Clean Air
FOR SCHOOLS
Engines OFF!

Caution: Children Breathing

An overview of air pollution and idling vehicles at Colorado schools

AMERICAN LUNG ASSOCIATION of Colorado

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGIONAL AIR QUALITY COUNCIL

DENVER
THE MILE HIGH CITY

ENVIRONMENTAL HEALTH
Promoting Healthy Communities

Clean Air for SCHOOLS Engines OFF!

Clean Air at Schools: Engines Off (CASEO) is a partnership between federal and local governments, schools and non-profits in Colorado.

CASEO's goal is to develop programs that will reduce air toxics exposures at schools in Colorado. This project will support the goal by 1) installing advanced emissions controls on school buses and 2) conduct a social marketing program to reduce idling of personal vehicles at schools.

For more information on pollution from idling or advanced emission controls such as diesel retrofits, visit **www.EnginesOff.com.**

Idling Background

Vehicle idling is a significant source of air pollution.[1] The EPA estimates that an idling vehicle produces about 4.8 grams of carbon monoxide per minute while idling. That means **one minute of idling produces more carbon monoxide than the smoke from 3 packs of cigarettes.**[2] Is that what you want to expose your kids to?

> One minute of idling produces more carbon monoxide than the smoke from 3 packs of cigarettes.

In Metro Denver, idling is estimated to contribute over 40,000 tons of harmful air pollution a year. Every year over 40 million gallons of fuel is wasted on idling, costing residents and businesses over $100 million annually.

School Air Quality and Idling

In 2004, DEH obtained grant funding from the United States Environmental Protection Agency (EPA) to conduct a Community Based Air Toxics Study.[3] This project measured the various levels of pollution in Denver by collecting ambient air samples at four different locations for a period of one year (June 05-May 06).[4]

Two of the four monitoring sites in the project were located on the rooftops of Denver Public Schools. Monitoring data from these sites showed concentrations of benzene, formaldehyde, acetaldehyde and other air toxics to be at levels exceeding established health benchmarks

The data collected on the rooftop of Swansea Elementary showed that there were noticeable spikes in pollution during the 3-4pm hour (see graph 1). This period of day corresponds to students being released from school and these elevated concentrations of hazardous air pollutants (HAPs) are likely resulting from the vehicles associated with student commuting.

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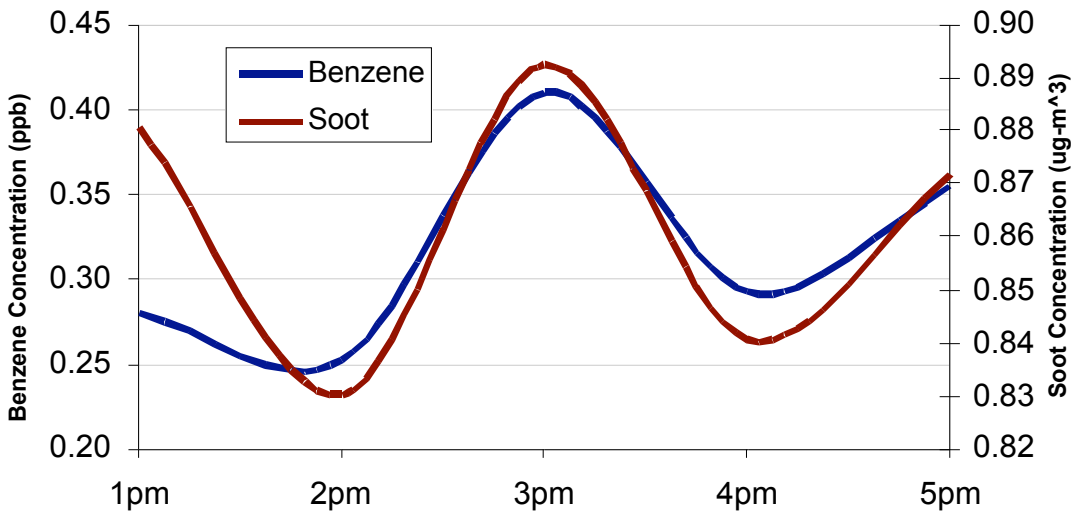
[1] US EPA, 2008. National Idle Reduction Campaign: http://www.epa.gov/cleanschoolbus/antiidling.htm
[2] US EPA, 2000. Air Quality Criteria for Carbon Monoxide.
[3] Thomas, G.W., S.W. Williams, D.L. Bain. 2008. *Community Scale Air Dispersion Modeling in Denver: Airing on the Side of Caution.* Report available at: www.denvergov.org/EAP
[4] For more information, or to receive a copy of the final report, contact Sabrina Williams at Sabrina.williams@denvergov.org

Graph 1: Swansea Air Pollution Monitoring Results

Airing on the Side of Caution partial graph



CASEO will reduce emissions from vehicles by reducing the **number** of idling vehicles, as well as the **total duration** of idling at schools. The schools selected to pilot this program are Swansea Elementary (Denver Public Schools), Mitchell Elementary (Jefferson County Public Schools), and Ryan Elementary (Boulder Valley Public Schools).

Mitchell elementary typical afternoon pick up (2008).

Pilot School Observations

As the first step of CASEO, field observations were conducted to accurately assess the amount of idling taking place at the schools. Observations create a starting point for

CASEO and provide a means to evaluate its effectiveness by taking pre and post project measurements.

Teams of observers collected data for four afternoons on August 19-22, 2008 as school let out at each location. The observation periods lasted from time vehicles began arriving, until all the vehicles picking up students had left—usually about 30-40 minutes. Observers recorded the arrival and departure time of all vehicles, if and how long they idled, the weather, and the type of vehicle. No license plate numbers, personal or identifying information relating to students or drivers was collected.

On average 90 vehicles arrived every day to pick up students at each school, and 1/3 of those vehicles idled while waiting, see table 1 below.[5] For those vehicles that idled, the average duration of their idling was about 7 minutes. The average total idling time of all vehicles combined was 3 hours and 40 minutes per day per school. Table 1 below summarizes the average results by school.

> The average total idling time per school was 3 hours and 40 minutes per day!

Table 1: Idling Observations Results

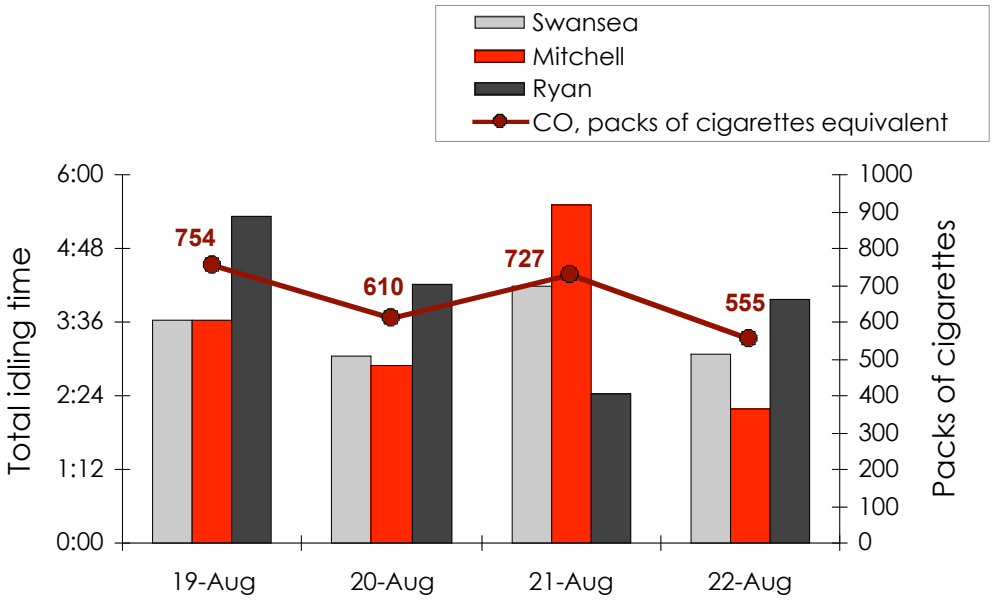
Averages for the four days of August 19-22, 2008 during after-school pick-up.

	Vehicles per day	Percentage of vehicles idling	Average time spent idling per idling vehicle	Total cumulative idling duration of all vehicles combined
Swansea	91.3	32%	7 minutes	3 hr 29 min
Mitchell	91.0	36%	6.5 minutes	3 hr 33 min
Ryan	92.5	32%	8 minutes	3 hr 59 min
Average of all three schools	**91.6**	**34%**	**7 minutes**	**3 hr 40 min**

The pollution resulting from the cumulative average daily idling duration totals was estimated using the EPA's emissions model. Though it is invisible and odorless, carbon monoxide is one primary toxins contained in both vehicle exhaust and cigarette smoke. Graph 2 shows that **every day idling vehicles at each school emit significant amounts of carbon monoxide—equivalent amounts to what would result from the smoke from hundreds of packs of cigarettes.** Children's lungs are still developing and when they are exposed to elevated levels of these pollutants, children have an increased risk of developing asthma, respiratory problems and other adverse health effects.

[5] For the compete results of the observations please refer to www.EnginesOff.com

Graph 2: Daily idling times by school and average daily carbon monoxide emissions in equivalent packs of cigarettes



Focus Groups

After observations confirmed that significant idling occurs at the pilot schools, Focus Quest Market Research was commissioned to moderate two focus group sessions in October. The participants in these focus groups were parents recruited by CASEO partners at Mitchell and Swansea. These schools represent different school districts and two different socioeconomic groups but have comparably sized student populations.

The objectives of these focus groups were to determine: the extent to which parents understood the harmful effects of idling, the level of awareness of idling behaviors at the school site, what types of messaging would effect change in idling behaviors, and finally which authority on air quality was best suited to deliver appropriate messaging.

Focus Group Recommendations

Traffic Patterns Around Schools. Parents in both groups were very concerned about the traffic flow around their schools. As part of CASEO, it is recommended that the school staff revisit the traffic rules of their drop off zones and make it clear to parents not to double-park, or linger in the drop off zones. If schools can get their car pool lanes to move faster, there would be a reduction in air pollution. Encouraging parking, walking and separate carpool lanes would also reduce idling behaviors.

Air Quality Authorities. Mitchell parents have a strong desire to receive statistics and information from air quality specialists and government agencies. CASEO is a collaborative of those very authorities and will use their enforcements on materials.

Methods of Communication. Both groups indicated they would like to receive information in many ways, but the most important will be from their school administrators. In order for CASEO materials to be seen and successfully acted upon, the principals of the schools should be on board to support and coordinate the messenger, RACQ and MCAC. A letter should be sent home in the child's school folder indicating that their school has been chosen as a pilot school to reduce idling and ask for parental support. Another concept is to have a kick-off meeting coordinated by MCAC and the PTA for parents to receive information about how CASEO will be implemented at their school and show that this program is endorsed by their principal.

Table 3: Communication preferences

Swansea Parents:	Mitchell Parents:
• Information flyers on doors	• Friday Folder, principal's letter
• Memo from principal	• Mitchell & City Council Websites
• TV	• Community/School Meeting
• Focus Group (Community Meeting)	• Posters (Child Made)

Student Involvement. It is important to include students. They could design posters for the school as well as to have ask their parents to sign a pledge not to idle.

Marketing Materials. Posters and signage offer a quick way to convey information and change behaviors. Signs and posters should be placed in high traffic areas, especially in the car pool lane. Prompts that remind drivers to turn on and off their cars while waiting in the car pool lane are also likely to be effective and vary between the schools.

Next Steps

The next step is to share CASEO with parents and ask for their support. CASEO has drafted the accompanying letter to begin the process.

After parents have been informed of CASEO, the partners will begin implementing anti-idling strategies, such as signage, pledges, and direct outreach. Schools can engage students as they are able. A final report will be developed that assesses the effectiveness of CASEO and determines whether this project should be expanded to additional schools in Colorado.

For more information contact:

Mothers for Clean Air Colorado
motherscac@hotmail.com
303-913-1545

or

Regional Air Quality Council
tnoel@raqc.org
303-629-5450

DID YOU KNOW?

1. Ford Motor Company says: "Avoid idling more than 30 seconds (when not in traffic)—Frequent restarting has little impact on the battery and starter (maybe $10 a year), whereas excessive idling can actually damage important components such as engine cylinders, spark plugs, and the exhaust system."

2. For modern cars with fuel-injection, idling 10 seconds uses more gas than restarting your engine.

3. Idling pollutes the air outside and in your vehicle. Pollution from exhaust contributes to lung infections, pneumonia, influenza and asthma.

4. Most people waste 1-2 entire tankfuls of gas every year by idling.

5. Just 1 minute of idling puts more carbon monoxide into the air than three packs of cigarettes.

6. Every minute counts: in the Denver Metro Area, everyone's idling adds up to cause over 40,000 TONS of harmful air pollution and 400,000 Tons of Greenhouse gas emissions every year.

7. Observations over several days at **Mitchell** measured cars, trucks, and SUVs idling for a combined total of almost 4 HOURS per day of idling while waiting to pick up students. 4 hours of idling a day adds up to:

   a) 360 gallons of fuel wasted per year. That means schools families are spending over $1,300 per year to turn gas into pollution at the school.

   b) 10 gallons of fuel burned up and exhausted into the school's air every week.

   c) Over 600 pounds of carbon monoxide, volatile organic compounds, and other harmful pollutants exhausted into the air at the school every year**.**

   d) More carbon monoxide every day than is in the smoke from 720 packs of cigarettes.

Just turn the car key, it's easy.

Please remember:

Children breathing: turn your engine off

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