

Overview of Efforts to Reduce Idling in the Ozone Transport Region

*Prepared by OTC
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Introduction

Reducing idling from the in-use fleet is an integral part of the Ozone Transport Region's (OTR) emissions reduction strategy. Oxides of nitrogen (NO_x) are an important precursor for ozone formation, especially in volatile organic compound (VOC)-saturated air sheds. When the inventory of NO_x emissions in the OTR is examined, mobile sources are one of the most important sectors of emissions in OTR's NO_x inventory, with heavy-duty vehicles, buses, nonroad equipment, and rail being the important subsectors. The Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have both undertaken programs that reduce NO_x emissions from new diesel vehicles and equipment by lowering emission standards for new engines. However, fleet turnover results in a time lag before these standards have a large impact. With heavy-duty trucks often remaining in the fleet longer than passenger vehicles, and nonroad equipment often even longer, this time lag for cleaner vehicles and equipment can be quite problematic. Given a need for emission reductions in shorter timeframes to achieve public health improvements, emission reductions are needed from the in-use fleet and reducing idling is a way to reduce emissions from this source category.

The only physical way to reduce idling is to turn off the vehicle or equipment's engine. When the engine is not running, the engine is not producing harmful emissions such as NO_x, fine particulate matter (PM_{2.5}), air toxics, and carbon dioxide (CO₂). These pollutants, generated by the combustion of fuel, lead to health issues such as asthma, and other cardiopulmonary problems, cancer, and also contribute significantly to climate change. On the positive side, when the engine is not running, fuel is not being consumed, which saves the operator money.

With the promise of cost savings one would expect idling reduction to be commonplace. However, myths about the benefits of turning off the engine, the need to run temperature systems, or simply old habits result in idling. Some safety concerns need to be considered when determining idling is necessary, but unnecessary idling provides no benefit at a cost of fuel, money, and the public health.

The jurisdictions in the OTR have undertaken a variety of efforts to reduce idling (details in Appendix A and B). Primarily they have done this through anti-idling laws and regulations. Additionally, there are a variety of educational approaches that have been undertaken to raise awareness about unnecessary idling with owners and operators, as well as the public at large, and a variety of approaches have been taken to enforcing anti-idling regulations or reinforcing the behavior of operators that reduce idling. There are also funding sources available that can be used to expand anti-idling programs and provide technological alternatives to idling. This document examines some of the best practices in regulating, enforcing, and educating about unnecessary idling.

Education Practices

Education plays a vital role in reducing unnecessary idling because it informs:

- The public at large about the health effects of idling;
- Operators, enforcement officials, and parties with the ability to influence actors (e.g., school principals) about new restrictions and exemptions;
- Operators concerning the myths surrounding idling; and
- Owners and operators about the fuel and economics savings that come from reducing idling.

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Jurisdictions in the OTR have undertaken a variety of approaches, using new and old media, to educate all stakeholders concerning unnecessary idling, with a focus on operators since they are the ones that can actually turn the engines off.

Signage

Signage is an important reminder of anti-idling restrictions. Typical signage resembles signs that designate other rules such as parking restrictions. The signs are ideally placed in areas where idling often occurs (e.g., school entrances, rest areas, construction zones, truck stops). It is recommended that the signage include details of the restriction such as the time limit.



Pamphlets and Posters

Pamphlets and posters are types of materials that many jurisdictions in the OTR have developed. They have the benefits of having a low cost and being able to be placed at areas where primary stakeholders can be found (e.g., truck stops, schools, port entrances).



Idling "Ticket"

Idling restrictions, for the most part, are relatively recent so it is often a good idea to consider warnings that do not carry a financial penalty to both raise awareness about idling restrictions and not alienate stakeholders. Two states have taken this one step further. Connecticut and New Jersey have developed idling "tickets" with Connecticut's doubling as a brochure educating the recipient about idling restrictions and dangers. From February 2009 to October 2010, over 36,000 "tickets" were distributed to municipalities and state agencies including DMVs bus and cab companies, and other private companies. In addition air bureau staff distributed "tickets" to companies during their normal inspections. New Jersey often provided their tickets to schools to increase the awareness of school bus drivers about idling.

A yellow form titled 'THE CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION'. It contains fields for 'REGISTRATION', 'TICKET NO. A321012', 'VIOLATION DATE', 'TIME', 'LOCATION OF VIOLATION', 'EMPLOYEE', 'INSPECTOR NO.', and 'VEHICLE MAKE'. Below these fields is a section titled 'NOTICE OF IDLING VIOLATION' with a small paragraph of text. The main heading is '3-MINUTE LIMIT IT'S THE LAW'. At the bottom, there is a logo for the Connecticut Department of Energy & Environmental Protection and the text 'IDLING REDUCTION IS OUR GOAL IN CT' and 'DEEP Commissioner'.

A poster with a dark background and a white car silhouette. The text reads: 'Help Keep New Jersey Clean! IDLING INFRACTION Idling Stinks, and it's Against the Law! New Jersey has a three-minute idling law When you turn your engine off, you: Stop Pollution Save Money Save Lives This is not an actual ticket, but a friendly reminder that idling longer than three minutes is against the law. For more information, please check out our website at www.StopTheSoot.org'. On the right side, there is a white box with a blue globe icon and the text 'Idling Stinks! IDLING INFRACTION' followed by fields for 'Date / Time of Infraction', 'Location of Infraction', and 'License Plate #'. The Connecticut Department of Energy & Environmental Protection logo is in the top right corner.

Tollbooth Wraps

Not everyone who is subject to idling regulations lives in the jurisdiction with the regulations, which is especially true for long-haul truck drivers. Informing this group of operators might be particularly

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challenging given that they may be simply stopping. Pennsylvania has taken the approach of installing toll booth wraps, the booths being at the entrances of their major trucking routes, in order to reach these operators.

School Initiatives

A particularly vulnerable group of stakeholders with regard to pollution from unnecessary idling is school children. The majority of school children rely on buses to transport them to and from school every day. In the afternoon in particular, school buses often line up at the entrance to school, idling their engines while waiting for students to board. Educating students and their parents is important for reducing this form of idling, since it prompts students and parents to increase enforcement. Connecticut has tried one innovative approach to informing younger children about idling by producing a children's book called "Casey's Clean Air Week." New Jersey also has a pledge available to school districts to encourage schools to make commitments to reduce idling.



No Idling Pledge
for School Districts

We pledge to protect the health and well-being of the students and staff of our school district. We recognize that buses are the safest mode of student transportation, yet excessive school-bus emissions of soot from idling are a threat to children's health.

To protect students and staff from harmful soot, we voluntarily pledge:

- To turn off engines while waiting to load and to unload students
- To use newest buses for the longest routes
- To maintain buses to eliminate any visible exhaust
- To complete school-bus driver training on eliminating idling

School or School District: _____
Town: _____
School Administrator's Signature: _____
School Administrator's Name (Printed): _____
School Administrator's Title: _____
Signed on this date: _____

STATE OF NEW JERSEY
Department of Environmental Protection

Completed form should be sent to Bureau of Mobile Sources, NJDEP, 401 E. State Street, P.O. Box #20240, Trenton, NJ 08625, or faxed to (609) 433-3226

Truck Stop Initiatives

Truck drivers are another group that needs to be educated in order to reduce idling. Many of the aforementioned educational materials can be used to educate truckers and such materials must be placed in locations truck drivers frequent, such as rest stops, to achieve the maximum effect. Providing items, such as air fresheners that include anti-idling information that serve as a reminder about rules that truck drivers will need in their travels is another way to increase awareness.

Websites

The most common approach that relies on new media is a website, which allows many stakeholders easy access to information to learn more about idling and idling. It is important for the website to be mobile friendly since one would expect that operators in particular are going to have easier access to mobile devices while traveling than a conventional computer. Downloadable apps for phones running iOS and Android also provide an avenue to spread awareness.

- CT - http://www.ct.gov/deep/cwp/view.asp?a=2684&q=322086&deepNav_GID=1619
- MD, DC, VA - <http://www.turnyouengineoff.org/>
- MA - <http://www.mass.gov/eea/agencies/massdep/air/programs/school-bus-idling-reduction.html>
- NJ - <http://www.stopthesoot.org/>
- NY - <http://www.dec.ny.gov/chemical/8585.html>
- NH - <http://des.nh.gov/organization/divisions/air/tsb/tps/msp/irc/index.htm>

- PA - <http://www.dep.pa.gov/Business/Air/BAQ/Automobiles/Pages/DieselIdling.aspx#.VwUhcPPD-74>

Social Media

Websites are not the only way to use technology to increase awareness of unnecessary idling. Facebook, Twitter, Instagram, and YouTube all provide opportunities to reach out to different segments of the population. For instance, communities around schools often have Facebook groups and can be effective in communicating more directly with stakeholders that are affected by idling of school buses. Video clips and movies also add a more immersive opportunity to learn more about idling. An example of this is Connecticut's "Wastebusters" video that is an homage to the television program "Mythbusters" that examines several myths concerning idling¹.

Online Courses

Online courses are another tool that can be used to educate about idling. This could be particularly useful to help owners and operators understand the various exemptions and allowable behaviors within the idling restrictions of a specific jurisdiction. Vermont provides an example of using online courses to help educate operators about unnecessary idling through their "Vermont Idle-Free Fleets" program which they developed in conjunction with the American Lung Association.

DOE Clean Cities Idle Box Toolkit

The aforementioned tools do require resources to develop, which may be harder to obtain with constrained budgets. To get states started, the U.S. Department of Energy (DOE), through their Clean Cities program, offers a variety of templates for posters, signs etc., as well as idling saving calculators and databases of regulations on their Idle Box Toolkit website (<https://cleancities.energy.gov/technical-assistance/idlebox/>).

Enforcement Practices

Once stakeholders have been educated about idling, enforcement becomes the key to achieving emission reductions. In fact, enforcement is important to achieving reductions from almost any program, whether it is ensuring that the appropriate catalysts are on a vehicle, or if a can of paint has the allowed amounts of VOCs. But when it comes to idling, there are enforcement challenges that go beyond those faced by other environmental programs. Firstly, unnecessary idling occurs in the short term, so a vehicle that is unnecessarily idling could be running properly just a few minutes later. Secondly, since idling is allowed for certain time limits, demonstrating noncompliance involves a higher level of time investment for enforcement officials than other forms of noncompliance. As a result, anti-idling enforcement has more in common with enforcement of parking regulations than it does with typical environmental enforcement. Different strategies are therefore necessary in idling enforcement.

1

<http://u10videos.com/DEP/Air/WasteBustersFuelEfficiency.wmv?sami=http://u10videos.com/DEP/Air/WasteBustersFuelEfficiency.smi&name=Wastebusters>

Complaint Based Response

Enforcement of illegal idling often comes at the behest of citizen complaints. Investigations occur in response to reports from the public that vehicles are idling when they are not allowed to. This does prove challenging though since it requires the unnecessary idling to be consistent in time and place so that authorities can observe the illegal behavior. It is recommended that these complaints be tracked to help inform other enforcement activities (discussed later) allowing prompt follow up so that citizens know their concerns are being addressed.

Setting up online maps that the public can access to lodge their complaints can further help engage the public in enforcement. Although not specifically for idling, DC's Vision Zero map is a good example of such a complaint registration system (<http://visionzero.ddot.dc.gov/VisionZero/>). Citizens of the City of Philadelphia can go to the following website and click on an interactive map to submit a complaint about excess idling: <http://www.idlefreephilly.org/>.

Additionally, some jurisdictions have set up 311 phone apps. These apps allow a smart phone user to easily submit a complaint about idling behavior (among other things) that is geolocated. Some of these apps even permit other nearby people to "second" a complaint allowing for a fuller picture of the idling hotspots. Of course, one should remember that with these types of technologies, some disadvantaged communities may not have the same access and attention should also be paid to populations that are conspicuously absent from complaint systems.

Geographic and Temporal Targeting

Idling can occur nearly anywhere that vehicles and equipment move and at any time of day. There are however some ways to limit the scope of enforcement actions to times and places where enforcement officials are more likely to encounter enforceable actions.

Identifying geographic locations where idling occurs more often is one step. Schools, hospitals, truck stops, delivery centers, construction sites, tourist destinations, and ports are all locations where idling is more likely to occur. Many of these locations are frequented by sensitive populations such as children and the sick and hence deserving of additional scrutiny. The District of Columbia has even used Geographic Information System (GIS) software to improve their understanding of idling hotspots in order to focus idling enforcement.

The geographic understanding of where idling occurs, combined with an understanding of the times and days when certain types of idling occur enhance the likelihood of enforcement officials encountering enforceable actions. Some examples would be targeting schools near dismissal time, construction sites during lunch, truck stops in the evening, and ports during loading/unloading of ships. However, it is important to take safety considerations when choosing enforcement times (e.g. visit truck stops towards the beginning or end of typical rest periods so a trucker's sleep is not interrupted). Enforcement officials could travel from site to site throughout the day based on when idling is expected.

Although having geographic and temporal targets is important, it is vital that such enforcement actions are not too predictable. For instance, if a school knows that an enforcement official will show up on Wednesday afternoons, they will be more likely to stop idling only at that particular time. New Jersey has developed a plan for periodic enforcement sweeps to ensure compliance that can be useful for other states.

Positive Reinforcement

Positive reinforcement can also impact the level of compliance with idling regulations. Offering financial incentives for those found to be following idling regulations is one such approach. States could also follow the example of Maryland, which held an Idling Raffle Dinner at which operators complying with idling restrictions were entered into a raffle.

Enforcement Challenges

Enforcing idling regulations provides particular challenges that must be overcome in order to successfully reduce emissions. Like traffic violations, idling can occur anywhere in a very wide geographic scope and at any time. Furthermore, at least 3-5 minutes of observations are needed to establish or confirm illegal idling. The resources necessary to have robust enforcement that would act as a deterrent are rather large and thus need to be carefully examined.

Authorities are reluctant to enforce idling laws and regulations against trucks with out-of-state plates because tickets usually go unpaid. They are also reluctant to potentially disturb long-haul truckers for fear of interrupting federally mandated rest period.

Exemptions also pose a challenge to enforcement. Authorities can find the myriad of exemptions in many of the statutes/rules confusing and open to interpretation. As a result, restrictions may go unenforced. It is important that exemptions be limited and be made clear to ensure ease of application during enforcement for officials.

Railroads present an entirely different challenge in idling enforcement. Railroad companies maintain that state idling limits are pre-empted by federal law, so local authorities are reluctant to undertake difficult and contentious enforcement efforts. This issue is currently before the Surface Transportation Board, EPA, and the courts.

Anti-Idling Technologies

Education and enforcement do not offer the only approach to reducing idling. Several technologies are now available that either take the thought out of turning vehicles off without manual intervention (automated) or replace services such as heating/cooling and operating electronic devices, with lower impact on resources. The following section has a brief overview of some of these technologies²³⁴.

Automatic Engine Shut Down and Start Up/Electronic Engine Idling Parameters

Used in locomotives and to a lesser extent trucks, an automatic engine shut down/start up system controls the engine by stopping or starting it without operator action, based on a set time period or ambient temperature, and other parameters (e.g., battery charge). They are simpler to install and use, but can increase engine wear.

² <http://www3.epa.gov/smartway/forpartners/documents/trucks/techsheets-truck/420f09038.pdf>

³ <http://www.truckingefficiency.org/idle-reduction>

⁴ http://www.afdc.energy.gov/afdc/vehicles/idle_reduction_equipment.html

Auxiliary Power Units (APUs)/Generator Sets

These are small, diesel-powered engines (5-10 horsepower) used in any type of diesel vehicle or equipment which is large enough for a system to be installed that provides air conditioning, heat, and electrical power to run accessories such as lights, on-board equipment, and appliances. This solution is more comprehensive, but has higher upfront costs than some of the other solutions presented.

Coolant Heaters/Energy Recovery System

Used in onroad vehicles, coolant heaters use the regular heat-transfer system. The heater is mounted in the engine compartment, draws fuel from the fuel tank to heat the coolant, and then pumps the heated coolant through the engine, radiator, and heater box. Coolant heaters provide the additional benefit of keeping the engine warm, reducing the impact of cold starts. Energy recovery systems are similar but do not require a separate piece of equipment. A very small electric pump is connected to the vehicle's water line, which keeps the vehicle's cooling system and heater operating after the engine is turned off. Energy recovery systems typically do not provide enough warmth to be the sole source of overnight heat.

Diesel-Driven Heating System

Used in locomotives, this system is designed to heat the coolant and oil to allow main engine shutdown in cold temperatures, without using a generator to produce auxiliary power. Instead, it circulates and heats the engine coolant and oil to a target temperature of 120° F.

Fuel Operated Heaters

Used in onroad or nonroad vehicles, fuel operated heaters are small, lightweight heaters that burn diesel fuel from the main engine fuel supply or from a separate fuel reserve. They provide heat only, but can be used in conjunction with cooling systems depending upon the cab comfort needs. They are also called Direct-Fired Heaters, Cab Heaters, or Bunk Heaters. This type of technology is fairly inexpensive.

Insulation

Used in a vehicle or equipment with a closed cab, insulation is the baseline for reducing idling and can work in conjunction with the other listed technologies. Regardless of what type of system is being used it will not need to work as hard from running heating/cooling systems in driving situations if the cab is well insulated thus reducing fuel consumption and idling.

Storage Air Conditioners/Battery Heaters

Used in onroad vehicles, thermal storage and battery-electric air conditioners (storage cooling) derive energy to recharge the storage device from the engine during operation or from plugging in to external power sources often found at truck stops. The engine uses a small quantity of extra diesel for recharging the air conditioner. The emissions from burning this fuel (which are controlled by the engine's emissions control system) occur on the road rather than at the truck stop or depot. Battery heaters work similarly but provide heating rather than cooling services. These technologies have the benefit of low operational costs, but also have the downsides of high upfront costs and lower quality cooling or heating.

Truck Stop Electrification

Electrification refers to a technology that uses electricity-powered components to provide the operator with climate control and auxiliary power without having to idle the main engine. This can be on-board

equipment (e.g., power inverters, plugs), off-board equipment (e.g., electrified parking spaces or systems that directly provide heating, cooling, or other needs) or a combination of the two. Electrification often occurs at a location where vehicles remain for long periods (e.g., ports, truck stops, and rail yards). Truck drivers have the benefit of there being no upfront costs, although there may be costs to use a system. There is also the problem that formal truck stops are uncommon, making electrified truck stops even rarer. A map of electrified truck stops can be seen here (http://www.afdc.energy.gov/conserve/idle_reduction_electrification.html).

Vehicle Electrification

Electrification can also take the form of complete vehicle electrification. Idling electric vehicles simply do not pollute. Electrifying vehicle fleets therefore has the added effect of reducing pollution caused by idling. This solution has high upfront costs and is only feasible for short distance operators such as dray trucks and some nonroad equipment.

SmartWay® Verified Idling Technologies

SmartWay® is an EPA program to encourage those involved in the goods movement sector to reduce fuel usage and emissions, often through technological improvements. EPA has researched many anti-idling technologies and verified the suitability of technologies from certain companies through their verified idling technologies program. A full list of verified and no longer verified technologies can be found on EPA’s SmartWay® website (<http://www3.epa.gov/smartway/forpartners/technology.htm>).

Funding Mechanisms

The technologies discussed earlier, and to a lesser extent the educational approaches, require to ensure implementation. In order to assist states and fleet owners, a variety of programs exist, which provide funding that can be used to install technologies and increase education with a focus on reducing idling. One should be aware that funding mechanisms that impact specific vehicles may not result in all benefits occurring in the jurisdiction if the vehicle conducts interstate travel.

Congestion Mitigation and Air Quality Improvement (CMAQ) Program

The CMAQ Program was designed to help areas, in nonattainment for the ozone and/or carbon monoxide National Ambient Air Quality Standards (NAAQS), reduce emissions from the transportation sector, as well as reduce congestion, through a variety of transportation projects. Several projects have been funded in the OTR under the portion of CMAQ money allocated to “Inspection and Maintenance (I/M) and Other Transportation Control Measures (TCM).” These projects are primarily focused on infrastructure improvements that reduce idling such as through truck stop electrification. Following are some examples of CMAQ funding being used to reduce idling:

Table 1: CMAQ financed idling projects in the OTR

State/MJO	Project	Reduction (if known) (tpy)			
		NO _x	VOC	CO	PM _{2.5}
Maryland	Installation of IdleAire advanced truck stop Electrification at two locations.	34			
New York	Taxi & black car idle reduction/fuel efficiency program in New York City.	10	11	201	0.4

More details of CMAQ-financed projects in the OTR can be found in “Review of CMAQ Projects that Reduce Oxides of Nitrogen, An Ozone Precursor (OTC 2014).”

Diesel Emissions Reduction Act (DERA) Program

Begun as part of the Energy Policy Act of 2005, DERA provides funds to reduce emissions from diesel vehicles and engines through retrofits and replacements, clean fuel use and alternative fuel conversions. One eligible use of this funding is the purchase and installation of APUs which reduce main engine idling, although they do not eliminate idling completely. Although many technologies were formerly eligible for DERA funding, funding is currently available for school buses, locomotives, shore connections, and truck stop electrifications for stand-alone projects. It is also available for other eligible, verified idle reduction technologies, only if the technology is combined on the same vehicle with a new eligible verified exhaust control. Following are some examples of DERA funding being used to reduce idling:

Table 2: DERA-financed idling projects in the OTR

State/MJO	Project	Known Reductions (tons)				
		Timespan	NO _x	VOC	CO	PM _{2.5}
Connecticut	2 projects involving early replacement of diesel trucks equipped with automatic shut-off technology to reduce idling emissions and lower fuel costs.					
	5 DERA recipients have developed driver awareness programs to promote idle reduction.					
Delaware	24 electrified truck parking spaces at the Smyrna Rest Area where the majority of the long haul truck traffic makes deliveries to the Walmart distribution center, two miles away.					
	20 reefer electrification outlets. The electrical outlets replaced the need for truck idling that previously supplied the power to the trailer refrigeration units parked at the trucking company’s facility in Wilmington, which operated primarily on the weekend.	Lifetime	2,013			6
MARAMA	Provided 50 percent of the cost of APUs to eligible and approved independent truck owner/operators and small transport company applicants in Delaware and Pennsylvania.	Annual	3			0.04
Maryland	MDE and MEA established an idle reduction technology grant program to provide financial assistance for the purchase and installation of idle reduction technology on trucks. Under the program APU were installed on 54 trucks and FOH were installed on four trucks.	Lifetime	556			13.1
Massachusetts	MassDEP’s Clean Markets Program has offered grants to owners of diesel-powered trucks and equipment servicing wholesale markets, warehouses, and distribution centers. The program has funded APUs and eTRUs. SEP and other funds have matched/supplemented DERA funds.	Lifetime				

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State/MJO	Project	Known Reductions (tons)				
		Timespan	NO _x	VOC	CO	PM _{2.5}
NESCAUM	APUs were installed on 17 locomotives, operating in Massachusetts, Rhode Island, Connecticut, and New York.	Lifetime	212		5779	6.8
	29 locomotives, owned and operated by 8 regional railroads in Connecticut, Massachusetts, New Hampshire, and Vermont are being equipped with APUs.	Lifetime	370			22
New Hampshire	Provided the New England Southern Railroad Co., Inc. ("NES") \$28,000 to purchase and install a Hotstart® DV coolant heating system and battery charger. Locomotive engines are typically designed to use water for engine cooling. However, the water can freeze in cold weather and crack the engine block. As a result, shutting locomotives off in cold weather has historically been avoided as much as possible.	Lifetime	117			2.9
	Installed 2 "MediDock" ambulance anti-idling kiosks at Frisbie Memorial. Ambulances often idle for extended periods in order to keep electronic medical devices charged and to keep patients and pharmaceuticals at proper temperature. Ironically, ambulances often idle directly outside emergency rooms where their emissions can affect patients.	Lifetime	28.7			17.8
New York	Implemented a project for the installation of 443 direct fired heaters on school buses.					
	Implemented a project for the installation of 9 APUs on freight locomotives.					
Pennsylvania	Installed truck stop electrification kiosks at 28 truck parking spaces at the New Stanton Service Plaza, located in Westmoreland County, Pennsylvania.	Annual	165	0	0	4.7
	Replaced 58 diesel-powered pieces of ground support equipment (GSE) with electric GSE at Philadelphia International Airport	Annual	11.8	0.8	13.2	0.8
	Retrofitted 33 diesel-powered waste hauling vehicles with DPFs.	Lifetime	0	2.5	5.8	1.3
Vermont	Developed and implemented a project for the installation of 4 shore power-type electrification "kiosks" at two hospitals to power onboard equipment and provide cabin climate control for emergency-response vehicles and help reduce exposure of sensitive populations to harmful diesel exhaust.	Lifetime	25			0.7

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More details of DERA-financed projects in the OTR can be found in “Mobile Source Pollution Reduction Success Stories (OTC 2014).”

Supplemental Environmental Projects (SEP)

SEPs are projects that are funded as part of a settlement for an environmental violation. The project must be related to the environmental harm caused by the violation, be additive, and benefit the public health and environment. Following are some examples of SEP funding being used to reduce idling:

Table 3: SEP financed idling projects in the OTR

State/MJO	Project	Reductions (if known) (tons)				
		Timespan	NO _x	VOC	CO	PM _{2.5}
Massachusetts	Installed idling reduction technologies on 22 commuter rail locomotives.	Lifetime	212		5779	6.8
New Jersey	Using SEP funds provided by Valero Energy Corporation an ambulance plug-in station was established at Underwood Memorial Hospital in Woodbury, NJ. In addition, a locomotive block heater plug-in station was built at the Valero Refinery, in Paulsboro, NJ.	Lifetime	27			0.9

More details of SEP financed projects in the OTR can be found in “Mobile Source Pollution Reduction Success Stories (OTC 2014).”

State Funding Mechanisms

Individual states have also set up funding mechanisms to implement projects that reduce diesel emissions including funding technologies that reduce idling. Some examples of programs that a funded through states are:

- Pennsylvania’s Department of Environmental Protection offers the Small Business Advantage Grant Program, which provides 50% reimbursement matching grants, up to \$9,500, to enable Pennsylvania small businesses to adopt or acquire equipment or processes that promote Energy Efficiency (E2) or Pollution Prevention (P2), which includes the purchase of commercially available Auxiliary Power Units (APUs), bunk heaters, or other anti-idling technologies listed on the EPA SmartWay Transport Partnership website.

Summary

All jurisdictions in the OTR have restrictions on idling of buses and heavy-duty diesel vehicles, and many have restrictions on other diesel vehicles, gasoline vehicles, nonroad equipment, and rail engines. The jurisdictions have all undertaken a variety of approaches to educate owners/operators and the public at large about idling restrictions and the dangers posed to public health from idling. Enforcement does remain a challenge, given the vast geographic and temporal scope that idling can occur in and the challenges posed in interpreting exemptions. Technologies provide a different approach to reducing idling, which in many cases can also lead to an accrual of economic savings to the owners and operators while substantially reducing emissions. Also, funding opportunities are available through a variety of federal programs, which can be used to install technologies, in particular those that affect a larger

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number of operators for shorter periods of time. Finally, as diesel engines become cleaner, natural gas replaces diesel, and vehicle electrification becomes more common, idling in general will have lesser impact on public health.

Appendix A – Overview of Idling Restrictions

All jurisdictions in the OTR and the District of Columbia restrict idling from heavy-duty onroad vehicles, with the majority of these restrictions occurring through legislation. Some municipalities within a few of the states have additional restrictions on idling that go beyond the state level statute or regulation. Three of the states also restrict idling from light-duty vehicles. Five of the states and the District of Columbia also place restrictions on the idling of nonroad equipment, with two of those also placing idling limits on railroad engines.

The time limit for which idling is allowed varies from three to five minutes with about the same number of jurisdictions having each length of time limit. There are a variety of exemptions and allowable behaviors found within the statutes and regulations. These exemptions will be discussed in greater detail later in the document. A list of the OTR jurisdictions and any applicable idling restrictions in place, along with the most applicable allowable time limit for idling, can be found in **Error! Reference source not found.**

Table 4: Idling time limit by jurisdiction and citation of statute/regulation

State	Light-duty Onroad	Heavy-duty Onroad	Nonroad	Rail	Citation
CT	3	3	3		RCSA §22a-174-18
DE		3			7 DE Admin Code 1145
DC		3	3		20 DCMR § 900.1
ME		5			38 M.R.S. §585-L
MD		5	5		MD Code §22- 402(c)(3)
MA	5	5	5	30	M.G.L. c. 90 §16A and §16B; 310 CMR 7.11; 540 CMR 27.00
NH		5			Rules ENV(A) 1102.02
NJ	3	3	3		N.J.A.C. 7:27- 14&15
NY*		5			6 NYCRR Subpart 217-3
PA**		5			Act 124 of 2008; P.L. 1511, No. 124
RI		5	5	“Unnecessary”	P.L. § 23-23-29.2
VT		5			23 V.S.A. § 1110
VA		3			9VAC5-40-5670 (C)
<p>* New York City has additional idling restrictions. ** Alleghany and Philadelphia Counties have additional idling restrictions.</p>					

Exemptions to Idling Restrictions

Exemptions are one aspect of idling regulations that make enforcement challenging. Whether it is increasing the amount of allowable idling time during certain circumstances or exempting certain types of vehicles or activities, the increased complexity means it is more likely confusing for enforcement officials as to what idling is allowed and when. This section reviews some exemptions in state rules that are important and some that states have found problematic.

Some exemptions occur in nearly every jurisdiction in the OTR. In general they often concern safety of operation or performance of a necessary task (or a combination of the two). Idling necessary for vehicle maintenance falls into this category as does operating during extreme cold, and to a lesser extent heat. Being stuck in traffic is also considered to be exempted since you need to be able to quickly move your

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vehicle. Idling when performing emergency services, an actions that requires load (e.g., operating a crane), or military training activities are also common exemptions.

Some less common examples of exemptions are:

- Antique vehicles
- Residential lawn equipment
- Clean idling vehicles
- Armored vehicles
- Farm vehicles
- Mining vehicles

Appendix B – Survey of Onroad Idling Restrictions

State	Limit (min.)	Penalties	Applicability	Exemptions	Description of Strategies for:	
					Enforcement	Education & Outreach
CT	3	Fines: Not >\$5,000 per week	Any Mobile Source, with exceptions listed in next cell below. RCSA 22a-174-1(74) - “Mobile source” means a source designed or constructed to move from one location to another during normal operation except portable equipment and includes, but is not limited to, automobiles, buses, trucks, tractors, earth moving equipment, hoists, cranes, aircraft, locomotives operating on rails, vessels for transportation on water, lawnmowers, and other small home appliances.	<ul style="list-style-type: none"> * Traffic conditions or mechanical difficulties over which operator has no control * Ensure safety or health of driver/passengers * Auxiliary equipment * Conform to manufacturer’s specifications * Less than 20° F * Maintenance * Queuing to access military installation <p>Also exempt:</p> <ul style="list-style-type: none"> • Antique mobile sources (> 30 yr old); • Mobile sources used exclusively for racing; • Mobile sources undergoing mechanical repairs or testing; • Aircraft; • Locomotives operating on rails; • Vessels operating on water; and • Commonly used residential lawn, garden and snow removal equipment. 	<p>When idling problems are brought to our attention,</p> <p>School Buses: We issue violations when found, if none are observed we speak/conduct outreach with the driver, school, and bus company. We also provide anti-idling brochures and posters and connect them with compliance group if they want permanent signs. In situations where it may be a re-occurring problem we coordinate with local/state police who can ticket school bus drivers that violate the 3-minute limit rule.</p> <p>Commercial Vehicles: We issue violations when found, if none are observed we speak/conduct outreach with the driver, vehicle owner (if different) and property owner where the idling is occurring, which may also be different from the owner/operator. We provide anti-idling brochures and posters to anyone who wants them and direct them to the DEEP store to purchase permanent signs. We coordinate with local police departments some of whom have local ordinances they can employ, the ones that don’t will investigate and speak with truck drivers who are found violating the law, which is valuable for after-hours problems</p>	<ul style="list-style-type: none"> • Dedicated webpage for Idling rule, enforcement, education, and outreach that is still active www.ct.gov/deep/anti-idling • Created Wastebusters Video on Idling Myths available on YouTube and DEEP website • Idling "Ticket" Brochure used by field staff and available for public outreach events (free) • “Idling is Fuelish” poster available to the public (free) • Casey’s Clean Air Week – A children’s book created to teach young children (~ 4-7 yr old) the importance of air quality and advises children and adults of simple steps they can take to help prevent or reduce air pollution when using cars. This is being distributed to all of CT’s schools, licensed day care facilities, libraries and pediatrician offices. • Anti-Idling metal signs for CT K-12 schools (free), municipalities and businesses. Nearly 80% of CT schools have received signage. Municipalities and businesses may purchase signs from DEEP or directly from the vendor.

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State	Limit (min.)	Penalties	Applicability	Exemptions	Description of Strategies for:	
					Enforcement	Education & Outreach
DE	3	Fines: \$50 - \$500 per offense	All on-road heavy-duty motor vehicles >8,500 pounds	<ul style="list-style-type: none"> * Traffic conditions or mechanical difficulties * Conform to manufacturers specifications * Repair * Emergency vehicles * Using auxiliary equipment/power take off * Power during sleeping or resting beyond 25 miles of truck stop with available electrified equipment * Vehicle safety inspections * Busses for 5 minutes during passenger boarding, or when passengers onboard * 15 minutes: 32° to -10° F & No limit: Less than -10° F * Military vehicles during training 	Difficult to enforce	The State has provided Truck stop electrification stations around the state. The state has provided outreach on these stations. The state is also in the process of implementing an anti-idling program at Delaware schools and has implemented a school bus idling survey by observing idling practices of school buses.
DC	3	Civil infraction ticket (\$500 fine for first-time violation)	Any person owning, operating, or having control over the engine of a gasoline or diesel powered motor vehicle	<ul style="list-style-type: none"> * Private non-commercial passenger vehicles are exempt * Vehicles may idle for 5 minutes when temps are below 32°F * Engines may idle when necessary for the operation of power takeoff * Equipment such as dumping beds, cement mixers, refrigeration systems, winches, or shredders 	Map of idling zones that are prioritized; enforcement by multiple agencies	<ul style="list-style-type: none"> * Bike outreach event * Regular communications and meetings with industry reps * www.turnyourengineoff.org
ME	5	Traffic Infraction	Commercial Vehicles	see bill	Not enforced by DEP	
MD	5	Fines: Not >\$500	All motor vehicles	<ul style="list-style-type: none"> * Traffic conditions or mechanical difficulties * Heating, cooling or auxiliary equipment * Conform to manufacturer's specifications * Accomplish intended use 	Difficult to enforce due to exemptions	Previous driver education and reward program, web site still active: www.turnyourengineoff.org/
MA	5	Fines: Not >\$100 – 1st Not >\$500 each succeeding		<ul style="list-style-type: none"> * Being serviced * Delivery for which power is needed & alternatives unavailable * Associate power needed & alternatives unavailable 		

Overview of Efforts to Reduce Idling in the Ozone Transport Region

State	Limit (min.)	Penalties	Applicability	Exemptions	Description of Strategies for:	
					Enforcement	Education & Outreach
NH	5	Commissioner can issue a notice of violation and an order of abatement. Fines for a minor violation such as illegal idling ranges from not less than \$100 and not more than \$1,000.		<ul style="list-style-type: none"> * Traffic conditions * Emergency vehicles * Power takeoff or heat/cool passengers * Maintenance or diagnostics * Defrost windshield * 15 minutes: 32° to -10° F & No limit: Less than -10° F 	Enforcement by Air Division staff would be in response to complaints on a case by case basis.	Outreach and education provided through information on DES web site, articles in DES newsletters, presentations at public events such as Regional Planning Commission meetings, etc.
NJ	3	Fines: \$100 for 1st \$200 for 2nd \$500 for 3rd \$1,500 for succeeding Penalties: For commercial vehicle and property owner \$250 for first violation \$500 for second violation \$1000 for succeeding	Gasoline and Diesel powered	<ul style="list-style-type: none"> * Traffic conditions * Mechanical operations * Waiting or being inspected * Performing emergency services * Being repaired or serviced * Auxiliary power unit/generator set, bunk heaters, etc. * Sleeper berth with 2007 or newer engine or diesel particulate filter 	Periodic idling sweeps 50% rule effectiveness used in a SIP/rule revision in 2006.	No idling campaign which includes: brochures, keychains, bookmarks, fake idling tickets. No idling pledge for transportation companies and schools.
NY	5	Fines: \$500 - \$18,000 – 1st offense Up to \$26,000 – succeeding	Diesel and non-diesel onroad HD (>8500 #)	<ul style="list-style-type: none"> * Traffic conditions * Comply with passenger comfort laws * Auxiliary power or maintenance * Emergency vehicles * Within mines or quarries * Parked for more than 2 hrs & less than 25° F * State Inspections * Recharging hybrid electric vehicles * Farm vehicles * Electric vehicles 	Periodic sweeps and complaint basis by DEC uniformed Env. Conservation Officers, ability to enforce by local law enforcement.	Rest area signage by DOT. Free signage for private areas (loading docks, ports, bus lots, etc.) provided by DEC.

Overview of Efforts to Reduce Idling in the Ozone Transport Region

State	Limit (min.)	Penalties	Applicability	Exemptions	Description of Strategies for:	
					Enforcement	Education & Outreach
PA	5 consecutive minutes per 60-minute period (15 minutes if sampling, weighing, or loading)	Fines: \$150-\$300 per offense (plus civil penalties up to \$1,000)	Applies to owners and operators of diesel-powered motor vehicles with a gross weight of 10,001 pounds or more, engaged in commerce, (idling time limit) and owners and operators of locations where subject vehicles loads, unloads, or parks, plus a requirement to display No Idling signs.	<ul style="list-style-type: none"> * Traffic conditions * Prevent safety or health emergencies * Comply with manufacturer's specifications * Emergency or law enforcement purposes * Maintenance or repair * Government or security inspections * Power work related operations * Mechanical difficulties * Certified Clean Idle label 	Numerous agencies are authorized to enforce the provisions of Act 124 of 2008 including, state police, local police and some employees of the Pennsylvania Department of Environmental Protection. State and local police will issue a non-traffic citation for a witnessed violation. Department employees may issue either a non-traffic citation under Act 124 or a notice of violation under the Pennsylvania Air Pollution Control Act for a witnessed violation. Citizens who wish to report a violation can call state police, local police or Department staff.	Three organizations received grants from the Department to perform outreach activities to educate the public and affected entities about Act 124. The organizations coordinated with each other and the Department to produce handout materials, presentation materials, posters, turnpike tollbooth wraps and other outreach materials that were distributed by the groups during 2009 and 2010. Additionally, staff from the Department's central office went to all of the Department's regional offices to provide training on the implementation and enforcement of Act 124 of 2008, in order to ensure consistency in enforcement statewide. Additionally, on an ongoing basis the Department's staff responds to violation complaints, answers questions from the public, and maintains information about the Act on the Department's website.
PA (Alleg. Cnty.)	Yes/No. Regulations restricting idling are still included in Allegheny County Health Department (ACHD) Regulations but are superseded by Act 124 of 2008 per 35 P.S. §4609, and are no longer being enforced by ACHD.					

Overview of Efforts to Reduce Idling in the Ozone Transport Region

State	Limit (min.)	Penalties	Applicability	Exemptions	Description of Strategies for:	
					Enforcement	Education & Outreach
PA (Phila. Cnty.)	<p>Philadelphia AMS: A. The maximum allowable period of idling shall not exceed two (2) consecutive minutes or zero (0) for layovers for the engine of a heavy duty diesel powered motor vehicle.</p> <p>Philadelphia Parking Authority: 3 minutes for all motor vehicles except buses and trucks, with some exemptions with no time limit for idling. 5 minutes for buses and trucks, with some exemptions with no time limit for idling.</p>	<p>Philadelphia AMS: \$300 fine per Philadelphia Code §1-109(1).</p> <p>Philadelphia Parking Authority: Parking ticket with \$101 fine for each violation of Philadelphia Code § 12-1127, as well as other applicable costs and fees (per Chapter 12-2800).</p>	<p>Philadelphia AMS: Operators of heavy duty diesel powered motor vehicles, and persons with control over the operation of subject vehicles.</p> <p>Philadelphia Parking Authority: Operators of all motor vehicles, including buses and trucks.</p>	<p>Philadelphia AMS</p> <ol style="list-style-type: none"> 1. Up to 5 consecutive minutes when the ambient temperature is less than 32° F. 2. Up to 20 consecutive minutes when the ambient temperature is less than 20°F. 3. Up to 20 consecutive minutes for buses equipped with air conditioning and non-openable windows and the ambient temperature is equal to or greater than 75°F. <p>Philadelphia Parking Authority</p> <ol style="list-style-type: none"> (a) the outside temperature is less than 20°F; (b) an Authorized Emergency Vehicle, including Public Utility vehicles engaged in emergency repair work and maintenance; (c) vehicles engaged in road repairs performed by or on behalf of a governmental entity; (d) vehicles which are being serviced; for which idling is part of that service; (e) vehicles that must idle to operate auxiliary equipment, excluding vehicle heaters and air conditioners; (f) vehicles estopped by traffic congestion; or (g) a bus or truck idling at any terminal point along an established route 	<p>Philadelphia AMS: Philadelphia Air Management Services Enforcement Officers are authorized to write Notices of Violation for idling restriction violations. However, not many violations have been written up in recent years due to staff shortages. Additionally, Clean Air Council in Philadelphia has set up a phone texting system to report complaints and has staff on the street reporting violations to AMS. Philadelphia</p> <p>Parking Authority: Philadelphia Enforcement Officers and Philadelphia Police Department Officers can both issue parking tickets for violations of Section 12-1127.</p>	<p>Philadelphia AMS: Clean Air Council has conducted education and outreach campaigns in the past. Currently they run the www.IdleFreePhilly.org website and are engaged in 'on the street' reporting of violations, as well as starting a program where citizens can text idling violation complaints to a number and the information is forwarded to AMS. AMS has not conducted any outreach or education in recent years.</p> <p>Philadelphia Parking Authority: No known outreach or education efforts have been conducted in recent years.</p>

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State	Limit (min.)	Penalties	Applicability	Exemptions	Description of Strategies for:	
					Enforcement	Education & Outreach
RI	5 consecutive minutes per 60-minute period	Fines: Not >\$100 – 1st Not >\$5000 each succeeding	Diesel Engines	Include, but not limited to: 1) emergency response, public safety, or military vehicles 2) armored vehicles being loaded or unloaded 3) non-road vehicles 4) vehicles making deliveries of fuel or energy products.	Jurisdiction for enforcement shall be with state and local law enforcement authorities, including, but not limited to, state and local police and parking enforcement personnel, the RI Department of Environmental Management and the RI Department of Motor Vehicles.	Conducted in 2007 Also have information on DEM - Office of Air Resources Webpage
VT	5 consecutive minutes per 60-minute period	Fines: Not >\$10 – 1st violation Not >\$50 – 2nd violation Not >\$100 – 3rd & succeeding	All motor vehicles	<ul style="list-style-type: none"> * Public safety or emergency purposes * Armored vehicle being loaded or unloaded * Traffic conditions or control * Health or safety of occupant * Maintain passenger comfort on passenger bus * Operate safety equipment * Power work & related operations * Air conditioning or heating an occupied sleeper berth in model year 2017 or older vehicle * Maintenance or diagnostics * State or federal inspections * Necessary to maintain the premises of the place of business of registered motor vehicle dealer * GVWR<10,000 lbs. on private property * Idle reduction technologies 	This is a motor vehicle violation to be enforced by state and local law enforcement authorities. It is difficult to enforce.	<ul style="list-style-type: none"> * All driver education courses include instruction on idling law and the adverse environmental, health, economic and other effects of unnecessary idling. * Idling rack cards are located in state buildings and rest areas. * Vermont Idle-Free Fleets: A Free Online Training for Vermont Diesel Truck Drivers and Fleet Managers was developed in partnership with the Vermont DEC, the American Lung Association Northeast and the University of Vermont Certification for Sustainable Transportation. http://www.anr.state.vt.us/air/MobileSources/htm/ReducingDieselEmissions.htm#VermontIdleFreeFleets
VA	3 minutes in commercial or residential urban areas	Fines not >\$25,000		<ul style="list-style-type: none"> * Auxiliary Power * 10 minutes for tour buses during hot weather * 10 minutes for diesel powered vehicles to minimize restart problems 		

Appendix C – Survey of Nonroad Idling Restrictions

State	Regulated?	Limit (min.)	Penalties	Applicability	Exemptions	Description of Strategies for:	
						Enforcement	Education & Outreach
CT	Yes	3		See on-road section. Includes rail engines.	See on-road section	See on-road section	See on-road section
DE	No						
DC	Proposed on July 17, 2015: ⁵	3	Based on OTC model rule	Based on OTC model rule	Based on OTC model rule		
ME	No						
MD	Yes	5					
MA	Yes						
NH	No						
NJ	Yes	3	Fines: \$100 for 1st \$200 for 2nd \$500 for 3rd \$1,500 for succeeding Penalties: For commercial vehicle and property owner \$250 for first violation \$500 for second violation \$1000 for succeeding	diesel powered			
NY	No						
PA	No						

⁵ <http://www.dcregs.dc.gov/Gateway/NoticeHome.aspx?NoticeID=5553170>

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State	Regulated?	Limit (min.)	Penalties	Applicability	Exemptions	Description of Strategies for:	
						Enforcement	Education & Outreach
PA (Alleg. Cnty.)	Yes	Five (5) consecutive minutes, with some exemptions.	1. A penalty of \$100 for the first offense. 2. A penalty of \$500 for the second offense, and any subsequent offenses.	Any person or business that owns or operates any diesel-fueled off-road compression ignition vehicle engine with maximum power of 25 horsepower (hp) or greater that is used to provide motive power in any vehicle that is not designed to or cannot be registered and driven safely on-road and is not an implement of husbandry.	This Section does not apply to locomotives, commercial marine vessels, marine engines, recreational vehicles, military equipment, stationary or portable equipment, or equipment or vehicles used in agricultural operations, or equipment at ports or intermodal railyards, or off-road diesel vehicles owned and operated by an individual for personal, noncommercial purposes. Other exemptions include: 1. Idling necessary to ensure the safe operation of the equipment, including idling to verify that the equipment is in safe operating condition and equipped as required by all provisions of law, and all equipment is in good working order, either as part of the daily equipment inspection, or as otherwise needed. 2. Idling required to bring the machine system to operating temperature; 3. Idling for testing, servicing, repairing, or diagnostic purposes; 4. Engine operation necessary to accomplish work for which the equipment was designed (such as operating a crane); 5. Idling necessary for the operator's physical wellbeing while accomplishing such work; 6. Idling when queuing, i.e. when an off-road vehicle, situated in a queue of other vehicles, must intermittently move forward to perform work or a service, and when shutting the vehicle engine off would impede the progress of the queue and be impractical. This does not include the time an operator may wait motionless in line in anticipation of the start of a workday or opening of a location where work or a service will be performed; and 7. Idling by any vehicle being used in an emergency or public safety capacity.	Non-road idling restrictions may be enforced by any municipal or local government unit having jurisdiction over the place where the idling occurs, as well as by ACHD staff. Enforcement may include issuance of an Enforcement Order, initiation of summary criminal proceedings, assessment of civil penalty, or other enforcement methods allowed under ACHD Rules and Regulations-Article XXI-Section 2109.02	ACHD has performed numerous outreach and education activities relating to this regulation. Information about the regulation is available on ACHD's website. Additionally, handout materials, including paycheck (standard envelope) inserts and stickers explaining the law for non-road operators, are available. ACHD also reaches out to the media to discuss this regulation through press releases and has addressed it in the ACHD newsletter.
RI	Yes	5 consecutive minutes during a 60-minute period	\$100/first offense and up to \$500 for each succeeding offense.	Non-road diesel engines, shall include, but may not be limited to, construction engines, airport ground support equipment, commercial and industrial equipment. Includes Marine and Rail.	Include, but not limited to, airfield maintenance vehicles when they are being used on a state-owned or operated airport; diesel powered engine and/or vehicles that must continuously operate while stationary in order to function property; a vehicle making deliveries of fuel or energy products.	Jurisdiction for enforcement shall be with state and local law enforcement authorities, including, but not limited to, state and local police and parking enforcement personnel, the RI Department of Environmental Management and the RI DMV.	Conducted in 2007
VT	Yes						
VA	No						