schools [replace](#) older, diesel school buses with 20 new electric school buses.

The BIL also authorized the creation of a new \$500 million EPA [program](#) called Renew America's Schools. This program will award \$190 million over three phases to districts working to implement energy upgrades at K-12 schools to help lower energy use and costs, improve indoor air quality, and foster healthier learning environments. Additionally, through the IRA, the EPA is able to [award](#) \$32 million to organizations to help K-12 schools in low-income, disadvantaged, and Tribal communities address indoor air pollution.

In January 2024, the administration also announced \$47 million in new [funding](#) through the U.S. Department of Education to further support school infrastructure improvements. In Congress, Democratic Senators recently called for \$5 million to be appropriated to study cost-effective pathways for public school electrification. Democrats have also introduced the [Impact Aid Infrastructure Partnership Act](#) and the [Rebuild America's Schools Act](#) to provide additional funding for school improvements.

Modern, safe, and resilient school infrastructure will better support students, the economy, and the environment

When schools and districts take advantage of federal funding opportunities, they're supporting their students and the environment while saving money that can be used for other purposes like raising teacher wages. They are also ensuring that school infrastructure will be in a better position to face the growing threat of climate change and keep students safe.