REPORT TO THE LEGISLATURE

DEPARTMENT OF ECOLOGY
State of Washington

Zero-Emission School Bus Grant Program: Recommendations and Implementation Considerations

Introduction

Legislative directive

In 2024, the Legislature adopted Engrossed Second Substitute House Bill 1368[1] (E2SHB 1368), codifying RCW 70A.15.4200[2] which directs Ecology to

> (6) By June 1, 2025, the department in consultation with the superintendent of public instruction must submit a report to the governor and the relevant policy and fiscal committees of the legislature providing an update on the status of implementation of the grant program under this section and a summary of recommendations and implementation considerations for transitioning the zero emission school bus grant program to the competitive school bus vehicle depreciation schedule established in RCW 28A.160.200[3].

Additionally, RCW 70A.15.4200 specifies that Ecology must administer a Zero-Emission School Bus[4] Grant Program to transition from fossil-fuel school buses to zero-emission school buses and charging infrastructure, prioritizing grants to school districts serving communities overburdened with air pollution and with school buses manufactured prior to 2007. Ecology may only issue grants under the Zero-Emission School Bus Grant Program until the school bus depreciation schedule[5] established in RCW 28A.160.200 is adjusted to fund the cost of zero-emission bus purchases, at which time Ecology must transition the grant program to focus solely on electric vehicle charging infrastructure grants.

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[1] https://lawfilesext.leg.wa.gov/biennium/2023-24/Pdf/Bills/Session%20Laws/House/1368-S2.SL.pdf
[2] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.15.4200
[3] https://app.leg.wa.gov/rcw/default.aspx?cite=28A.160.200
[4] *Zero-emission vehicle (school bus)* means a vehicle that produces zero exhaust emission of any air pollutant and any greenhouse gas other than water vapor. In Washington state, the only zero-emission school buses that currently meet state specifications are battery electric school buses.

[5] *School bus depreciation schedule* refers to the schedule of annual payments calculated by the Office of Superintendent of Public Instruction to fund the replacement of school buses once they reach the end of their lifetime as established in WAC 392-142 (8 or 13 years).

Ecology developed this report in consultation with the Office of Superintendent of Public Instruction (OSPI).

Washington state's transition to zero-emission school buses

The Transportation Electrification Strategy (TES),[6] was published by the Electric Vehicle Coordinating Council in 2024 and defined a roadmap for the state to electrify and decarbonize all transportation in line with state climate goals, with a particular focus for on-road vehicles. To meet state climate goals in RCW 70A.45.020[7], the TES identifies the need to "accelerate and fund school bus electrification to meet needed adoption rates." The TES recommends Ecology, in collaboration with OSPI, "develop [a] funding process that does not require school districts to apply for state competitive grants separate from other direct funding streams, and that ensures a seamless transition from Ecology's Clean Diesel school bus program."

RCW 28A.160.260[8] requires that school districts transition to zero-emission buses when the total cost of ownership[9] (TCO) of zero-emission and diesel buses are equal. OSPI is also required by RCW 28A.160.260 to adopt rules to establish formulas that address the TCO for zero-emission buses, in consultation with Ecology. Examples of formula factors that contribute to the TCO are new bus costs, annual fuel and maintenance costs. This report builds on the preliminary TCO formula factors[10] identified by OSPI and included in the zero-emission school bus survey,[11] conducted in November 2024.

Transitioning from a primarily diesel school bus fleet to one that is zero-emission requires modifying existing programs and structures to accommodate the new technology. School bus fleet electrification is not happening in isolation. Public and private fleets in Washington are moving from early-adoption of zero-emission vehicles to rapid adoption as zero-emission vehicle models increase in availability and capability. Electric vehicles offer organizations an opportunity to reduce operating costs and lower emissions, which improves air quality and health outcomes. It will take a concerted and coordinated transportation planning effort including state agencies, utilities, local governments, and private fleets to enable wide-scale adoption.

[6] https://www.commerce.wa.gov/clean-transportation/tes/
[7] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.45.020
[8] https://app.leg.wa.gov/RCW/default.aspx?cite=28A.160.260
[9] *Total cost of ownership* is the sum of all current and future capital and operating expenses associated with the ownership of an asset. World Resources Institute, https://electricschoolbusinitiative.org/all-about-total-cost-ownership-tco-electric-school-buses
[10] https://ospi.k12.wa.us/sites/default/files/2024-11/pe-ospi-tco-final-111224.xlsx
[11] https://ospi.k12.wa.us/sites/default/files/2024-12/12-24-zero-emission-school-bus-survey.pdf

Grant Program Status Update

Ecology's clean diesel grant program background

Ecology's Clean Diesel Program began in 2002 and has a goal to protect people from toxic diesel emissions and reduce greenhouse gas emissions. Transitioning school buses to zero-emission reduces both harmful emissions, improving air quality directly in communities across Washington. This is important because children are especially vulnerable to the negative health impacts of diesel; therefore, by transitioning to zero-emission school buses, we are reducing the risks of asthma and lung damage, and ensuring children have cleaner air to breathe.

In the 2021-23 Biennium, the Legislature appropriated $13.4 million from the Capital Budget to Ecology Clean Diesel Grant Program. The grant program focused on scrapping and replacing older diesel school buses with new zero-emission school buses and supported 20 grant recipients in purchasing 39 zero-emission school buses (Figure 1). This grant program expanded on the 2019-21 Biennium State Volkswagen Settlement Replacing School Buses with All-Electric School Buses grant program.[12]

Figure 1: Walla Walla School District zero-emission school bus

Washington state has 295 public school districts and six state-Tribal education compact schools serving approximately one million students. As of March 2024, there are over 10 thousand buses driven by over eight thousand bus drivers providing nearly three quarters of a million trips per day and travelling over 100 million miles per year.

[12] https://apps.ecology.wa.gov/publications/documents/1902022.pdf

Diesel exhaust is the state's highest risk toxic air pollutant and is a known carcinogen and contributor to climate change. Over 20% of the current bus fleet was manufactured before 2010 and does not meet the U.S. Environmental Protection Agency's (EPA) 2010 nitrogen oxide emissions standards. Additionally, 12% of the fleet were manufactured before EPA's 2007 diesel particulate emissions standards too effect.

Widespread community exposure to diesel exhaust occurs when many engines operate or idle in concentrated areas. Communities located near major highways and road networks often include people who are economically disadvantaged, communities of color, and Tribal communities. These populations are disproportionately exposed to higher amounts of pollution than people in other areas. It is an important public health and environmental justice concern and a high priority for Ecology to continue reducing these emissions.

The transition from diesel to zero-emission school bus fleets requires planning, investment, and time to coordinate and implement. Ecology is coordinating closely with a network of partners including:

- Washington Office of Superintendent of Public Instruction (OSPI) Student Transportation,[13] which provides essential services to support the safe and efficient transportation of Washington students
- Washington State University Energy Program's Green Transportation Program,[14] which provides educational resources as well as direct project support to school districts
- World Resources Institute's (WRI) Electric School Bus Initiative,[15] which provides education and support to transition the nation's school bus fleet to electric including TCO calculations
- EPA's Clean School Bus Program[16], which provides federal funding for zero-emission school buses

According to current state specification quotes, the upfront cost for a zero-emission school bus is higher than a comparable diesel school bus by $230,000 for a Type A bus and $331,000 for a Type D, not including the associated charging infrastructure.[17] Transforming the state's school bus fleet to zero-emissions without grant funding places a large financial strain on school district budgets. This grant program provides funding to incentivize the replacement of older, highly polluting buses with zero-emission school buses.

In addition to the health and climate benefits of an earlier transition, the grant program also allows school districts to test and incorporate the new technology into their existing fleets. Supported by the grant funds in the years before the TCO of diesel and zero-emission buses

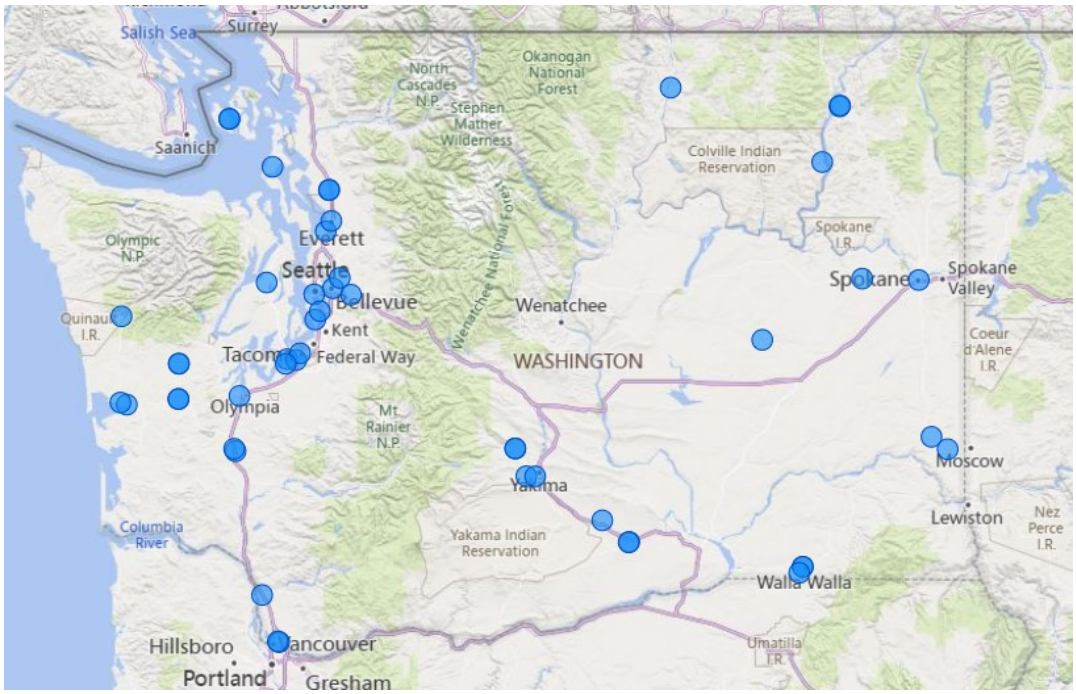
[13] https://ospi.k12.wa.us/policy-funding/student-transportation
[14] https://www.energy.wsu.edu/GreenTransportationProgram/ElectrifyingStudentTransportation.aspx
[15] https://www.wri.org/initiatives/electric-school-bus-initiative
[16] https://www.epa.gov/cleanschoolbus
[17] https://ospi.k12.wa.us/policy-funding/student-transportation/2024-25-state-quote-specifications

are equal, school districts can prepare for a smoother transition, learn about the new technology, assess potential challenges, and begin infrastructure and fleet planning efforts. The implementation considerations section of this report expands on the support that will be necessary for school districts to transition to zero-emission fleets.

Grant program implementation status

During the 2023-25 Biennium, Ecology's Clean Diesel Program offered two Zero-Emission School Bus Grant Program opportunities and one Vocational Training Program grant opportunity to support the transition of Washington's school bus fleets to zero-emissions. Locations of grant projects are shown in Figure 2.

Figure 2: FY2023-25 Zero-Emission School Bus Grant Program locations



Ecology received funding from the 2023-25 Capital Budget, the 2024 Supplemental Transportation Budget via a Washington State Department of Transportation (WSDOT) Interagency Agreement, and the 2024 Supplemental Transportation Budget (Table 1).

Table 1: Clean Diesel Grant Program Funding Sources

Fiscal Year (FY) 2023-25 Clean Diesel Funding Sources	**School Bus Pass Through Funding Amount**	**Other Clean Diesel Projects & Administrative Costs**
2023-25 Capital Budget Ecology	$14,000,000	$1,632,000

2024 Supplemental Transportation Budget WSDOT Program K	$20,000,000	-
2024 Supplemental Transportation Budget Ecology	$19,000,000	$715,000
Total appropriated funds	$53,000,000	$2,347,000

In August 2023, Ecology's Clean Diesel Program executed the first round (Round 1) of Zero-Emission School Bus Program grant funding for FY 2023-25.[18] Funding for Round 1 was appropriated through the 2023-25 Capital Budget for the Clean Diesel Program and obligated prior to the enaction of RCW 70A.15.4200 in 2024.[19] Of the $15.6 million appropriated to the Clean Diesel Program to reduce greenhouse gases and toxic emissions, $14 million was allocated to replace diesel school buses with zero-emission buses. Round 1 funded the replacement of 42 diesel school buses with all-electric buses including the associated charging infrastructure for 25 school districts (Table 2).

In July of 2024, Ecology's Clean Diesel Program executed Round 2 of the Zero-Emission School Bus Program grant funding for FY 2023-25[20] that included new requirements outlined in RCW 70A.15.4200.

To date, Ecology has committed all appropriated funds to 29 school districts under Round 2 to replace 88 diesel school buses with zero-emission school buses (Table 2). In this grant round, Ecology received more requests for funding than funds available. The unmet need from this funding opportunity is approximately 36 buses.

Table 2: Grant Output Summary

Grant type	**Number of Grants**	**Number of diesel buses replaced with zero-emission buses**
ECY Round 1	25	42
ECY Round 2	29	88
Total	53	130

In accordance with RCW 70A.15.4200, grant recipients were allowed to combine (stack) funding from other sources with Ecology's Round 2 grants, including Ecology Round 1 grants, EPA Clean School Bus grants or rebates, or other funding sources for zero-emission buses

[18] Ecology Publication 23-02-095, https://apps.ecology.wa.gov/publications/summarypages/2302095.html
[19] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.15.4200
[20] Ecology Publication 24-02-014 https://apps.ecology.wa.gov/publications/SummaryPages/2402014.html

and/or charging infrastructure planning, design, and installation. As a result, 18 Round 2 grantees chose to stack with other funding sources. Grant guidelines ensure that combined funding does not exceed the total cost of buses. All Round 2 recipients were also required to provide contact information for the electrical service utility to allow Ecology to provide utilities with a notice of grant award in their coverage area, as required by RCW 70A.15.4200.

In February 2024, Ecology's Clean Diesel Program allocated approximately $820,000 of FY 2023-25 funding for Vocational Training programs that include Career and Technical Education (CTE) and workforce development training.[21] Funding for this grant opportunity was appropriated through the FY2023-2025 Capital Budget for the Clean Diesel Program to help transition and prepare the workforce needed to support zero-emission vehicles and infrastructure.

Grant funding was awarded to develop college preparatory courses for a "Renewable Energy Vehicle and Infrastructure Technician" (REVIT) training program. REVIT curriculum will be made available free of charge nationally for use in grades 10-12 CTE programs as well as in college CTE programs. Funding for workforce development training was allocated to help school districts develop basic electric school bus operation and maintenance training programs. Grant supported programs include a hands-on, cohort-based program that can equip school districts in Washington state with the knowledge, tools, and networks to transition to an electric school bus fleet.[22]

Summary of recommendations and implementation considerations

The current school bus funding structures do not allow for a fleet-wide transition from diesel school buses to zero-emission school buses. The funding structure to support school districts in purchasing new school buses is the school bus depreciation schedule and is based on a district's existing fleet. The funding structure for operational expenses consists of annual allocation calculations that cover fuel, maintenance, and other costs. Diesel buses and electric buses have different capital and operating costs over the lifetime of the bus. These funding structures need to be modified to address those cost differences so school districts have sustainable funding to support zero-emission fleets when TCO becomes equal. Additionally, the transition itself will need to be supported by the existing Zero-Emission School Bus Grant Program to incentivize the transition to zero-emission and support the cost difference between diesel and zero-emission and charging infrastructure costs. The recommendations and implementation considerations below are intended to guide the discussion about this transition.

[21] Ecology Publication 24-02-005, https://apps.ecology.wa.gov/publications/SummaryPages/2402005.html
[22] Electric School Bus Accelerator, https://www.breakingbarrierscollaborative.org/e-school-bus-accelerator

Recommendations

Ecology recommends the following for transitioning the Zero-Emission School Bus Grant Program to the school bus vehicle depreciation schedule established in RCW 28A.160.200.[23]

Recommendation 1: Align transportation funding structure

Recommendation 1a: Review and align tracking, reporting, and budgeting of zero-emission school bus costs to ensure funding reflects the costs identified in the total cost of ownership (TCO).[24]

The operation of zero-emission school buses, charging infrastructure, and other supporting infrastructure will require OSPI to consider different operational expenses, as identified in the preliminary TCO. New costs that are currently not considered transportation funding will need to be identified, such as propulsion battery replacement and above-ground charging infrastructure. Once costs have been identified, allocation calculations need to be updated to include all costs associated with operating zero-emission buses as identified in the TCO. This change will enable anticipated operational cost savings to be realized. Legislative action will likely be necessary to align these new operational expenses with school district transportation funding allocations and eligible uses of funds.

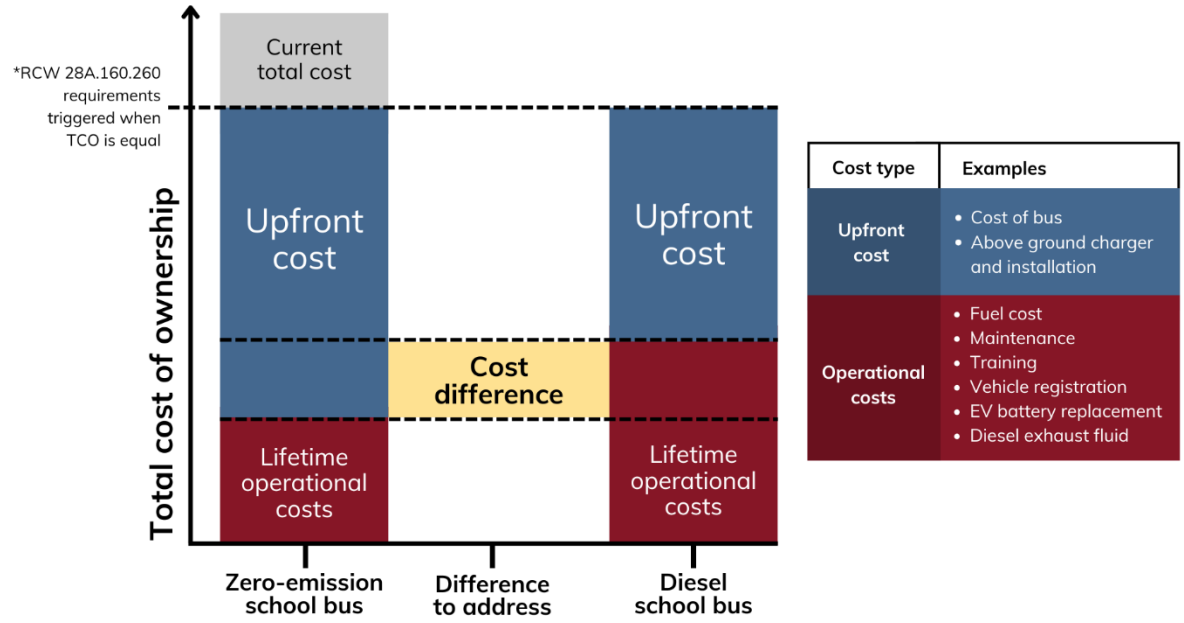
Recommendation 1b: Address the up-front cost difference between zero-emission school buses and diesel school buses once TCO equalizes.

TCO takes both capital and operational expenses into account. Current funding mechanisms that support school bus fleets separate capital (via depreciation schedule) and operational expenses. Due to the existing structure, even when TCO of a zero-emission bus is equal to a diesel bus, school bus owners will not be able to capture the operational savings to offset the higher upfront cost of a zero-emission bus, as highlighted in the 'cost difference' in Figure 3.

[23] https://app.leg.wa.gov/rcw/default.aspx?cite=28a.160.200

[24] Total cost of ownership is the sum of all current and future capital and operating expenses associated with the ownership of an asset

Figure 2: Likely scenario and funding gap when total cost of ownership (TCO) equalizes (not to scale)



The gap identified here must be addressed until either an individual fleet has transitioned to zero-emission and additional bus replacements are supported by the Transportation Vehicle Fund[25] or the upfront cost of zero-emission school buses, including required above-ground charging infrastructure, is equal to the upfront cost of conventional buses.

Legislative action will likely be necessary to align the current funding structure with a system that supports the different cost structures of zero-emission school bus fleets.

Recommendation 2: Fund the Transition

Recommendation 2a: Maintain consistent and adequate funding of Ecology's competitive Zero-Emission School Bus Grant Program until OSPI's transportation funding can support all districts' access to zero-emission school buses.

RCW 70A.15.4200,[26] codified in 2024, directs Ecology to administer the Zero-Emission School Bus Grant Program. The FY 2025-27 capital and transportation budgets provide funding for this program.

On average, the 2024-2025 upfront cost difference between zero-emission and diesel (or gasoline) school buses ranges from $230,000 for Type A buses up to $331,000 for Type D buses.[27] Washington state's school bus fleet purchases approximately 700 buses each year.

[25] *Transportation vehicle fund (TVF)* holds depreciation payment deposits. Allowable uses of the TVF are defined in RCW 28A.160.130, https://app.leg.wa.gov/RCW/default.aspx?cite=28A.160.130

[26] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.15.4200

[27] https://ospi.k12.wa.us/policy-funding/student-transportation/2024-25-state-quote-specifications

With the funding Ecology received, the Zero-Emission School Bus Grant program will support the replacement of approximately 45 school buses in the 2025-27 Biennium. This estimate is based on 2023-25 Biennium grant program and is subject to change based on 2025-27 bus prices, the expiration of the EV bus sales tax exemption, and new grant program design. Ecology's competitive grant program prioritizes school districts as required by RCW 70A.15.4200. Funding zero-emission school buses now improves children's health while giving school districts time to adopt new technology. The EPA Clean School Bus[28] program has complemented the state program. Uncertainty and potential rollback of that program could put additional pressure on our state program.
To better estimate future grant program funding, Ecology will develop a project list to inform the Clean Diesel Program's future funding requests. This grant program is necessary until the cost of zero-emission school buses drops or sufficient funding is available to allow all districts access to zero-emission buses.

Recommendation 2b: Ensure adequate funding for replacement and maintenance costs for above-ground charging infrastructure.

Zero-emission vehicle TCO calculations include costs for maintaining above-ground charging infrastructure such as charging cables, touch screens, pedestals, etc. Charging infrastructure installations will gradually expand to support zero-emission school bus adoption. To keep pace with vehicle and energy management technology advancements, charging infrastructure technology must be maintained and replaced.

Currently, the existing funding mechanisms are not able to sustainably support above-ground charging infrastructure maintenance or replacement costs.

Implementation considerations

Most school bus fleets in Washington that have purchased zero-emission buses have done so on a small scale, replacing a fraction of their fleet. As fleets take larger steps towards zero-emission buses, it is important to consider longer term infrastructure planning and installation. The implementation considerations outlined below will help pave the way for a smooth transition.

Anticipate and address additional infrastructure costs and extended timelines

Beyond installing charging infrastructure, significant utility and school district facility upfront costs need to be addressed. These costs have the potential to be large and highly variable depending on school district size, location, climate, and utility. Reports from other states

[28] https://www.epa.gov/cleanschoolbus

indicate that infrastructure installation will be the bottleneck for zero-emission school bus adoption and therefore needs to be addressed before fleet-scale adoption.[29]

Zero-Emission School Bus Grant Program recipients have communicated that utility costs and barriers can include power distribution, additional transformer needs and competing grid priorities.

As captured in OSPI's Zero-Emission School Bus Survey, school districts anticipate costs including bus sheds (for cold weather operations), additional facilities and parking, and additional maintenance equipment.[30]

Consider secondary support (labor force development) essential for successful transition to zero-emission fleets

Skilled electricians and mechanics who can maintain electric school buses and infrastructure are necessary to transition the entire fleet sustainably. Workforce development will be vital at the district level but also must be addressed for the broader workforce as the state's entire fleet transitions to zero-emissions over the coming decades**.** To support development of this workforce, training programs are key; trained staff will ensure buses stay on the road and safe.

Create zero-emission school bus transition roadmap(s)

Roadmap(s) should include adequate guidance and resources to enable districts to manage the transition from fossil-fueled buses to zero-emission buses, focusing on infrastructure and workforce needs. Building these transition roadmaps on a local scale will generate the required buy-in and ownership from affected districts. Currently, many districts are not planning for transportation electrification; those school districts that have adopted zero-emission buses are taking a piecemeal approach to fleet electrification. OSPI's Zero-Emission School Bus Surveys indicated that 64 of the 77 respondents identified charger/infrastructure as a barrier to transitioning to zero-emission school buses, and 45 of 77 respondents have not studied infrastructure capacity.[31] Districts need equitable and adequate support to conduct thorough fleet transition planning as outlined by this roadmap.

The zero-emission school bus transition roadmap(s) should include the following components:

- Planning capacity
- Planning tools for districts including:
    - Readiness assessments
    - Infrastructure needs assessment and prioritization support

[29] https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/sb-350-te/srp-ab10821083-2023-evaluation-report112024.pdf
[30] https://ospi.k12.wa.us/sites/default/files/2024-12/12-24-zero-emission-school-bus-survey.pdf
[31] https://ospi.k12.wa.us/sites/default/files/2024-12/12-24-zero-emission-school-bus-survey.pdf

- Funds for temporary staff to provide district-level support for charging infrastructure planning, including energy manager positions at school districts/regions to increase efficiency, negotiate power rates, and reduce operating costs
- Collaboration with the Washington State University Energy Program's Green Transportation Program to provide technical assistance and support partnerships with electric utilities
- Implementation tools including:
    - Major infrastructure needs
    - Implementation timelines
    - Create a funding request system for major infrastructure needs. This will enable prioritization based on district needs.

Consider actions to reach TCO parity sooner

TCO parity is when the total cost of ownership of zero emission school buses is at or below the total cost of ownership of diesel school buses. Zero-emission school bus costs are driven by labor, materials, market competition, availability, and state and federal regulatory standards.

To reduce upfront costs and reach TCO parity sooner, consider discussing with manufacturers how to increase school bus models available in Washington, investigating opportunities for bulk purchasing, and exploring why battery costs are dropping but zero-emission vehicle purchase prices continue to rise.

Consider the changing policy and funding context

During this transition, it will be important to keep in mind the new federal attempts to end the enforceability of motor vehicle emission standards in Washington such as Advanced Clean Trucks and Heavy-Duty Low NO_x Omnibus, both of which impact school bus manufacturers. Additionally, shifting federal funding priorities and state-level funding availability will impact the transition.

Next Steps

Ecology will continue to administer the Zero-Emission School Bus Grant Program in alignment with RCW 70A.15.4200, dependent on funds appropriated by the legislature. OSPI will finalize and adopt rules establishing TCO formulas in consultation with Ecology, as required in RCW 28A.160.260.

Conclusion

School buses are community-based vehicles that drive primarily through neighborhoods and communities. By transitioning from harmful diesel to zero-emission, Washington is directly reducing emissions within communities. This is important because children are especially vulnerable to the negative health impacts of diesel, like asthma and lung damage. In addition to ensuring children have cleaner air to breathe, transitioning to zero-emission school buses will help reach Washington's climate goals.

In 2024, RCW 70A.15.4200 established the Zero-Emission School Bus Grant Program. To-date Ecology has committed all funds appropriated in the current biennium for the grant program and received more funding requests than funds available. This grant program supports replacements of older polluting diesel buses and ensures that health and climate benefits are realized during the transition of the grant program to the school bus depreciation schedule.

Further discussions about this report's recommendations to identify costs and savings, align funding structures, and plan for infrastructure will be needed to ensure that fleets will be fully funded and fully operational. The transition to a zero-emission school bus fleet will require collaboration between Ecology, OSPI, school districts, and partners.

Publication information

This report is available on the Department of Ecology's website at https://apps.ecology.wa.gov/ecy/publications/SummaryPages/2502012.html

Related Information

Publication 24-02-040: Focus on: Electric School Bus Grants[32]

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[32] https://apps.ecology.wa.gov/publications/SummaryPages/2402040.html
[33] www.ecology.wa.gov/contact