

**COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection**



**Response to Petition for
Development of a Statewide Idling Reduction Regulation**

April 2007

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I. INTRODUCTION

Moving freight by truck and passengers by bus contributes to our country's economic prosperity, but is not without environmental consequences. Diesel exhaust ranks among the air pollutants that the United States Environmental Protection Agency (EPA) believes pose the greatest health risks.¹ Unnecessary idling (the continuous operation of the vehicle's engine while it is stopped) contributes to the emissions of diesel exhaust. Diesel vehicles may idle for driver and passenger comfort and to protect the engine in cold weather, but there are ways to eliminate unnecessary idling that not only benefit the environment but can also save diesel fleet owners and operators money. EPA estimates that idling by long-haul diesel trucks consumes around 1 billion gallons of fuel annually.² The voluntary approaches taken to date by the Department and EPA are limited in addressing impacts of diesel emissions from existing diesel fleets.

Pennsylvania does not have a statewide anti-idling statute or regulation. However, local air pollution control agencies at health departments with jurisdiction over the Commonwealth's two largest cities, Philadelphia and Pittsburgh, do have anti-idling ordinances and regulations. Philadelphia County's regulation dates from 1972. Allegheny County's anti-idling regulation was recently adopted in 2005.

Because of the health implications of diesel emissions, both the Pennsylvania Department of Environmental Protection (Department) and EPA have encouraged voluntary reduction of unnecessary idling, including education and information sharing as well as some financial assistance for idling reduction equipment. However, more could be done to encourage trucks and buses to reduce idling while preserving the safety of drivers, passengers and vehicles.

II. BACKGROUND INFORMATION ON THE PETITION FOR RULEMAKING

A. Clean Air Board of Central Pennsylvania (CAB) Petition

On October 18, 2006, the Clean Air Board of Central Pennsylvania (CAB) filed a petition for rulemaking, requesting that the Environmental Quality Board (EQB) adopt regulations to restrict the idling of commercial diesel-powered vehicles. The petition filed by CAB seeks to protect human health from adverse effects of particulate matter (PM_{2.5}) and reduce fuel consumption by limiting the idling time of commercial diesel vehicles. The petitioner asserts that a statewide regulation would be preferable to a patchwork pattern of local regulation for the trucking industry. The petitioner suggests regulatory language be added to 25 Pa. Code §§ 121.1 and 126.601 - 126.605, and requests that if a regulation is adopted, the regulation be included in the State Implementation Plan (SIP) for attainment of the National Ambient Air Quality Standards (NAAQS) for PM_{2.5}.

The program suggested by CAB would apply to "commercial diesel vehicles" at locations where they load, unload or park. The definition of "commercial diesel vehicles" would include

highway vehicles weighing 10,000 pounds or more, including trucks and buses. It would not include off-road vehicles such as construction or agricultural equipment. The proposed program would restrict any person from idling a commercial diesel vehicle, or allowing such idling to occur, for more than five minutes during any sixty-minute period at locations where these vehicles load, unload or park. The proposal would also hold facility owners responsible for idling occurring on their property. Certain exemptions are allowed for temperature, maintenance and safety considerations. For vehicles at terminals, truck stops or rest stops, a temperature-based exemption would be provided until April 30, 2010. There would be no exemption if any idle reduction technology facilities (electrified parking spaces) are provided and unoccupied at the location. Idle-reduction technologies, such as auxiliary power units, used by a truck operator to forego idling the main truck engine would be exempt from the time restriction.

CAB also submitted a similar petition to the Pennsylvania Department of Transportation (PennDOT).

B. Environmental Quality Board Petition Process

Persons may submit to the Environmental Quality Board (EQB or Board) a petition for rulemaking as provided under 25 Pa Code, Chapter 23 (relating to Environmental Quality Board policy for Processing Petitions – Statement of Policy). The EQB's Policy Statement outlines the procedures for processing a petition for rulemaking.

On January 17, 2007, the EQB accepted the CAB's petition for study. Notice of the EQB's acceptance of the petition was published in the *Pennsylvania Bulletin* on January 27, 2007, at 37 Pa.B. 477.

Upon the EQB's acceptance of the petition, the Department has 60 days to prepare a report evaluating the petition, including whether the EQB should approve the action requested in the petition. This report satisfies that requirement and discusses issues involved with the adoption of a statewide anti-idling regulation in general, using the petitioner's recommended regulatory language as a reference point. The report does not include a detailed analysis of the specific provisions of the petitioner's recommended regulatory language.

In accordance with 25 Pa Code §23.7, the Department is required to provide a copy of the completed report to the petitioner, who has 30 days to submit a written response to the Department. After conclusion of the petitioner's review period, the Department will prepare a recommendation to the EQB based on the report and the comments received from the petitioner. If regulatory amendments are recommended, the Department will develop a proposed rulemaking for EQB consideration within six months after the Department provided its report to CAB. If the Department does not recommend regulatory amendments, the Department will present its recommendation and basis to the EQB at the first meeting occurring at least 45 days after the Department mailed its report to the petitioner.

III. BACKGROUND INFORMATION ON EFFECTS OF DIESEL EMISSIONS

Diesel exhaust emissions have adverse health and environmental effects because they contribute to levels of particulates and ground-level ozone for which EPA has established ambient air quality standards. Diesel exhaust emissions also have adverse health effects when individuals are exposed directly. EPA is responsible for establishing allowable concentrations of pollutants, called National Ambient Air Quality Standards (NAAQS), to protect human health and the environment with an adequate margin of safety and has established these standards for particulate matter and ozone.

A. Particulate Matter

Fine particles or PM_{2.5} (those with a diameter of 2.5 micrometers or less) in the atmosphere are made up of a complex mixture of components. Some, like diesel particulate, are emitted directly into the air (“primary” sources) and others, such as sulfate and nitrate, form in the air as a result of various chemical reactions (“secondary” sources). The health effects associated with exposure to PM_{2.5} are significant and the evidence for these effects is compelling. Premature mortality, aggravation of existing respiratory and cardiovascular disease, decreased lung function and asthma attacks have been attributed to exposure.³

The NAAQS for PM_{2.5} was established in 1997 at 15 micrograms per cubic meter on an annual basis and 65 micrograms per cubic meter over 24 hours⁴. In 2004⁵, EPA designated the following areas in Pennsylvania as not attaining the NAAQS: the Harrisburg-Lebanon-Carlisle area, Johnstown (Cambria County plus several areas in Indiana County), Lancaster County, the five-county Philadelphia area, the Pittsburgh area (five counties plus portions in three other counties), Liberty-Clairton in Allegheny County, Reading (Berks County) and York (York County). Appendix A-1 shows the current PM_{2.5} nonattainment areas.

In October 2006, EPA lowered the 24-hour standard to 35 micrograms per cubic meter.⁶ Litigation to compel EPA to also lower the annual standard to less than 15 micrograms per cubic meter to be adequately protective of health is underway; Pennsylvania has joined that litigation. Based on data from 2003-2005, all of the areas listed above would violate the revised 24-hour standard and several additional areas would also violate the new standard. Pennsylvania will submit recommendations for the designation of nonattainment areas for the revised 24-hour standard to EPA in late fall 2007.

The major sources of direct PM_{2.5} in Pennsylvania as a whole, based on 2002 information, were residential heating, industrial processes, open burning and road dust. In 2002, highway diesel vehicles were responsible for about 3 percent of PM_{2.5} emissions in the Commonwealth. However, EPA and the Federal Highway Administration recognize that concentration of diesel-related highway sources can cause elevated local concentrations of PM_{2.5}.⁷ The contribution of idling to emissions from diesel vehicles is a small percentage of the highway vehicle emissions. Based on fuel consumption studies, EPA has stated in guidance that the agency believes long-duration truck idling emissions account for not more than 3.4 percent of the total Class 8 (33,001

lbs. Gross Vehicle Weight Rating or more) truck emissions for any criteria pollutant or precursor as estimated by the currently approved methodology (MOBILE6).⁸ EPA is expected to replace MOBILE with a new model that more accurately and separately addresses long-duration truck idling. This model is currently under development.

B. Toxic Air Pollutants

In addition to the health effects of ambient PM_{2.5}, EPA and other agencies have also evaluated the health effects of exposure to diesel particulate matter specifically. Diesel particulate matter tends to be very small particles, consisting of elemental carbon and hundreds of compounds that adsorb to the carbon. The small size of diesel exhaust particles allows them to be drawn deeply into the lungs. Diesel particulates are, for the most part, even smaller than 2.5 micrometers.⁹

EPA has said that long-term exposure to diesel particulate exhaust is likely to pose a lung cancer hazard.¹⁰ EPA has listed diesel particulate matter as a hazardous air pollutant.¹¹ The landmark Multiple Air Toxics Exposure Study conducted for the South Coast Air Quality Management District in California attributed 70 percent of all cancer risk from air toxics in that area to diesel particulates.¹² The national association of state and local air quality control officers conducted a screening-level health risk assessment of diesel emissions and concluded that diesel emissions may be responsible for 125,000 cancer cases (over a 70-year lifetime) in the United States.¹³

Exposure to diesel particulates has non-cancer and acute effects as well, including throat and eye irritation and inflammation, exacerbation of existing respiratory and allergic conditions, and exacerbated risk of heart attacks. Studies indicate children living near highways have more lung and breathing problems than other children.¹⁴ Children may also be exposed to more diesel exhaust inside diesel school buses, especially in idling buses that queue.¹⁵ People commuting to work in almost any mode of transportation along truck routes are exposed to high levels of diesel fine particulate matter.¹⁶

EPA has used the compelling evidence of adverse health effects from diesel particulate matter to embark on a comprehensive program of reducing exhaust from new vehicles and equipment (heavy-duty highway vehicles and heavy-duty off-road vehicles, with locomotive and commercial marine vessel regulations in development) by setting stringent emission and fuel standards. EPA has also encouraged and funded voluntary programs for diesel fleet owners to purchase equipment to retrofit the hundreds of thousands of diesel vehicles on the road.¹⁷

C. Ground-Level Ozone

Ozone is not emitted directly to the atmosphere, but is formed by a photochemical reaction between volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) in the presence of sunlight. Heavy-duty vehicles contributed about 25 percent to all NO_x emissions in Pennsylvania in 2002. (Diesel vehicles compared to gasoline-powered vehicles are not a significant source of VOCs.) Repeated exposure to ozone pollution may cause a variety of adverse health effects for healthy people and those with existing conditions, including difficulty in breathing, chest pains, coughing, nausea, throat irritation, and congestion. It can exacerbate bronchitis, heart disease, emphysema, and asthma, and reduce lung capacity. Ozone can aggravate asthma, causing more

asthma attacks, increased use of medication, more medical treatment and more frequent visits to hospital emergency clinics. Ozone also has adverse effects on vegetation (forests and food crops) and, through deposition, contributes to pollution in the Chesapeake Bay.¹⁸

The current ozone standard is set at 0.08 parts per million averaged over eight hours.¹⁹ In 2004, EPA designated 37 counties in Pennsylvania as not meeting the NAAQS for ozone. With the exception of the Philadelphia Interstate Area, all of these areas are currently monitoring attainment with the eight-hour ozone NAAQS due to implementation of state and federal programs. However, EPA is in the process of assessing the protectiveness of the current standard.²⁰

The major sources of NO_x in Pennsylvania, based on 2002 information, are electricity generation, gasoline highway vehicles and diesel highway vehicles. Highway vehicles in general, and diesel vehicles specifically, are significant sources of NO_x in Pennsylvania. The proportion of NO_x attributable to idling is discussed further in this report. As stated above, EPA believes that long-duration truck idling emissions account for no more than 3.4 percent of the total Class 8 truck emissions as estimated by MOBILE.

D. Other Effects

EPA estimates that idling heavy-duty vehicles can consume about one gallon of diesel fuel for every hour of idling time, adding more than a pound of carbon dioxide (CO₂), the major greenhouse gas (GHG). The idling of a typical long-haul truck contributes about 19 metric tons of CO₂ annually.²¹ Because the United States increasingly relies on imports for transportation fuel, unnecessary idling contributes to our energy dependence.

IV. LEGAL AUTHORITY TO ADOPT AN ANTI-IDLING REGULATION

The Department's legal authority to adopt anti-idling regulations is found in section 5 of the Air Pollution Control Act (APCA), 35 P.S. §4005, which in subsection (a)(1) grants the Board the authority to adopt regulations for the prevention, control, reduction and abatement of air pollution; in subsection (a)(7) grants the Board the authority to adopt regulations designed to reduce emissions from motor vehicles; and in subsection (a)(8) grants the Board the authority to adopt regulations to implement the CAA.

The regulatory measures recommended in the petition are designed to reduce emissions of PM_{2.5}, which is a regulated pollutant, by limiting the idling time of commercial diesel vehicles. The petition discusses both the problems of PM_{2.5} nonattainment areas and localized areas with possible elevated concentrations of PM_{2.5} from diesel emissions, as well as emissions of toxic air contaminants and oxides of nitrogen, contributing to the formation of particulate matter and ground-level ozone. An anti-idling regulation would help the Commonwealth address local concentrations of PM_{2.5} and make progress toward attainment of the PM_{2.5} and ozone standards. Consequently, the APCA provides sufficient authority for the Department to adopt an anti-idling regulation. Because an anti-idling regulation would help the Commonwealth achieve and

maintain the PM_{2.5} and ozone NAAQS, the regulation would be reasonably necessary to achieve and maintain the ambient air quality standards. Consequently, the restriction on the adoption of regulations more stringent than federal requirements should not prevent adoption of the regulation. 35 P.S. §4004.2.

V. BACKGROUND INFORMATION ON DIESEL VEHICLE IDLING

A. Long-Haul Truck Idling Related to Travel Rest

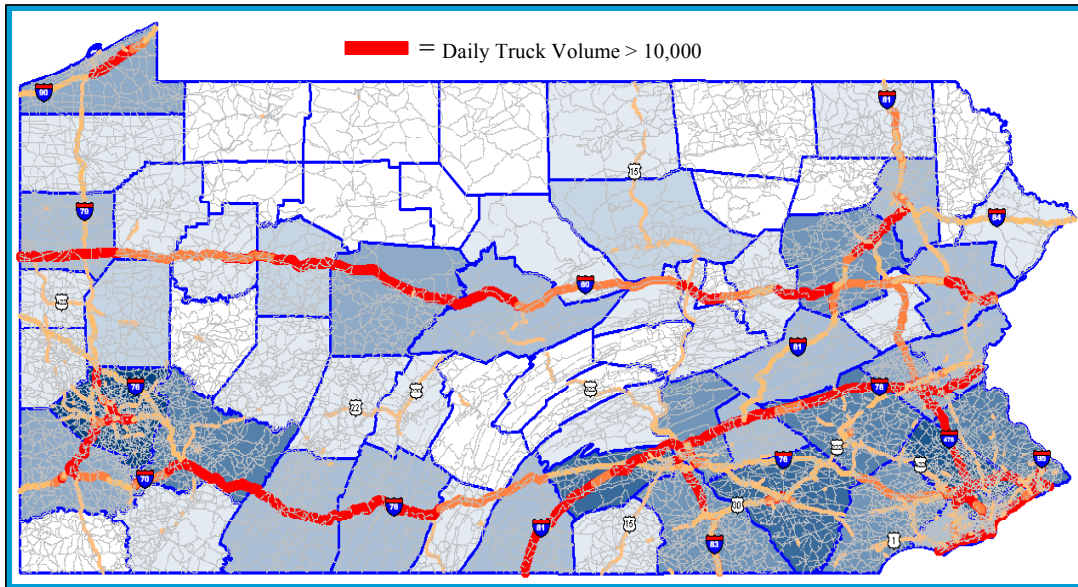
The United States Department of Transportation's (U.S. DOT) hours of service regulations require truck drivers to rest at least ten hours each day.²² Commercial motor vehicle drivers using a sleeper berth must rest at least eight consecutive hours in the sleeper berth, plus two consecutive hours either in the sleeper berth, off duty, or in any combination of the two.

During their rest periods, some drivers may run their engines to operate heat and air conditioning or to avoid opening windows for their own personal security, or to run auxiliary equipment for comfort (microwaves, TV) or to keep the engines warm in extreme temperatures. Habit also may play a significant part. Drivers may rest roadside or at truck stops, rest stops, motels, or street locations near their loading or unloading points.

The Department asked the Commonwealth's highway emissions consultant, Michael Baker Jr., Inc. (Baker) to quantify the idling occurring in Pennsylvania and the emissions of VOC, carbon monoxide (CO), NO_x and PM_{2.5} produced in Pennsylvania by that idling. Baker's full study, *Quantification of Pennsylvania Heavy-Duty Diesel Vehicle Idling and Emissions*, is available upon request to the Bureau of Air Quality. Quantitative information in Sections IV and V of this report is drawn from that study; references to studies Baker used that are cited in the Department's study can be found in their report.

There are approximately 250,000 Class 7 (26,001-33,000 lbs. GVWR) and Class 8 (33,001 lbs. or more GVWR) trucks that travel long distances (more than 500 miles) across the country. More than 42 percent of the national heavy-duty vehicle fleet consists of Class 8 trucks, and nearly all of those vehicles are powered by diesel fuel. Pennsylvania's major routes experience significant heavy-truck travel throughout the state, particularly the east-west routes. As expected, the primary interstates (specifically I-81, I-80, I-78, and the Pennsylvania Turnpike) carry the most truck volume.

Roadways with High Truck Traffic



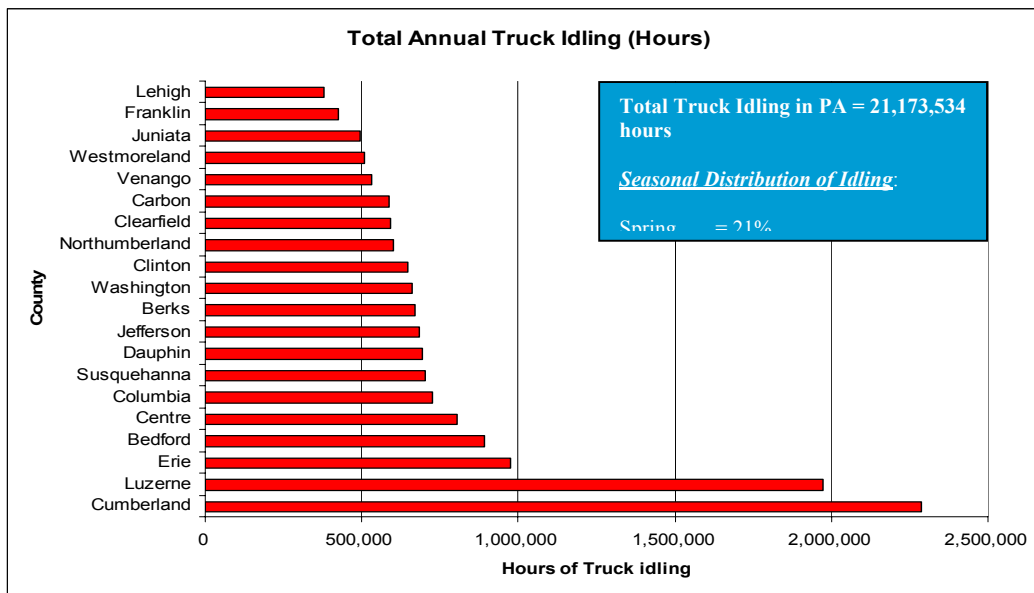
Based on Pennsylvania Department of Transportation Roadway Management System traffic data

Pennsylvania has approximately 260 truck stops and 47 public rest areas. There are over 13,000 truck parking spaces in Pennsylvania where significant long duration idling may occur. Cumberland, Luzerne, Erie, Bedford, Centre, Susquehanna, and Berks Counties together contain more than 41 percent of the Commonwealth's truck parking spaces. Cumberland and Luzerne counties each have over 1,300 truck parking spaces, which is more than twice the number in any other county. Nearly all of the major truck rest plazas are adjacent to the Interstate highways.

The Baker study used results from a 2003 University of California survey to estimate current idling durations and their variance with season and route. Idling times are higher during the summer and winter months due to the increased requirements for heating and air conditioning. Updated data was not available. The report may underestimate idling durations since the U.S. DOT revised the hours of service regulations in August 2005, extending the required rest periods.

The Baker study estimated total statewide idling related to truck travel rest to be more than 21 million annual hours. The idling activity for the highest 20 counties is provided in the following chart.

Estimates of Annual Truck Travel Rest Idling For Highest 20 Counties



Assumes long-duration idling is idling over 15 minutes and truck stops are open 365 days/year. Activity was calculated by multiplying the number of truck spaces times the supply/demand ratio and a seasonal factor. See discussion of Baker Exhibit 8.

Technology exists to assist drivers in reducing idling during their rest periods. On-board bunk heaters, cab heaters and auxiliary power units and generator sets can provide climate control, power and air conditioning. Equipment is also available that starts and stops the engine based on temperature, but this may be disruptive to rest. Costs per truck range from less than \$1,000 for a bunk heater to as much as \$10,000 for an auxiliary power unit capable of supplying cabin heat and air conditioning, engine warming and household power. Electrified parking space technology includes stand-alone services, which require minimal equipment for the truck, or technology requiring an interface on the truck to enable connection.

Since idling Class 8 trucks consume approximately one gallon of diesel fuel per hour, on average, idling reduction technology has a payback period between 12 and 24 months depending on technology, the price of diesel fuel, and the amount of time a vehicle spends idling.²³ Electrified parking spaces cost less to use than idling and also include other trucker amenities, such as an Internet connection. Idling reduction can save on maintenance costs because operating a diesel engine at the low idle speeds may increase wear and tear.

Despite these financial benefits, truck owners might not choose to install idling reduction technology due to concerns such as auxiliary equipment maintenance and service network availability, additional weight, and up-front costs of investing in the equipment. Larger companies (by far carrying the bulk of the freight tonnage) are more likely to avail themselves of anti-idling equipment than smaller companies or single owners or operators. Companies with single owners and operators comprise by far the largest number of companies.

The Department provides financial assistance in the form of loans and grants to small businesses for energy efficiency and pollution prevention measures, for which on-truck idling reduction equipment is eligible. The demand for the grant program consistently exceeds availability of funds. The loan program has not been used by trucking firms to date.

The Department has also granted \$1 million to IdleAire Technologies, Inc., to assist in the construction of about 300 electrified parking spaces at four truck stops; the total project cost was \$3.8 million. The company has now added electrified parking spaces to five additional private truck stops in Pennsylvania. Utilization rates are not yet at target levels, but the facilities have been open less than a year; the first one opened in August 2006.

The petitioner's suggested regulatory language recognizes both the need for truckers' comfort during rest periods (by including temperature exemptions) and the availability of technology to substitute for this idling (by sunseting the temperature exemption after April 2010).

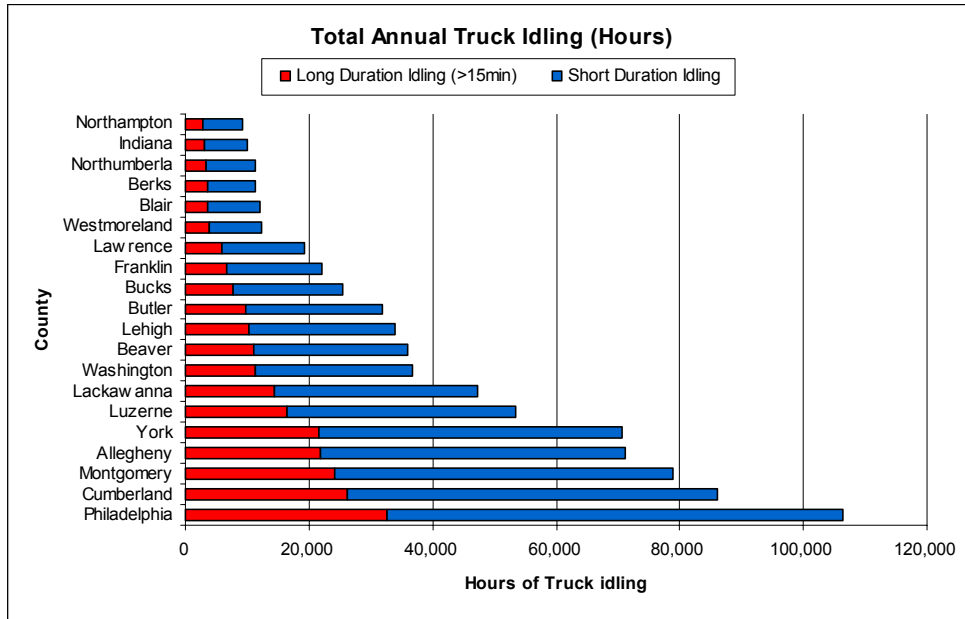
B. Other Truck Idling

Long-haul trucks also often idle when queuing to load or unload. In addition to idling reduction equipment, management practices at loading and unloading facilities can reduce idling. Electrified parking space technology can also be used but may not be as cost-effective in these situations.

Forty-one of 67 Pennsylvania counties have warehouse/intermodal (rail/marine/truck) facilities available (300 facilities in 2006). Philadelphia has the greatest number of facilities and more square feet of storage space. Cumberland County has the second largest amount of storage space.

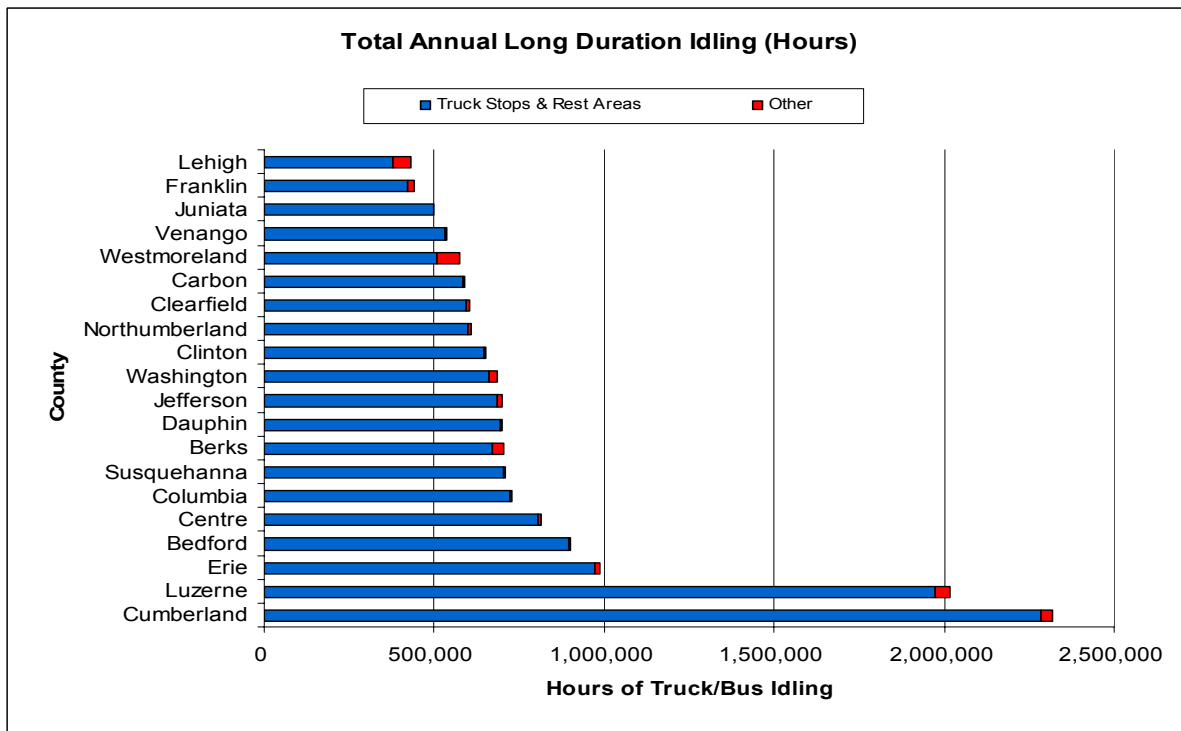
Data about truck idling at warehouses and intermodal (rail/truck) facilities is difficult to obtain and quantify. Baker correlated number of truck trips generated per 1,000 square feet of storage space and based average idling times at these facilities on an ITE Journal article on truck trip generation characteristics. The estimate of emissions assumed that 8 percent of the trucks at warehouse and intermodal terminals idle for periods greater than 15 minutes. More than half of the idling at these facilities was less than five minutes, which would be permitted by the petitioner's proposed restriction.

Annual Truck Warehouse/Intermodal Terminal Idling For Highest 20 Counties



Assumes idling activity distribution assumptions from Texas 2004 study and that facilities are open 250 days per year. 2005 PennDOT truck traffic distributions were used to estimate seasonal idling. See discussion of Baker exhibit 11.

Summary of Counties with the Estimated Highest Long Duration Idling

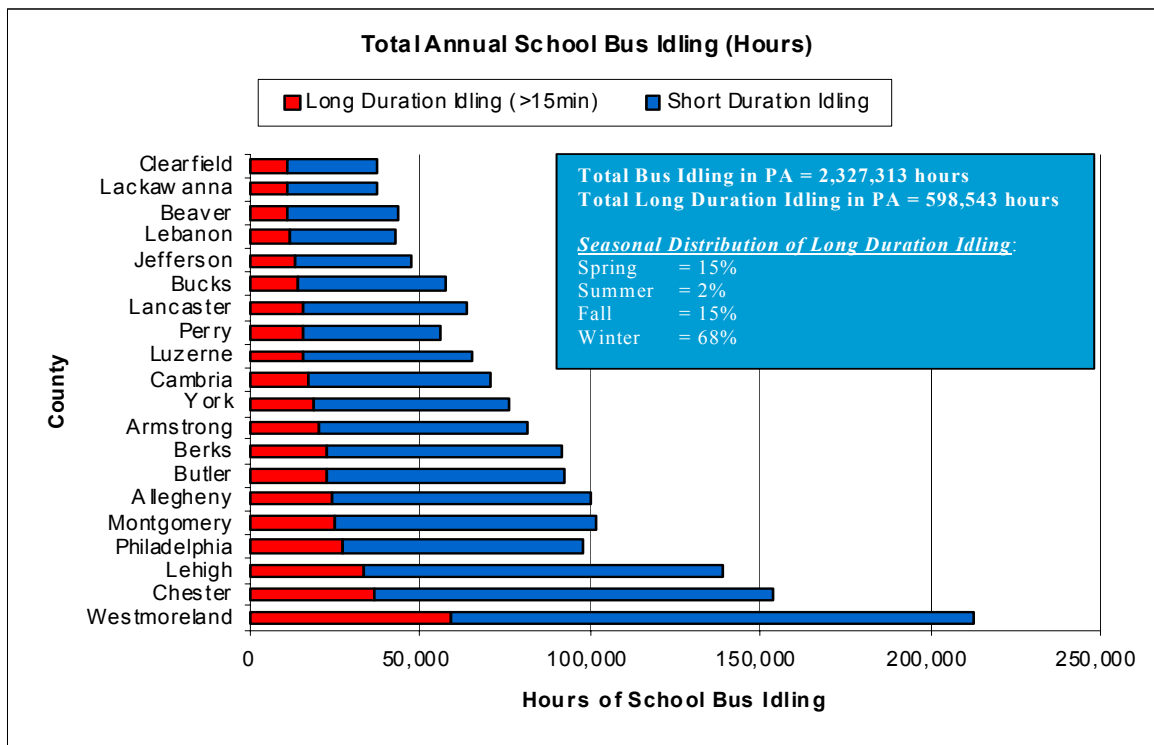


C. School Bus Idling

Most school bus idling is done to improve passenger comfort. Auxiliary equipment to heat or cool a bus is generally not available or cost-effective because of the size of the passenger compartment. However, with today’s vehicles, manufacturers advise that it is usually not necessary to idle more than a short time to warm the engine or passenger compartment.

A review of the *School Bus Fleet Magazine Forum* cited in the Baker study included comments from school bus drivers indicating that school buses were idled on average for about 20 minutes during the winter and 10 minutes for other seasons for engine start up. The non-route idling at school relates to school bus engine operation before or after children board or exit the bus. This typically occurs as school bus drivers warm the bus engines or wait for the start of the bus route (e.g. if they have arrived early to school). Because the engines are warm when buses arrive at schools, most should not require the long startup again if drivers shut them off while waiting for students. School buses may also spend as much as 20-30 percent of their time on bus route idling (picking up and dropping off) but generally not for more than five minutes at a time.

Estimates of Annual School Bus Idling for 20 Highest Counties



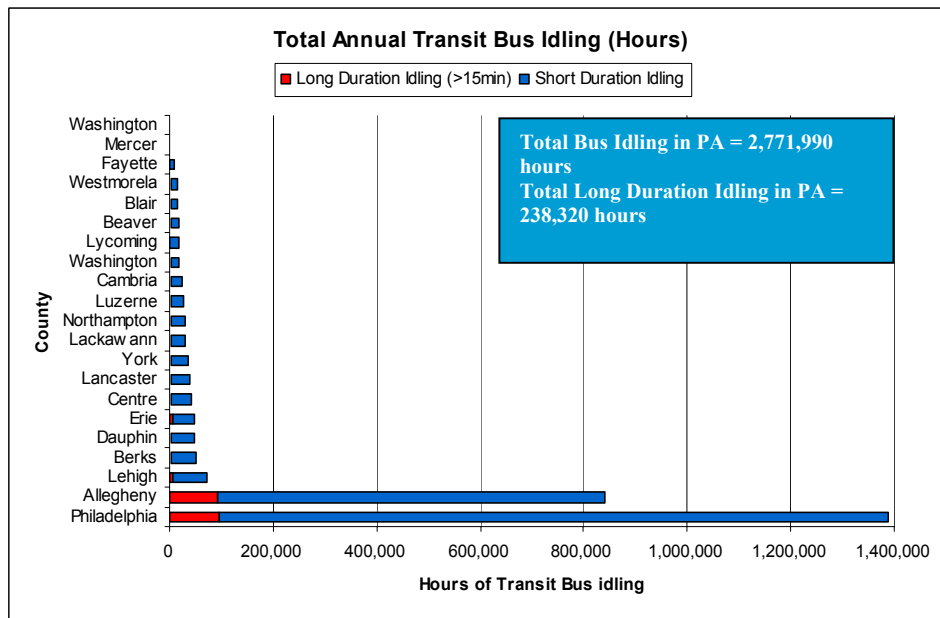
Assumptions: each bus generates two trips per day and 30 percent of buses idle for 15 minutes per trip for non-route idling. Seasonal distributions were applied. See discussion of Baker Exhibit 23.

D. Transit and Tour Bus Idling

Transit and tour buses may idle to warm the engine or wait at the transit facility (non-route idling), particularly during fall and winter. Based on information from EPA, diesel bus engines require about 5 minutes to warm up, and longer durations of idling are needed for air conditioning and heating. A study conducted by the Tompkins Consolidated Area Transit agency in Ithaca, New York indicated that 74 percent of the intercity buses idled for less than 10 minutes and 26 percent idled for 11-20 minutes.

The counties with the most significant long duration idling are Philadelphia and Allegheny, which have large transit bus fleets.

Estimates of Annual Transit Bus Idling For Counties with Transit Service

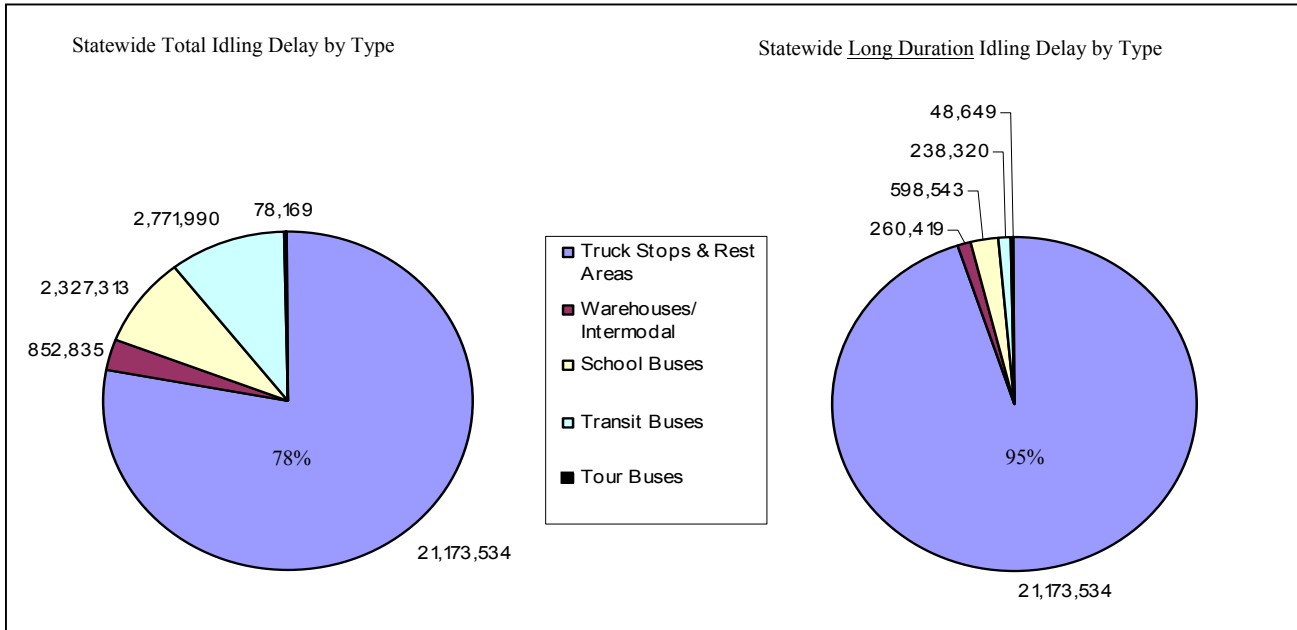


Estimates draw on information from California to estimate percentage of time transit buses spent idling in route and non-route operations. Annual operation hours for each transit agency were factored by 2005 PennDOT seasonal traffic distributions. See discussion of Baker Exhibit 26.

E. Summary of Idling Activity

The estimate of total heavy-duty idling is approximately 27.2 million annual hours. The idling due to truck travel rest at truck stops and rest areas accounts for nearly 78 percent of the total. Long duration idling (trucks idling for more than 15 minutes) has been calculated to be 22.3 million annual hours statewide, 95 percent of which has been estimated to be due to truck travel rest.

Summary of Statewide Estimate of Annual Idling by Type



VI. EMISSIONS QUANTIFICATION

A. Idle Emission Rates

Significant decreases in pollution from commercial diesel vehicles have occurred and will continue to occur as cleaner new diesel engines comprise more of the fleet. More stringent PM_{2.5}, NO_x and VOC standards were required for most 2002 and all 2004 model year engines. Engines made for model years (MY) 2007 through 2009 will reduce particulate matter by as much as 90 percent. Owners of post-2007 diesel engines will have another incentive to reduce long-duration idling – the potential for plugging of their expensive particulate filters. Engines made for MY 2010 and later will reduce NO_x by as much as 90 percent. Because of the significant increases in cost for the advanced technology engines and concerns about reliability, many diesel fleet operators bought MY 2006 vehicles to postpone purchase of the new technology engines. As a result, the rate of turnover during these technology transition years may be lower than historical trends. Because this has not been quantified, this factor has not been included in the emissions estimates.

The Baker study uses assumptions about emission rates for diesel vehicles from EPA guidance and, where appropriate, from the EPA MOBILE 6.2 model. However, there are a number of uncertainty factors and possible variability including engine speeds, accessory loads and temperatures.

The impact of future technology on NO_x emissions during long duration idling is also uncertain. Some technology intended to control running emissions may be less effective at idle. Therefore, NO_x emissions from idling vehicles are assumed by EPA idling emission credit guidance not to diminish for newer vehicles even though total emission rates decrease. There is also some uncertainty about future PM_{2.5} emissions, but since control strategies are based on filters and

traps, these are more likely to show increased effectiveness and the reduction estimates will be more predictable. In addition, on some truck engines, those sold in Pennsylvania and other states that adopted the requirements of the California Air Resources Board for new engines, starting with model year 2008, controls for start/stop devices (shutting the engine down after five minutes of idling) are required.

Therefore, emissions attributable to idling will decrease over time as fleets retire older technology vehicles and replace them with newer technology (post-2007 for PM_{2.5} and post-2010 for NO_x). However, the number of commercial diesel vehicles on the road is expected to increase significantly. The Baker study was not able to quantify increases in idling hours in future years, but did provide projections based on the number of idling hours in 2005.

B. Emissions From Idling

Baker estimated that the total 2005 NO_x truck idling emissions are approximately 1.2 percent of the total statewide mobile emissions. This percentage equates to nearly 4.2 million vehicle miles traveled. This will be higher for counties that have a large proportion of the idling emissions. As an example, for Cumberland County, Baker estimated that, EPA’s 3.4 percent limit aside, the NO_x idle emissions represent nearly 4 percent of the county’s highway vehicle NO_x emissions.

The tables below estimate the Class 8 truck idling emissions by two different methodologies. The “statewide inventory” estimates assume that these emissions are 3.4% of all Class 8 truck emissions, with that percentage limiting emissions in some counties. The “study calculation” estimates idling emissions based on hours of idling assumed in these areas and does not include transit, school, and tour bus idling emissions. The differences between the study results and those from the inventory vary by pollutant. The inventory estimates slightly lower statewide Class 8 truck idling emissions for the VOC, CO, and PM_{2.5} pollutants.

Statewide Inventory Projections of Class 8 Long-Duration Idle Emissions for 2005
(Results Provided for Sample of Counties and Statewide Total)

County	Statewide Inventory Estimates of Class 8 Truck Long Duration Idling Emissions (ton/year)					Study Calculations of Class 8 Truck Long Duration Idling Emissions (ton/year)*				
	VOC	CO	NOx	PM _{2.5}	CO ₂	VOC	CO	NOx	PM _{2.5}	CO ₂
Cumberland	3	23	136	2	6,956	12	102	344	9	10,370
Luzerne	3	20	111	2	5,602	10	88	296	8	8,926
Erie	2	17	87	2	7,351	5	43	145	4	4,370
Bedford	2	13	76	1	1,985	5	39	133	4	4,010
Centre	2	13	70	1	5,933	4	35	120	3	3,604
Columbia	1	5	30	1	2,409	4	32	108	3	3,251
Susquehanna	1	7	36	1	2,923	4	31	105	3	3,154
Dauphin	3	19	97	2	5,639	4	31	103	3	3,115
Jefferson	1	7	41	1	3,255	3	30	102	3	3,073
Berks	3	20	109	2	5,656	3	30	101	3	3,031
Statewide Total	94	651	3,207	65	209,606	108	944	3,189	87	96,137

VII. ANTI-IDLING REGULATION IN OTHER JURISDICTIONS

The federal government does not regulate commercial highway diesel vehicle idling, and generally considers the regulation of these vehicles in use to be the prerogative of state government.²⁴ In March 2006, recognizing that reducing unnecessary diesel vehicle idling would be a public health benefit and that a multiplicity of state and local rules was a “barrier to greater implementation of idling control technologies,” EPA released a model state idling law.²⁵ The model was a result of five workshops across the country in which affected stakeholders participated. EPA has advised that there are jurisdictions considering amending existing rules to be more consistent with the model and jurisdictions with no idling restrictions considering adopting the model. EPA is also providing financial assistance to the National Conference of State Legislators to educate legislators on the benefits of reduced diesel idling and the model law.²⁶

The model law is similar in intent and structure to the rule suggested by the petitioner but differs in some of its specifics. In particular, the EPA model dispenses with specific temperature exemptions in favor of a blanket (but potentially transitional) exemption for sleeper berths. Both rules embrace the concept of advance warning for expiration of such an exemption to encourage fleets to invest in idling reduction technology or use electrified parking spaces. The EPA rule makes specific provisions for the responsibility of operators of loading and unloading facilities, while the petitioner’s language is more general. The rule suggested by the petitioner includes language to hold facility operators responsible for idling on their property, which is identical to a provision in New Jersey’s law.

Appendix B compares the petition’s suggested regulation, regulations adopted by Philadelphia and Allegheny counties, and EPA’s model law.

Idling restrictions have been adopted by 14 states,²⁷ the District of Columbia and many local jurisdictions, including Pennsylvania’s two most populated urban areas, Philadelphia and Allegheny counties. Many of these rules either exempt idling for purposes of driver rest in a sleeper berth truck or contain temperature exemptions to accommodate this need. A compilation of state, county and local anti-idling regulations is available from EPA²⁸ and other sources. The “cab card” compiled by American Transportation Research Institute (ATRI) appears to be succinct and up to date and is provided in Appendix C.

VIII. ENFORCEMENT OF IDLING RESTRICTIONS

States and localities face challenges in the enforcement of idling restrictions. The Department's inspectors are currently not routinely present at most locations and times at which commercial diesel vehicle idling tends to occur. Many states with idling restrictions enable local and/or state law enforcement agencies to enforce the restrictions. Therefore, the Department has included in this study examination of the Commonwealth's enforcement authorities and the practices of other states with idling restrictions

A. Legal Considerations for Enforcement

If a regulation was adopted, DEP inspectors would be authorized to issue summary citations under the APCA for violations of an anti-idling regulation. Section 9 of the APCA makes violation of a regulation adopted under the APCA a summary offense, punishable by a fine of not less than \$100 nor more than \$2,500 for each separate offense. 35 P.S. §4009(a). Section 4 of the APCA authorizes Department employees to institute prosecutions under the act. 35 P.S. §4004(12). The Department would also be authorized to issue enforcement orders and assess civil penalties under sections 4 and 9.1 of the APCA. 35 P.S. §§ 4004(9) and 4009.1. Enforcement orders would be more appropriately issued against facilities than drivers. Moneys collected from fines or civil penalties are paid into the Clean Air Fund, established by the APCA, which is used for the elimination of air pollution. 35 P.S. §4009.2.

Because Section 9 makes violation of a regulation adopted under the APCA a summary offense, the Pennsylvania State Police (PSP), Municipal Police Officers within their jurisdiction, and County Sheriffs also have enforcement authority. However, the PSP, Municipal Police Officers and Sheriffs may not enforce on private property from which the public is excluded, such as a warehouse or a gated terminal yard, without a warrant. The PSP, Municipal Police Officers, and Sheriffs could enforce at truck stops and highway rest stops that are generally not considered private property for these purposes. The Department was advised by officials of the PSP that, because of other priorities, the PSP would not be able to devote significant resources to enforcing an anti-idling regulation. Also, the fact that money collected from fines would be deposited in the Clean Air Fund removes a financial incentive for Municipal Police and Sheriffs to enforce a statewide anti-idling regulation.

Moreover, under Kopko v. Miller, 586 Pa. 170, 892 A.2d 766 (2006), the Sheriff and deputies would be limited to issuing citations and would be unable to arrest unless the violation constituted a breach of peace committed in their presence.

Regardless of who enforces, enforcement could be made by direct observation by the police officer or DEP inspector or by information received through a citizen complaint. Any evidence given in court to prove the basis for a summary citation filed on information received from a citizen would be presented by the citizen, not by the police officer or inspector who filed the citation, although the presence of the latter would be required.

B. Enforcement Experiences in Other States

Regulation in adjacent states.²⁹ No two idling regulations are the same and all have different levels of effectiveness. Ohio and West Virginia do not have idling restriction regulations or immediate plans to adopt them. Maryland and Delaware recently adopted idling restriction regulations. However, no enforcement action is known to have taken place in Maryland. Delaware has issued only ten tickets in the six months since its regulation has been in effect. After discussion with the states that do have and enforce a regulation, the Department believes that the amount of time devoted to a program determines whether compliance improves.

All of the environmental agencies interviewed that have idling restrictions, except Maryland, have ensured that all law enforcement agencies within their jurisdiction can enforce their regulation. In Maryland, legislation gives authority to enforce only to the Maryland State Police and the Maryland Transportation Authority. In all instances, the cooperation between the law enforcement agency and the environmental agency in coordinating enforcement actions is virtually non-existent. Therefore, it is difficult to determine to what level state or municipal police are enforcing idling restriction, but the general belief among state environmental agencies is that very little enforcement is occurring outside the environmental agency.

A statewide anti-idling regulation would allow inspectors and law enforcement officers to respond to citizen complaints about excessive diesel idling by the most egregious offenders. Other states have followed such a complaint-based approach and have penalized drivers and/or property owners. This approach has limited results for reducing overall idling by modifying behavior. In many cases, state environmental agency staff believes that local law enforcement does not even know the law exists. The one exception may be the District of Columbia where in hot weather, emissions from tour buses can become overwhelming in certain areas of the city. Also, the District of Columbia regulation is used as a homeland security measure to examine parked trucks and buses around federal buildings.

Successful strategies. Involving property owners in enforcement and outreach where idling occurs is an important step for reducing long-term idling. This type of program goes beyond just enforcement against individual operators to education and outreach of the industry. High idling areas are visited for enforcement multiple times until the word spreads that unnecessary idling is being targeted. The implementing agency works with property owners and truck drivers to develop solutions to reduce idling at those sites. Trucks come and go, and the chance of enforcement against a single operator is limited. Many trucks will idle at warehouses, travel centers, or other businesses and never get a ticket. These drivers may never feel the need to curtail their idling, especially if the customary warning is given for the first offense. In New Jersey and New York, the property owner of the business where the idling occurs is usually cited too, but they can have the penalty reduced or eliminated by displaying “No Idling” signs on their property and by taking a more active role in promoting idling reduction. In many jurisdictions, posting signs on private property has proven to be an effective way for increasing compliance.

States have found that property owners are a point of significant leverage in modifying the behavior of truck operators. The District of Columbia does not cite businesses for allowing

idling on their property, but nevertheless enforces at certain problem locations to such an extent that property owners have gone out of their way to offer solutions.

Most state agencies give warnings or partial fines to first-time offenders even if a warning provision is not specified in a regulation. In the District of Columbia, a reduced penalty is allowed if the violating operator agrees to spread the word about the District of Columbia anti-idling regulation to other drivers in the company either on the truck company's communication system or by way of a flyer in each driver's paycheck.

In states and cities that have proactive programs, most of one full-time position is required to coordinate the enforcement effort. Inspectors are also needed to visit known places of idling. In these cities, three to four inspectors devote several hours a week during moderate temperature seasons. In state jurisdictions, 10 to 15 inspectors spend several hours every month enforcing the regulation in specific problem areas.

Some idling may be difficult to detect. Individual trucks idle at lumberyards, cement plants, quarries, construction sites, and small businesses every morning could possibly make up most of the idling emissions in Pennsylvania. No existing program attempts to quantify emissions or enforce at these locations.

IX. CONCLUSIONS AND RECOMMENDATIONS

- While most exposure to diesel emissions occurs from moving vehicles, emissions associated with long-duration truck travel rest idling increase exposure to air pollution in many communities across Pennsylvania. This exposure varies significantly by geographical location. Diesel emissions from idling vehicles also contribute to nonattainment for PM_{2.5} and ozone in many areas. A statewide idling restriction such as that suggested by the petitioner would eliminate some of those emissions.
- DEP is authorized by law to adopt and enforce a statewide anti-idling regulation. Other state and local agencies would also be able to enforce a DEP regulation, though the likelihood of their enforcement may be low.
- Because reducing unnecessary idling also reduces diesel fuel use, a statewide anti-idling regulation could also increase energy independence and reduce Pennsylvania's contribution to GHG emissions.
- Although the greatest amount of long-duration travel rest-related idling occurs in a few counties in Pennsylvania, the state and national trucking industry has indicated a preference for consistency over patchwork local regulation.
- While a statewide idling regulation faces enforcement challenges, targeted education campaigns in selected areas, similar to those in Massachusetts and New Jersey, would be most effective in reducing idling emissions. A proactive program that enforces a

statewide regulation requires considerably more effort and is likely to eliminate more hours of idling. The key elements in proactive programs are a focus on concentrated areas of idling where enforcement sweeps are performed and the involvement of the property owner where the idling occurs. Property owners can raise awareness of the issue and, in some cases, alternatives to idling can be developed.

- The Department recommends that the EQB direct the development of a statewide idling rule. The petitioner's suggested language is a good start; however, the EPA model rule should also be considered to facilitate national consistency. Because most emissions from idling can be attributed to travel rest during hot and cold weather and because technology is available and affordable to reduce such idling, idling restrictions should provide a date certain by which temperature-based exemptions for travel rest idling would no longer be available. This concept was included in the petitioner's suggested language and the EPA model rule.

ENDNOTES

- ¹ *What You Should Know About Diesel Exhaust and School Bus Idling*, EPA, June 2003.
- ² EPA presentation at regional idling workshops in 2004 posted at www.epa.gov/SmartwayLogistics/presentations/background.pdf
- ³ Discussion of health effects of particulate matter can be found in the Staff Papers and the Air Quality Criteria documents developed during EPA's review of the NAAQS. See www.epa.gov/air/particlepollution/standards.html to access all of these documents.
- ⁴ 62 FR 38652, July 18, 1997
- ⁵ Implementation was delayed a number of years due to litigation.
- ⁶ 71 FR 61144, October 17, 2006
- ⁷ Regulations for transportation conformity require local PM_{2.5} analysis (71 Fed. Reg. 12468 (Mar. 10, 2006)) for some highway projects affecting diesel vehicles although quantitative techniques for the analysis have not yet been developed.
- ⁸ *Guidance for Quantifying and Using Long Duration Truck Idling Emission Reductions in State Implementation Plans and Transportation Conformity*, EPA, January 2004
- ⁹ *Health Assessment Document for Diesel Engine Exhaust*. U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment, Washington Office, Washington, DC, EPA/600/8-90/057F, 2002.
- ¹⁰ *Ibid.*
- ¹¹ 66 Fed. Reg. 17229 (Mar. 29, 2001)
- ¹² *Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES-II)*, March 2000. www.aqmd.gov/matesiidf/matestoc.htm
- ¹³ *Cancer Risk from Diesel Particulate: National and Metropolitan Area Estimates for the United States*, State and Territorial Air Pollution Program Administrators, March 2000. www.4cleanair.org/comments/Cancerriskreport.PDF
- ¹⁴ Childhood Asthma Linked to Freeway Pollution, University of Southern California, September 21, 2005 press release. The study did not specifically discuss diesel pollution.
- ¹⁵ Children's Exposure to Diesel Exhaust on School Buses, Environment and Human Health, Inc., February 2002. Subsequent information indicates exposure is strongly related to age of the bus.
- ¹⁶ *A Multi-City Investigation of Exposure to Diesel Exhaust in Multiple Commuting Modes*, Clean Air Task Force, Special Report 2007-1, February 28, 2007
- ¹⁷ National Clean Diesel Campaign at www.epa.gov/cleandiesel summarizes the reasons for and provides access to EPA's regulatory and voluntary efforts to reduce diesel emissions.
- ¹⁸ Information on the adverse effects of ground-level ozone can be found in the Staff Papers and the Air Quality Criteria documents developed during EPA's review of the NAAS. See [/www.epa.gov/ttn/naqs/standards/ozone/s_o3_index.html](http://www.epa.gov/ttn/naqs/standards/ozone/s_o3_index.html) to access all of these documents.
- ¹⁹ 62 FR 38652, July 18, 1997
- ²⁰ Review of the National Ambient Air Quality Standard for Ozone, Policy Assessment of Scientific and Technical Information, OAQPS Staff Paper, EPA 452/R-07-003
- ²¹ A Glance at Clean Freight Strategies, SmartWay Transport Partnership, USEPA, February 2004
- ²² 49 CFR part 395
- ²³ Economic Analysis of Commercial Idling Reduction Technologies, Argonne National Laboratories, Center for Transportation Research
- ²⁴ See Section 209(d) of the CAA.
- ²⁵ Publication #EPA420-S-06-001, April 2006
- ²⁶ Conversation and e-mail from Paul Bubbosh, USEPA Office of Transportation and Air Quality, to Arleen Shulman, Bureau of Air Quality, DEP, 2/7/2007
- ²⁷ Arizona, California, Delaware, District of Columbia, Illinois, Maryland, Massachusetts, Nevada, New Hampshire, New Jersey, New York, Rhode Island, Texas for certain counties, Utah (unattended vehicles), and Virginia
- ²⁸ Publication #EPA420-B-06-004, April 2006 While very complete until mid-2005, it has not been updated. Illinois and Delaware subsequently have adopted anti-idling laws.
- ²⁹ States interviewed included New Jersey, Massachusetts, New York, Maryland, Delaware, District of Columbia, Ohio and West Virginia.