



## **Strategies and Solutions for Cleaner and Healthier Air**

**Montana Association of Pupil Transportation Meeting  
June 23, 2021**

**Neal Ullman  
Montana Energy Office  
Department of Environmental Quality**



# Outline

Air pollution impacts

Solutions

- School buses
- Reducing bus/vehicle idling
- Switch to alternative fuels

Funding opportunities

- DERA
- Volkswagen Settlement



# Air Pollution Primer

Stationary sources (e.g. power plants) and mobile sources (vehicles) emit pollutants that impact air quality

EPA has identified 188 Hazardous Air Pollutants called “Air Toxics”

Mobile sources represent the largest contributor to air toxics nationwide



**Haze over Missoula**

# Air Pollution Health Impacts

- NO<sub>x</sub> and SO<sub>x</sub> emitted from diesel/gas engines contribute to “smog” and haze.
- Air pollution and particulate matter are known to cause cancer, respiratory effects, birth defects and other serious health issues.
- Children are especially susceptible to air pollution from vehicle exhaust.
- Children’s developing lungs inhale **50%** more air per pound of body weight than adults.
- This can lead to greater exposure to, and damage from, air pollution.



# Solution: Riding the Bus

---

School buses decrease air pollution by reducing miles travelled by personal vehicles.

Reducing gasoline consumption cannot happen without school buses.

If the students on **one** school bus were driven to school in 20 private vehicles, it would result in:

3x's more carbon monoxide emissions

2x's more nitrous oxide emissions

5x's more carbon dioxide emissions

# Solution: Reducing Idling

Idling increases children's exposure to diesel exhaust in 3 ways:



**Accumulates inside of the bus**



**Enters school through air intakes**



**Direct exposure when kids are loading and unloading**

# Reducing Idling (cont'd)

If every school bus operating in the U.S. were to idle for just 2 minutes less per day:

- Exhaust emissions during a school year would be reduced by:

**41 tons  
greenhouse  
gas-causing  
emissions**

**319 tons  
of Carbon  
monoxide**

**185 tons of  
Nitrogen  
oxides**

- **1.5 million** gallons of fuel saved
- Reduce equivalent of **21 million** road miles of unnecessary wear and tear on school bus engines



# Strategies: Reducing Idling – How?

---

Driving slow and steady for the first few minutes, rather than idling- it's also better for the engine.

Stopping and starting the bus uses less fuel and does not negatively impact the engine.

Buses with auxiliary heaters are available that will heat the bus interior in the winter.

Auxiliary heaters use about  $\frac{1}{2}$  cup of fuel per hour compared with  $\frac{1}{2}$  gallon when idling to keep the bus warm.



# Reducing Idling – Posting Signs at Schools



# Solution: Switching to Alternative Fuels

---

Alternative fuels are those fuels that are derived *partly* or *wholly* from a source other than petroleum

Propane and battery electric are the most common alternative fueled school buses

Environmental and economic benefits and tradeoffs with each type of fuel

# School Bus Fuel Type Comparison

<b>Fuel/Engine Type</b>	<b>Upfront Cost</b>	<b>Fuel cost (\$/mile)</b>	<b>Fuel economy (mpg or mpge)</b>	<b>Annual GHG Emissions (tons)</b>	<b>Annual NOx Pollutants (pounds)</b>
<b>Diesel</b>	<b>\$95K- \$115K</b>	<b>\$0.33/mile</b>	<b>8.2</b>	<b>25.09</b>	<b>37.69</b>
<b>Gasoline</b>	<b>\$95K- \$115K</b>	<b>\$0.36/mile</b>	<b>6.8</b>	<b>29.94</b>	<b>6.78</b>
<b>Propane</b>	<b>\$90K- \$100K</b>	<b>\$0.28/mile</b>	<b>6.8</b>	<b>25.94</b>	<b>6.78</b>
<b>Low NOx propane</b>	<b>\$90K- \$100K</b>	<b>\$0.28/mile</b>	<b>6.8</b>	<b>25.94</b>	<b>2.71</b>
<b>Battery Electric</b>	<b>\$290K- 350K</b>	<b>\$0.004/ mile</b>	<b>24</b>	<b>8.94</b>	<b>0</b>

# DEQ Funding Opportunities

DEQ will soon accept applications for Montana school districts statewide that would like to replace older diesel buses with battery electric, low NOx, propane or new diesel buses. Eligible bus model years and funding information is included below. DEQ is prioritizing an electric school bus project.

Eligible Replacement Bus/Engine Technology	Battery Electric School Bus	School Bus with Certified Low NOx Engine	Propane or New Diesel Bus with Emissions Model Year 2016 or Newer
Eligible existing bus engine model years to be replaced	1996 – 2019	1996 – 2019	1996 – 2009
DEQ Clean School Bus funding limits	45% or \$148,500 whichever is less (includes charging infrastructure)	35% or \$31,500 whichever is less	25% or \$22,500 whichever is less
Required school district/applicant cost share	55%	65%	75%
Fueling infrastructure eligible for funding?	Yes - dedicated electric bus charging infrastructure	No	No

# DEQ Funding Opportunity: Volkswagen Settlement Funds

Category	EMA* Category	Percent of Funds	Total Funds
Onroad Heavy Duty Diesel Vehicles	Categories 1,2,6	55%	\$6.93 million
Funding for projects based on demand	Categories 1-4,6-8, 10	10%	\$1.26 million
Light Duty Zero Emission Vehicle Supply Equipment (EVSE)	Category 9	15% (maximum allowed)	\$1.89 million
DERA Option/Nonroad	Categories 1-4, 6-8, 10	5%	\$630,000
Administration /Marketing/Education		≤15%	No greater than \$1.89 million
* Eligible Mitigation Action			TOTAL = \$12.6 million



# Summary

---

Air pollution = bad

- ✓ We should endeavor to reduce it in cost-effective ways

We can reduce air pollution

- ✓ More bus use
- ✓ Reduced idling of buses
- ✓ Cleaner buses

There are programs to help

- ✓ DERA
- ✓ VW Mitigation



## Questions?

Neal Ullman  
Energy Resource Professional  
406-444-6582

[Neal.Ullman@mt.gov](mailto:Neal.Ullman@mt.gov)

<https://deq.mt.gov/energy/Programs/fuels>

