

TRUCK DRIVERS' PERSPECTIVES ON VEHICLE IDLING

Dorothy Yen, University of Waterloo
Jean Andrey, University of Waterloo
Clarence Woudsma, University of Waterloo

Introduction

Automotive exhaust as a source of air pollution first garnered attention in the 1950's because of by-products associated with the incomplete combustion of hydrocarbon fuels. While concern over these low-volume emissions and their associated health impacts continues, anxiety is also mounting over the role of automobile exhaust in changing atmospheric levels of carbon dioxide, an important greenhouse gas.

Various strategies have been adopted or are being considered to reduce tailpipe emissions from roadway vehicles. From an air quality perspective, the introduction of catalytic converters and unleaded gasoline were pivotal. From a greenhouse gas perspective, engine and vehicle designs as well as alternative fuels hold promise. Despite these technological improvements, however, vehicular emissions are now the predominant source of urban air pollution worldwide (Sharma *et al.* 2001) as well as the fastest growing source of global carbon emissions—largely because of increased motorized transport. Many could argue, therefore, that engine/fuel solutions need to be complemented with behavioural strategies, particularly as they may relate to the over use or inefficient use of motor vehicles. One particularly inefficient, yet widespread, practice is vehicle idling.

The current study provides insight into truck idling in Ontario by providing primary data on vehicle idling behaviour, the adoption of anti-idling strategies, and drivers' perspectives on related initiatives.

Truck Emissions and “Green” Initiatives

Over the past few decades, freight movement has grown steadily, especially the demand for trucking, because of economic growth, liberalised trade, industry deregulation, and just-in-time delivery. As a result, there are more trucks on the road; between 2000 and 2005, the number of registered tractor-trailers in Canada increased by 32 percent (Statistics Canada 2006a and 2006b). More truck traffic translates into more emissions. From 1990 to 2006, the greenhouse gas emissions for this shipping mode increased by more than 90 percent (Natural Resources Canada 2008).

Idling contributes to vehicle emissions by large trucks. Various studies provide estimates of the annual idling time of trucks of different types/fleets. Despite variation in the estimates, there is some agreement that the average idling baseline is between six and seven hours per day with an annual fuel consumption loss of approximately 7500 litres (Boeckenstedt 2005, Lutsey *et al.* 2004 and Stodolsky *et al.* 2000). However, researchers emphasise that idling time varies depending on the season, operations, routes, etc. (Bronson Consulting Group 2008, Brodrick *et al.* 2001 and Stodolsky *et al.* 2000). For example, the Edison Institute argues that the average idling time and level of emissions are higher for Canadian drivers because Canada has a harsher climate than the United States (Government of Alberta 2009).

Driver attributes including ownership, experience and age also may influence idling behaviour. For example, one study suggests that owner-operators tend to have lower average idling duration of 5.1 hours compared to 6.1 hours for company drivers (Lutsey *et al.* 2004). However, Schweitzer *et al.* (2000) caution that socio-demographics variables as well as environmental attitudes are ineffective predictors of the adoption of anti-idling-reduction strategies.

While data from the past are a useful starting point, the socio-political landscape has changed considerably over the past few years. Of

relevance to the current situation are increased environmental awareness, volatility in fuel prices, discussions about carbon taxes, and green transportation/anti-idling initiatives. Not surprisingly, many trucking firms have begun to make changes, partly to reduce operating costs since fuel consumption is a major expense; for example, in 2000, owner-operators spent 26 percent of their operating expenses on fuel (Transport Canada 2003). As well, green initiatives can help the industry to enhance its image, be socially responsible, innovative and gain access to new markets as they address environmental issues and move towards a more sustainable transportation system (Eden 1996, Welford 1997, Whitehead and Walley 1994).

Changes in the transport sector are occurring (McKinnon 2003). Companies that rely on carriers for their transport needs are sometimes demanding information on environmental footprints before establishing a business partnership. Murphy and Poist (2003) indicate that seventy percent of American firms and nearly eighty percent of Canadian and Western European firms are not dealing with suppliers who lack an environmental and social responsibility agenda. Wal-Mart Canada, for example, is showing green leadership by implementing a supply-chain sustainability scorecard. Firms such as the Hudson Bay Company have joined governmental programs, FleetSmart and SmartWay, in order to gain recognition for their environmental efforts (Kuzeljevich 2009, Menzies 2008).

In fact, many truck stops across Canada have joined FleetSmart's Annual Quiet Zone campaign to raise awareness in the trucking industry about the harmful effects and financial loss of unnecessary engine idling. The number of participating sites has gradually increased from 17 in 2002 to over 60 in 2009. The goal of the 12 week campaign is to have an idle-free area, which is known as the "Idle-Free Quiet Zone" (Natural Resources Canada 2009a).

There are various other educational programs for the trucking industry related to vehicle operation and/or idling. For example, "Fuel Management 101" is an annual one day workshop that is designed for fleet managers to identify energy-efficient solutions and

prepare fuel management plans for their companies. “SmartDriver” for Highway Trucking offers an information toolkit to fleet managers. The toolkit consists of case study examples, fleet profiles, workshops and technical demonstrations. An Idling Reduction Toolkit was originally developed by Motor Coach Canada but has now been applied to the trucking industry (Natural Resources Canada 2009b and 2009c). A third example is provided by the early efforts of the Canadian Centre for Pollution Prevention (2005).

In recent years, the Canadian government has lead various initiatives to reduce transport emissions. The most recent example is the ecoFREIGHT initiative, which includes five components that are of relevance to trucking: a national harmonization initiative to identify regulatory barriers and solutions for trucking, a fuel reduction initiative referred to as ecoENERGY, a freight technology demonstration fund, a freight technology incentive program, and a partnership program focused on voluntary actions to reduce emissions (Government of Canada 2009). Of particular relevance to vehicle idling are the second and fourth components.

The Provinces are also getting involved in greening the trucking industry. For example, in 2008, the Ontario government launched the Green Commercial Vehicle Program to support Ontario’s Go Green Action Plan. The four-year project provides companies with financial aid to help purchase anti-idling technologies: auxiliary power units, cab heaters or coolers (Ontario Ministry of Transportation 2009). Finally, a number of municipalities have introduced idling regulations, in the form of stand-alone idling bylaws or other types of provisions (Natural Resources Canada 2009d).

The current study provides recent data on truck idling in the Province of Ontario, including information on truckers’ awareness of these recent government initiatives.

Data and Methods

In order to assemble primary data on truck idling, a one-page double-sided questionnaire was administered to truck drivers at one public truck stop and two private trucking facilities in the Greater Toronto area. The questionnaire included a mix of open- and closed-ended questions. On five days in March 2009 (17th to 20th and 23rd) drivers were randomly approached and invited to complete the questionnaire.

Of the 111 drivers who were asked to participate in the study, 88 completed the survey, resulting in a response rate of 79 percent. Most completed the questionnaire onsite, but 11 mailed their responses. A few drivers asked the researcher to read out-loud the questions and record the answers for them. In some cases, drivers discussed the questions with the researcher and other participants, sharing their thoughts and experiences. Some drivers even showed the researcher their anti-idling devices on-board their tractors.

Of the 88 study participants, 18 were company drivers responsible for pulling trailers between yards located within the same city, 46 were long-haul fleet drivers working for a motor carrier, and 22 were owner-operators. Most (n=73) respondents were single (versus team) drivers, probably reflecting the location of the survey sites within the Quebec City-Windsor corridor. Their driving experiences varied, providing a good cross-section of driving histories (Table 1).

Table 1: Characteristics of Participating Drivers

Type of Driver	Number of Years of Commercial Truck Driving					Total
	0-10	11-20	21-30	30+	unknown	
Company, City	8	5	2	3		18
Company, Long-haul	15	9	8	12	2	46
Owner-Operator	5	8	5	4		22
Unknown					2	2

Anti-idling Strategies

The survey data provide a snapshot of the degree of penetration of anti-idling strategies in Ontario's trucking sector. As shown in Table 2, two-thirds of the drivers operate a tractor with an anti-idling device; this includes a majority of both company drivers and owner-operators. Among the remaining one-third, many of the drivers are employed by or own a company that either has a no-idling policy and/or recognizes idling reduction behaviour, typically in the form of a monetary bonus, gift certificate or bonus. In total, therefore, 74 of the 87 respondents who provided answers to one or more of these three questions operate in a corporate environment where truck idling is either prohibited or actively discouraged.

Different types of anti-idling devices are in use on the tractors operated by the study drivers. Thirty-four have automatic engine shut-off devices, 14 have direct-fired heaters, three have Thermo-king generators, and a few have other auxiliary power units (APUs). For company operators, the decision to install the device is typically made independent of driver input; owner-operators are often motivated by cost savings. When asked about whether these devices have any disadvantages some drivers commented on issues related to temperature control of the cab and to the problem of the battery draining. There was also a sentiment expressed by some that such a device is a nuisance. For example, a single-company long-haul fleet driver wrote, "Just as you're about to go, the damn truck shuts off."

Idling Behaviour

Study participants were also asked to recall and record the number of times that they idled off-road in the 24 hours preceding their completion of the questionnaire. Drivers were asked about both 'short idles' (defined as 15-60 minutes) and 'long idles' (defined as longer than one hour). As displayed in Table 3, more than half the respondents of each driver category reported they had not let their engines run for more than 15 minutes in the preceding 24 hours.

Table 2: Anti-Idling Strategies

Does your tractor have an anti-idling device?	Does your company have a no-idling policy?	Does your company recognize/reward idling reduction?
Yes (n=59)	Yes (n=35)	Yes (n=8) No (n=22) Unknown (n=5)
	No (n=14)	No (n=14)
	Unknown (n=10)	Yes (n=1) No (n=5) Unknown (n=4)
No (n=27)	Yes (n=13)	Yes (n=4) No (n=7) Unknown (n=2)
	No (n=13)	Yes (n=3) No (n=9) Unknown (n=1)
	Unknown (n=1)	No (n=1)
Unknown (n=2)	Yes (n=1)	Unknown (n=1)
	Unknown (n=1)	Unknown (n=1)

Overall, the proportions that had not engaged in truck idling accounted for 56 percent (49/88) and 78 percent (69/88) for short-idles and long-idles, respectively. The weather may have influenced the results of the survey because temperature was the most mentioned reason for idling, and Environment Canada recorded above seasonal average temperatures on two of the five study days; the average temperature on these two days was 5.0°C on March 17th and 8.8°C on the 18th. These moderate temperatures may have contributed to drivers turning off their engines.

Drivers were asked to list up to three reasons for or circumstances under which they tend to leave their engine on. Of the 88 drivers, 19 did not provide a response but the remaining 69 drivers provided a total of 114 reasons. Temperature was cited 65 times as a reason for

idling, with cold being mentioned 43 times and hot weather being cited 14 times. The second most frequently cited reason for idling was to maintain the tractor/trailer (15 times), e.g., charging batteries. Two common circumstances associated with idling included waiting for dispatch and doing delivery/pickup.

Table 3: Idling Behaviour of Truck Drivers

Type of Driver	Type of idle	# Idling Incidents in Past 24 Hours					Row Sum
		0	1	2 or 3	4+	No answer	
Company, City	Short idle	11	3	3	1		18
	Long idle	15	2			1	18
Company, Long-haul	Short idle	24	8	6	4	4	46
	Long idle	35	4	1	1	5	46
Owner-Operator	Short idle	13	2	3	2	2	22
	Long idle	17	1			4	22
Unknown	Short idle	1			1		2
	Long idle	2					2
All drivers	Short idle	49	13	12	8	6	88
	Long idle	69	7	1	1	10	88

Anti-Idling Initiatives by Governments

As discussed earlier, various incentives and programs are available to encourage truck drivers to reduce their idling time. Drivers were asked if they could recall any such programs. Only 30 of the 88 truck drivers responded in the affirmative, and only 23 of the 30 were able to provide a label or short description of the initiative. The most common response, given by ten drivers, is that some of the American states such as California and New York do not allow idling. For example, one driver states, "In USA, truck stops and rest areas allow five minutes or less". A few others mentioned city bylaws and ticketing for idling infractions. This suggests a low level of awareness about recent Canadian initiatives.

Another questions asked drivers how Canada compares to the United States in term of anti-idling initiatives. Approximately one-quarter of the respondents (n=24) do not know because they do not operate outside of Canada, and almost as many (n=21) skipped the question. Of the 43 who answered the question, 22 indicated that the United States is more advanced in developing strategies to reduce truck idling. More specifically 12 of the drivers wrote that Canada is behind, six said Canada has fewer incentives/programs and four pointed out that Canada is not as strict. One driver went so far as to say that “Their head, in the sand” when talking about Canadian legislators or program developers. On the other hand, some drivers mentioned that Canadian driving circumstances presents challenges that are different from the USA and that Canada’s approach is more reasonable given these differences. Seven respondents indicated that Canada is ahead of the USA in terms of anti-idling initiatives.

As noted earlier, one of the Canadian initiatives is the creation of idle-free quiet zones. Drivers were asked about frequenting these zones. Approximately three-quarters (n=56) of respondents indicated that they do not avoid them, whereas a minority do (n=12)—sometimes because of cold temperatures and other times because they are seen as “a hassle” or as something that interferes with a driver’s right to idle. Consequently, a campaign is needed to market the advantages of parking in idle-free quiet zones. Such a campaign could also address some of the confusion that currently exists, since some of the survey responses seem to refer to American initiatives such the Truck Stop Electrification program and IdleAire, which charge fees; the Canadian program is not fee-based. In 2006, Natural Resources Canada points out that their education program helped increase awareness from 42 percent to 50 percent, but it would appear that further education is needed.

Since owner-operators are responsible for the maintenances and expenses of their tractor, it is perhaps not surprising that this represents the only group that is aware of financial incentives and programs. Three of the 22 drivers mentioned the rebate program and another talked about green commercial vehicles. As an aside, during the administration of the questionnaire, one of the owner-operators

was educated by another driver about how to proceed to get a partial refund on the purchase of the anti-idling device.

Participants were also asked whether Canada should impose a mandatory anti-idling policy. The responses reveal that half (n=45) of the drivers are against a mandatory anti-idling policy, one-third (n=29) are in favour of it, and the others are not sure or did not respond to the question. Of the 45 drivers who are against a mandatory anti-idling policy, 12 did not elaborate on their answer. However, 21 drivers did mention that temperature is an important reason why a policy should not be implemented. As noted by one driver, "In extreme winter weather some anti-idling devices don't keep batteries charged and you might not be able to start the engine." Others commented on how idling decisions should be up to the individual driver and should take into consideration the specific circumstances including weather and the availability and working order of heaters. Three drivers talked generally about there being too many regulations, and two drivers commented that trucks pollute less than other industries, so that they should not be singled out. One company long-haul fleet operator said; "...try asking, not telling or forcing. New rules will only cause more backlashes".

In terms of driver training, Natural Resources Canada (2009) states that close to 70 percent of Canadian fleets delivered some form of drivers training in fuel efficiency in order to help reduce idling. One of the questions in the current survey asked truckers if they have attended any talks or training about idling reductions. Overwhelming, 86 percent (n=76) of the drivers have never attended such sessions. Still, the vast majority (n=78) recognize that idling does cost money. Would such training impact behaviour? It is difficult to know; of the eight participants who confirmed that they attended a session about anti-idling, only five of them said that the experience has changed their behaviour.

Summary and Conclusion

A number of recent initiatives have been undertaken, largely by governments, to reduce truck idling in Canada. While awareness of

program specifics appears to be quite low, it is encouraging to observe that the majority of drivers involved in the study operate a tractor with an anti-idling device installed. As well, several operate for companies that have anti-idling policies and/or financial incentives for drivers to reduce vehicle idling. Drivers' views regarding anti-idling legislation is mixed, but there is a clear appreciation that idling behaviour costs money—and that in and of itself provides a rationale for limiting this behaviour. Based on drivers' self-reports, it appears that the majority of truckers do not engage in vehicle idling; although extreme cold and certain operational conditions do increase the frequency with which idling occurs. In conclusion, it appears that anti-idling technology is being rapidly adopted and drivers' awareness of idling-related issues is quite high. That said, drivers' knowledge of specific programs that are intended to provide fleet owners and tractor operators with information and sometimes financial assistance is still low, suggesting that continued effort should be put into the goal of empowering the trucking industry to move toward improved vehicle operation and reduce vehicle idling.

References

- Boeckenstedt, R. (2005). Alternatives to truck engine idling. Proceedings of the 2005 Mid-Continent Transportation Research Symposium. Accessed January 13th 2009, <http://www.ctre.iastate.edu/pubs/midcon2005/BoeckenstedtIdling.pdf>
- Brodrick, C.-J., Lutsey, N.P., Sperling, D., Dwyer, H.A. and Gouse, S.W. III. (2001). The market for fuel cell auxiliary power units for heavy-duty diesel vehicles: first widespread application of fuel cells in transportation? In Sperling, D and Kurani, K. (Eds). Transportation Energy and Environmental Policy. Accessed Jan. 13th 2009. <http://onlinepubs.trb.org/onlinepubs/conf/asilomar.pdf>
- Bronson Consulting Group. (2008). A Study of the Impacts of Heavy-Duty Idling as a Basis for Renewed Outreach Initiative. Ottawa.

Canadian Centre for Pollution Prevention (2005). Truckers Idling Reduction Program: Final Report. Accessed Jan. 6th 2009.
<http://www.c2p2online.com/documents/truckersidlingreductionfinalreport.pdf>

Eden, S. (1996). Environmental Issues and Business: Implications of a Changing Agenda. John Wiley & Sons. New York.

Government of Alberta. (2009). Truck Stop Electrification. Accessed March 27th 2009.
<http://www.transportation.alberta.ca/Content/docType57/Production/TruckElecStop.pdf>

Government of Canada (2009) ecoFREIGHT. Accessed February 25th 2010. <http://www.ecoaction.gc.ca/ECOTRANSPORT/ecofreight-ecomarchandises-eng.cfm>

Kuzeljevich, J. (2009). A commitment to change: In the quest for the new Holy Grail known as environmental sustainability, relationships are the factor that binds. Accessed March 30th 2009.
<http://www.trucknews.com/GreenSupplement/2008/a-commitment-to-change.asp>

Lutsey, N.P., Brodrick, C.-J., Sperling, D. and Oglesby, C. (2004). Heavy-duty truck idling characteristics: Result form a Nationwide Truck Survey. Transportation Research Record (1880) 29-38. Accessed Jan. 6th 2009.
<http://www.its.ucdavis.edu/publications/2004/UCD-ITS-RP-04-38.pdf>

McKinnon, A.C. (2003) Logistics and the environment. In Handbook of Transport and the Environment. Edited by Hensher, D.A. and Button, K. J. 665-683. Emerald Group Publishing. United Kingdom.

Menzies, J. (2008). The smart way to go GREEN. Truck News 28 (1) 35-37.

Murphy, P.R. and Post, R.F. (2003). Green perspectives and practices: a “comparative logistics” study. Supply Chain Management: an International Journal 8 (2) 121-131.

Natural Resources Canada (2006). Energy Efficiency Trends in Canada. Energy Publications. Canada.

Natural Resources Canada (2008). Energy Use Data Handbook Tables: transport sector. Accessed March 13th 2009
http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/handbook_tran_ca.cfm?attr=0

Natural Resources Canada (2009a). Idle-free Quiet Zone for Commercial Vehicles. Accessed March 23rd 2009.
<http://oee.nrcan.gc.ca/transportation/business/idling/truck-stop-idle-free-zone.cfm>

Natural Resources Canada (2009b). Idle-free Destination Toolkit for Motor Coaches and Transport Trucks Idle-free Destination Program. Accessed March 23rd 2009, <http://fleetsmart.nrcan.gc.ca/idling-reduction-toolkit/section1.cfm?attr=16>

Natural Resources Canada (2009c). SmartWay. Accessed April 1st 2009.
<http://oee.nrcan.gc.ca/transportation/business/fleetsmart/smartway/smartway.cfm?attr=16>

Natural Resources Canada (2009d). Existing Idling Control by-laws in Canada. Accessed April 5th 2009.
<http://oee.nrcan.gc.ca/communities-government/transportation/municipal-communities/reports/existing-bylaws.cfm?attr=28>

Ontario Ministry of Transportation. (2009). Green Commercial Vehicle Program. Accessed April 1st 2009.
<http://www.mto.gov.on.ca/english/trucks/programs/grants-trucks/index.shtml>

Schweitzer, L., Brodrick, C.-J. and Spivey, S.E. (2008). Truck driver environmental and energy attitudes-an exploratory analysis. Transportation Research Part D 13 (3) 141-150.

Sharma, P. and Share, M. (2001) Modeling vehicular exhausts—a review. Transportation Research, Part D 6(3) 179-198.

Stodolsky, F., Gaines, L. and Vyas, A.(2000). Analysis of Technology Options to Reduce the Fuel Consumption of Idling Trucks. Accessed Jan. 6th 2009.
<http://www.osti.gov/energycitations/servlets/purl/771201-W46BqD/native/771201.PDF>

Statistics Canada (2006a). Human Activity and the Environment: Annual Statistics Accessed October 5th 2008.
<http://www.statcan.ca/english/freepub/16-201-XIE/16-201-XIE2006000.pdf>

Statistics Canada (2006b). Human Activity and the Environment: Transportation. Accessed October 5th 2008.
<http://www.statcan.ca/Daily/English/061109/d061109b.htm>

Transport Canada (2003). Truck Activity in Canada –a profile. Ottawa. Accessed October 27th 2008.
<http://www.tc.gc.ca/pol/en/report/TruckActivity/Truck%20Activity%20in%20Canada.pdf>

Welford, R. (1997). Corporate Environmental Management. Systems and Strategies. Earthscan Publications. London.

Whitehead, B and Walley, N. (1994). It's not easy being green. Harvard Business Review 72(3) 46-52.