



Nova Scotia Idle-Less: A Compendium of Idling Reduction Options

One of the easiest actions that Canadians can take – with a simple turn of a key – is to avoid unnecessary idling. Idling is not only a waste of energy and money – after all, we’re burning fuel but going nowhere – it is also a needless source of greenhouse gas emissions. While reducing vehicle idling alone won’t solve the climate change problem, it’s a step in the right direction and it’s easy to do!¹

-Natural Resources Canada

Submitted by: TRAX, the Ecology Action Centre
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Executive Summary

When the Province of Nova Scotia adopted the *Environmental Goals and Sustainable Prosperity Act* in 2007, it made a commitment to reduce the province's greenhouse gas emissions 10 per cent below 1990 levels by the year 2020.² As 28.1 per cent of the province's greenhouse gas emissions can be attributed to the transportation sector, reducing emissions from this area must be a key component of any action plan.³ By eliminating needless idling, the province can reduce emissions, reduce energy use and reduce costs.

The Natural Resources Canada website states, "Motorists should keep in mind that idling for over 10 seconds still uses more fuel and produces more CO₂ than restarting your engine".⁴ The public seems to understand that idling is bad for the environment and bad for people, but fails to take strides towards changing this behaviour. A study by Lura Consulting highlights how, though 87 per cent of survey respondents believed that "...not idling their engine is the 'right thing to do,' most of them still participate in that behaviour."⁵ There is a disconnect between knowledge and action. This report outlines various options that the province, municipality and business can take to help reduce carbon emissions in the transportation sector. Before undergoing any project, the capacity of the unit that will be responsible for the activity must be realistically evaluated. Resources limitations must be accounted for. These will help determine which idling reduction option is feasible to undertake.

The report divides possible actions into five categories:

1. Education and Incentives which focuses on changing knowledge. All campaign efforts should include at least an element of education.
2. Policy which focuses on internal government or business practices ranging from vehicle purchasing policies to idling control policy.
3. Regulations which focus on how government can adopt legislation to change behaviour through a system of penalties.
4. Managing Traffic Flow which focuses on changes to the layout and design of intersections that will reap benefits in the long term.
5. Vehicle Efficiency which focuses on regulations that government can use to require vehicles to incorporate new idling-reduction equipment.

These options can be used in tandem for maximum energy and emissions savings.

To measure program success, it is imperative to take pre- and post-action measurements.

- 1 Natural Resources Canada. (2009). "Links between fuel consumption, climate change, our environment and health". Retrieved from <http://oee.nrcan-rncan.gc.ca/transportation/idling/health.cfm?attr=8> on August 1, 2009.
- 2 Province of Nova Scotia. (2007) *Environmental Goals and Prosperity Act*. Retrieved from http://www.gov.ns.ca/legislature/legc/bills/60th_1st/3rd_read/b146.htm on April 21, 2010.
- 3 Nova Scotia Department of Energy. (2009) *Toward a Greener Future: Nova Scotia's Climate Change Action Plan*. Retrieved from <http://www.gov.ns.ca/energy/resources/spps/energy-strategy/Climate-Change-Action-Plan-2009.pdf> on April 21, 2010.
- 4 Natural Resources Canada. (2009). "Idling- Frequently Asked Questions". Retrieved from <http://oee.nrcan-rncan.gc.ca/transportation/idling/faqs.cfm?attr=8> on August 3, 2009.
- 5 Lura Consulting (2003) *Towards an Idle-Free Zone in the City of Mississauga*. Retrieved from <http://www.tc.gc.ca/eng/programs/environment-utsp-towardsanidlefreezone-1076.htm> on April 3, 2010.

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1.0 Introduction

1.1 Transportation and the Environment

In Nova Scotia, the transportation sector contributes 28.1 per cent of the province's emissions.⁶ Of this amount, half can be attributed to the movement of goods and half to the movement of people. Across the world, emissions attributable to the transportation sector are increasing. This is despite the use of less carbon-intensive fuel sources. As a society we are simply driving more.

1.2 Why Idling is a Problem

Communities in Canada are becoming increasingly aware of the effects of vehicular idling, both on the health of their citizens and on the health of the environment. There is a general desire to reduce emissions - the public recognizes the negative effects of exhaust. Reducing idling by itself will not reduce emissions enough to "save the planet" but bringing idling to the fore does encourage residents to consider the impacts of their actions. Idling reduction campaigns, policies and regulations act as signposts of what behaviours are and are not acceptable within the community.

Three primary reasons for idling reductions exist: saving energy, saving the environment and saving the health of individuals. Natural Resources Canada promotes idling restriction on the basis of saving energy and energy-related expenses. The International Panel on Climate Change (IPCC) has linked carbon dioxide emissions with increased temperatures.⁷ It states, "Physical and biological systems on all continents and in most oceans are already being affected by recent climate changes, particularly regional temperature increases".⁸ Needless idling adds carbon emissions to the air which contributes to the greenhouse effect which in turn affects the climate. Health Canada promotes idling restriction based on decreasing emission levels and thereby decreasing particulate matter and other toxins. A staff report written by Toronto Public Health that reviews the idling control by-law in Toronto highlights the negative health-related aspects of idling.⁹ This corresponds with the stance of the Capital

6 Bernstein, Jonah for Climate Change Directorate, NS Environment (2009) Climate Change Action Plan. Retrieved from <http://www.gov.ns.ca/constructionportal/docs/ClimateChange.pdf> on April 19, 2010

7 Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E, International Panel on Climate Change (2007) Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. "Assessment of observed changes and responses in natural and managed systems". Cambridge University Press, Cambridge, United Kingdom, 1000 pp. Retrieved from <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter1.pdf> on February 21, 2010

8 Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E, International Panel on Climate Change (2007) Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. "Assessment of observed changes and responses in natural and managed systems". Cambridge University Press, Cambridge, United Kingdom, 1000 pp. Retrieved from <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter1.pdf> on February 21, 2010

9 Medical Officer of Health. (December 19, 2008). Reviewing the Idling Control By-law. Retrieved from www.toronto.ca/legdocs/mmis/2009/gm/bgrd/backgroundfile-18167.pdf on July 15, 2009.

Regional District in Victoria, British Columbia that promotes the idling restriction *By-law 3533* and gives the reason for the by-law as "...to promote Clean Air by Regulating Motor Vehicle Idling".¹⁰ Whether you side with Natural Resources Canada, IPCC or Health Canada about the reason for decreasing idling, the need itself is agreed upon.

Idling is customary. Documentation from County Grey, Ontario states that "... most fuel-injected engines today require only 30 seconds to one minute of running time to circulate fluids to get ready to drive even in winter conditions."¹¹ The Natural Resources Canada website states, "Motorists should keep in mind that idling for over 10 seconds still uses more fuel and produces more CO₂ than restarting your engine".¹² Natural Resources Canada recommends idling for no more than one minute in order to decrease emissions. Some car mechanics may argue that the "puff" of emissions when a vehicle starts counteracts some of the savings of turning your vehicle off. This is documented only for older, non fuel-injected vehicles.

1.3 Context

According to a health index report developed by Human Resources and Skills Development Canada, the activities of Canadians generated 22.96 tonnes of carbon dioxide per capita in 2002.¹³ The exact figure is hard to quantify - different reports use different numbers:

- Natural Resources Canada gave per capita carbon emissions as 22.84 tonnes in 1998.¹⁴
- The Netherlands Environmental Assessment Agency measured Canadian carbon emissions at 17 tonnes per capita in 2008.¹⁵
- The Union of Concerned Scientists stated Canada's per capita emissions were 19.11 tonnes per person (18 tons) in 2006.¹⁶

Whatever the exact figure, the fact remains that Canadians are using petroleum products at a rate that is unsustainable.

10 Capital Regional District. (April 8, 2009). Staff Report to the Capital Regional District Board. Pg. 1. Retrieved from http://www.crd.bc.ca/agendas/capitalregionaldistr_/2009_/apr8/Apr8.pdf on July 15, 2009.

11 Transportation and Public Safety Department. (May 5, 2009). Idling Policy. Pg.2. Retrieved from <http://www.greycounty.ca/files/pagecontent/policy-roads-02-07-amended-idl.pdf> on July 15, 2009.

12 Natural Resources Canada. (2009). "Idling - Frequently Asked Questions". Retrieved from <http://oee.nrcan-rncan.gc.ca/transportation/idling/faqs.cfm?attr=8> on August 3, 2009.

13 Human Resources and Skills Development Canada. (August 20, 2009). Greenhouse Gas Emissions Per Person. Indicators of Well-being in Canada. Retrieved from http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=64#M_2 on August 20, 2009.

14 Natural Resources Canada. (November 5, 2003). The Atlas of Canada. Greenhouse Gas Emissions by Gas 1998. Retrieved from <http://atlas.nrcan.gc.ca/site/english/maps/climatechange/atmospherestress/greenhousegasemissionbygas> on August 20, 2009.

15 Netherlands Environmental Assessment Agency. (June 25, 2009). Global CO₂ emissions: annual increase halves in 2008. Retrieved from <http://www.pbl.nl/en/publications/2009/Global-CO2-emissions-annual-increase-halves-in-2008.html> on August 20, 2009.

16 Union of Concerned Scientists: Citizens and Scientists for Environmental Solutions. (2009). Each Country's Share of CO₂ Emissions. Global Warming. Retrieved from http://www.ucsusa.org/global_warming/science_and_impacts/science/each-countrys-share-of-co2.html on August 20, 2009.

1.4 Commitments

When the *British North America Act* was drafted in 1867, the environment was not listed within either the jurisdictional powers of provinces or the federal government. In plain language, neither Nova Scotia nor Canada has exclusive jurisdiction over air quality. This means that both are responsible for ensuring that the population has clean air to breathe.

1.4.1 National

The federal government has been involved in a series of commitments to international treaties. It has also been involved in a series of gaffes. On April 29, 1998, Canada ratified the Kyoto Agreement and made a further commitment to reducing greenhouse gas emissions six per cent below 1990 levels rather than the requisite five per cent. That was under a Liberal government; governments change and so too did the commitment to climate change strategies.

A timeline produced by CBC recounts:

On March 31, 2006, Environment Minister Rona Ambrose told a Vancouver audience that since ratifying Kyoto, Canada's 'greenhouse gas emissions are up by 24 per cent' – a far cry from the previous government's commitment to meet a target six per cent below the 1990 levels.¹⁷

As a nation Canada's greenhouse gas emissions are rising rather than decreasing. The Kyoto targets are outside of Canada's reach. The current federal government had proposed a *Clean Air Act* that if passed would have gone into effect January 2010. Unfortunately, the bill didn't make it past second reading. CBC states that as of February 8, 2007:

Environment Minister John Baird announced plans to introduce legislation that would regulate industrial pollutants. Baird also said Canada will not attempt to meet Kyoto's greenhouse gas targets.¹⁸

The Conservative Government has not proposed any legislation to replace the *Clean Air Act*.

The federal government says it has a plan to reduce greenhouse gas emissions. Environment Canada writes:

The Government is committed to drastically reducing Canada's greenhouse gas emissions and air pollution as set out in its *Turning the Corner Plan*. With the *Turning the Corner Plan* the Government of Canada is putting into place one of the toughest regulatory regimes in the world to meet its target of reducing greenhouse

17 CBC. Kyoto and Beyond: Canada-Kyoto timeline. Retrieved from <http://www.cbc.ca/news/background/kyoto/timeline.html> on August 19, 2009

18 CBC. Kyoto and Beyond: Canada-Kyoto timeline. Retrieved from <http://www.cbc.ca/news/background/kyoto/timeline.html> on August 19, 2009

gases an absolute 20 per cent from 2006 [levels] by 2020.¹⁹

The Pembina Institute questions the federal government's commitment to adopting strict regulations. A number of loopholes exist within the *Turning the Corner Plan* that mean that industry doesn't need to act until 2018. The Institute writes:

The decision to "backload" the bulk of emission reductions to 2018 and later is highly questionable for a government that says it's on track to meet a national GHG target in 2020 - albeit one that falls far short of what the science calls for from a developed country.²⁰

As was demonstrated during Copenhagen 2009, whether a plan is stringent enough is usually dependent on who is asking.

1.4.2 Provincial

In 2007, the Province of Nova Scotia committed to fostering ecological well-being with the passing of the *Environmental Goals and Sustainable Prosperity Act* (EGSPA). Nova Scotia has committed to becoming a recognized leader in balancing the needs of its citizens in both the environmental and economic realms. Nova Scotia recognizes that economic and social prosperity comes through environmental health. In Section 4 of the Act, clause 2 e) outlines one of the primary goals of the Act, "...greenhouse gas emissions will be at least 10 per cent below the levels that were emitted in the year 1990 by the year 2020..."²¹ Guidance for achieving these goals is provided through the shorter-term objectives outlined in *Toward a Greener Future: Nova Scotia's Climate Change Action Plan*.²² It is critical that any government elected works to achieve these goals.

Despite its laudable intentions, the Province struggles to implement the policies and procedures it has committed to. The struggle is chiefly due to financial and other resource constraints. However, measures the province has undertaken include:

- Environmental purchasing policies
- Green Fleet policies
- Employee trip reduction programs
- Improvements to public transit
- Land-use planning regulations to reduce sprawl and support transit, walking and cycling
- Energy-efficiency and energy-conservation strategies
- Green power programs
- Activities to reduce the urban heat island effect including green

19 Environment Canada. *Turning the Corner: Canada's plan to reduce greenhouse gas emissions and air pollution*. Retrieved from <http://www.ec.gc.ca/cc/default.asp?lang=En&n=A3CB096D-1> on August 19, 2009

20 Demerse, Clare. Pembina Institute (March 26, 2008). *Canada's Industry Regulations: Not "Turning the Corner" Anytime Soon*. Retrieved from <http://www.pembina.org/op-ed/1617> on February 21, 2010.

21 Government of Nova Scotia. *Environmental Goals and Sustainable Prosperity Act (2007)* retrieved from http://www.gov.ns.ca/legislature/legc/bills/60th_1st/1st_read/b146.htm on August 19, 2009

22 Province of Nova Scotia. (January 2009). *Toward a Greener Future: Nova Scotia's Climate Change Action Plan*. Retrieved from <http://climatechange.gov.ns.ca/doc/ccap.pdf> on August 20, 2009.

space enhancement.²³

These measures will not be discussed within this document, but will be included in future work.

1.4.3 Municipal

Municipalities play a role in ensuring the well-being of citizens. As creatures of the province, municipalities have been given the power to regulate for the health of their citizens. The *Municipal Government Act* outlines the purpose of municipalities in Section 2. In this section, clause C states:

- (c)... that the functions of the municipality are to
 - (i) provide good government,
 - (ii) provide services, facilities and other things that, in the opinion of the council, are necessary or desirable for all or part of the municipality, and
 - (iii) develop and maintain safe and viable communities.²⁴

It would be difficult to argue that protecting air quality is not a measure that falls under working to benefit the health of the population. Section 2 seems to give broad authority to Council to act in a manner that is consistent with ecologically sound principles.

A municipality has the authority to adopt a by-law, policy or other regulation to ensure the well-being of its citizens. The City of Toronto has set a CO₂ reduction target of 20 per cent based on an emissions baseline of approximately 27,000,000 tonnes in 1990 as calculated by the Air Quality Improvement Branch of Works and Emergency Services. The 20 per cent target was originally set by the former City of Toronto and was then re-adopted by the amalgamated City of Toronto in December 1998.²⁵ A community must be prepared for any new by-law, change in enforcement patterns, or any policy changes. People tend to resist change, but if they understand why a change is necessary, they are much more likely to accept it.

Despite the fact that HRM does not have a delegated mandate to manage air quality, which is the responsibility of the federal and provincial governments, it has a responsibility to its residents to ensure that the environment in which they live is clean and does not pose a threat to their well-being.²⁶ An example of how HRM is achieving good air quality is the establishment of an integrated airshed management program. As an integrated program,

23 Penney, J. (2005). "Situational Analysis: The Status of Anti-idling By-laws in Canada" Clean Air Partnership. Retrieved from http://www.cleanairpartnership.org/pdf/situational_analysis_0405.pdf on August 3, 2009.

24 Province of Nova Scotia. (1998). Municipal Government Act. Section 2. Retrieved from <http://www.gov.ns.ca/legislature/legc/statutes/muncpgov.htm> on August 16, 2009.

25 City of Toronto . Green Fleet Transition Plan 2004-2007. P. 9 Retrieved from http://www.toronto.ca/fleet/pdf/gftp_apr04.pdf on August 18, 2009.

26 Jacques Whitford (April 2006). Clean Air Strategy Framework Document: Executive Summary. P. 1. Retrieved from <http://www.halifax.ca/environment/documents/CleanAirStrategy-ExecutiveSummary.pdf> on August 20, 2009.

the province is also involved. The Nova Scotia Department of Environment and Labour has proposed leading an airshed management initiative that will bring parties together in a collaborative forum in order to better manage the airshed of which HRM is a part. ²⁷

²⁷ Jacques Whitford (April 2006). Clean Air Strategy Framework Document: Executive Summary. P. 2. Retrieved from <http://www.halifax.ca/environment/documents/CleanAirStrategy-ExecutiveSummary.pdf> on August 20, 2009.

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Capital Regional District. (April 8, 2009). Staff Report to the Capital Regional District Board. Retrieved from <http://www.crd.bc.ca/agendas/capitalregionaldistr /2009 /apr8/Apr8.pdf> on July 15, 2009.

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Demerse, Clare. Pembina Institute (March 26, 2008) Canada's Industry Regulations: Not "Turning the Corner" Anytime Soon. Retrieved from <http://www.pembina.org/op-ed/1617> on February 21, 2010.

Environment Canada. Turning the Corner: Canada's Plan to Reduce Greenhouse Gas Emissions and Air Pollution. Retrieved from <http://www.ec.gc.ca/cc/default.asp?lang=En&n=A3CB096D-1> on August 19, 2009.

Government of Nova Scotia. *Environmental Goals and Sustainable Prosperity Act* (2007) Retrieved from http://www.gov.ns.ca/legislature/legc/bills/60th_1st/1st_read/b146.htm on August 19, 2009.

Human Resources and Skills Development Canada. (August 20, 2009). Greenhouse Gas Emissions Per Person. Indicators of Well-being in Canada. Retrieved from http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=64#M_2 on August 20, 2009.

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Netherlands Environmental Assessment Agency. (June 25, 2009). Global CO2 Emissions: Annual Increase Halves in 2008. Retrieved from <http://www.pbl.nl/en/publications/2009/Global-CO2-emissions-annual-increase-halves-in-2008.html> on August 20, 2009.

Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E, International Panel on Climate Change (2007) Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. "Assessment of observed changes and responses in natural and managed systems". Cambridge University Press, Cambridge, United Kingdom, Retrieved from <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter1.pdf> on February 21, 2010.

Penney, J. (2005). "Situational Analysis: The Status of Anti-idling By-laws in Canada" Clean Air Partnership. Retrieved from http://www.cleanairpartnership.org/pdf/situational_analysis_0405.pdf on August 3, 2009.

Province of Nova Scotia. (1998). *Municipal Government Act*. Section 2. Retrieved from <http://www.gov.ns.ca/legislature/legc/statutes/muncpgov.htm> on August 16, 2009.

Province of Nova Scotia. (January 2009). *Toward a Greener Future: Nova Scotia's Climate Change Action Plan*. Retrieved from <http://climatechange.gov.ns.ca/doc/ccap.pdf> on August 20, 2009.

Transportation and Public Safety Department. (May 5, 2009). *Idling Policy*. Retrieved from <http://www.greycounty.ca/files/pagecontent/policy-roads-02-07-amended-idl.pdf> on July 15, 2009.

Union of Concerned Scientists: Citizens and Scientists for Environmental Solutions. (2009) *Each Country's Share of CO2 Emissions. Global Warming*. Retrieved from http://www.ucsusa.org/global_warming/science_and_impacts/science/each-countrys-share-of-co2.html on August 20, 2009.

Jacques Whitford. (April 2006). *Clean Air Strategy Framework Document: Executive Summary*. Retrieved from <http://www.halifax.ca/environment/documents/CleanAirStrategy-ExecutiveSummary.pdf> on August 20, 2009.

2.0 Education and Incentives

2.1 Introduction

Education campaigns often focus on delivering “the truth” to people. There is a general belief, even if it is somewhat mistaken, that if people know what their behaviour is really doing they will be motivated enough to change that behaviour. Unfortunately, this does not seem to be the case, at least not in the case of idling. An article from Canwest News Service published on June 25, 2008 reminds the reader that, “...drivers’ behaviours often seem to contradict their attitudes with respect to vehicle idling”.²⁸ A 2003 study by Lura Consulting supports this. The study highlights how, though 87 per cent of respondents believed that “... not idling their engine is the ‘right thing to do,’ most of them still participate in that behaviour”.²⁹ Although drivers are cognizant of the fact that driving is harmful, they still continue with the practice. At first the inconsistency may seem odd but if one is to reflect on his or her own behaviour it is actually quite common. Though an individual knows that smoking is bad for her health, she still does it. Although an individual knows that it would be healthier to walk to work, he still drives. Change is often difficult and without the proper incentives, education campaigns are likely to be ineffective.

In an article titled *Fleet conversion in local government: Determinants of driver fuel choice for bi-fuel vehicles*, Johns *et al.*, look at why individuals use alternative fuel. It explains how knowledge of the fact that alternative fuels are better for the environment is not enough of an incentive to change behaviour. Johns *et al.* state:

Findings show that environmental attitudes do not have a significant effect on actual or perceived use; however, external variables such as fuelling convenience, vehicle performance, and the extent of informal communication significantly affect the driver’s likelihood of using alternative fuel.³⁰

Though education campaigns are necessary, they often must be accompanied by an incentive to act.

2.2 Context

Respondents to a Natural Resources Canada survey were asked, “How long can you idle your engine before you’d use more gas than if you turned it off when parked and then restarted it later?” On average, participants believed that they could idle their vehicle for three minutes before they began using more fuel than would be used in restarting. Further, fully 30 per cent of respondents believed that they could idle their engine for five minutes or longer before it

28 Canwest News Services (June 25, 2008) Most drivers think idling uses less gas: survey. Retrieved from <http://www.driving.ca/news/story.html?id=5b1372b7-668b-4317-b7cd-0f12f0993339> on April 3, 2010.

29 Lura Consulting (2003) Towards an Idle-Free Zone in the City of Mississauga. Retrieved from <http://www.tc.gc.ca/eng/programs/environment-utsp-towardsanidlefreezone-1076.htm> on April 3, 2010.

30 Johns, K., Khovanova, K., and Welch, E. (2009). Fleet conversion in local government: Determinants of driver fuel choice for bi-fuel vehicles. *Environment and Behavior*, 41(3), 402-426.

was more efficient to turn it off. Only six per cent of participants answered 10 seconds or less - the length of time that Natural Resources Canada has determined to be the cut-off for turning off an engine. ... Only 39 per cent of respondents moderately or strongly disagreed with this statement, indicating that they understood that it was more fuel efficient to turn their vehicle off. Further, only 38 per cent believe that it does not hurt the starter to turn the vehicle on and off more frequently.³¹ However, many people do believe that air pollution from idling is a problem.

Concerns about air quality are strongest among certain sectors of the population. So, if a conventional idling reduction campaign were to occur it would likely achieve the greatest results with:

- Older people
- Females
- Families with health problems related to air quality
- Those in urban areas³²

When designing an education campaign it is important to remember who your audience is and what incentives would help them to change their behaviour.

For more information about the incorrect idling beliefs held by the Canadian public, please visit Transport Canada at <http://www.tc.gc.ca/eng/programs/environment-utsp-towardsanidlefreezone-1076.htm>.

2.3 Incentives to Act

Explanation

As mentioned in the introduction, numerous behaviour change theories focus on the effect that information has on an individual's actions. Recognizing the effect that what they do or fail to do has on themselves, other people and the environment will motivate people to act differently. In this way, information campaigns can initiate positive behaviours among the target audience. Catherine Ray, a senior bureaucrat with Natural Resources Canada, who has researched idling for over 10 years, believes that a shift in behaviour will occur, "...once people understand the impact of their driving habits and the importance of shutting off an engine on a car that is parked for more than 60 seconds".³³ The exact time for acceptable idling is debatable, but the message that Ray adheres to is that information will induce a shift in behaviour.

31 National Resources Canada. Residential Idling Survey Report Retrieved from <http://oee.nrcan.gc.ca/transportation/idling/material/reports-research/sudbury-survey-report.cfm?attr=28> on April 2, 2010

32 PRR, Inc. (2003) DOE Idling survey summary report. Retrieved from http://74.125.93.132/search?q=cache%3Azpe8uiLgbYJ%3Awww.airwatchnorthwest.org%2Fwa%2FNO_IDLE%2FPDFs%2FIdling_Survey_Results.pdf+DOE+Idling+survey+summary+report&hl=en&gl=ca on April 3, 2010.

33 Canwest News Services (2008) Most drivers think idling uses less gas: survey. Retrieved from <http://www.driving.ca/news/story.html?id=5b1372b7-668b-4317-b7cd-0f12f0993339> on April 3, 2010.

This logic is supported by the work of Carric *et al.*, that states, “Based on earlier research to the effect of information on idling behaviour, we have reason to believe that misinformation is a primary cause of unnecessary idling”.³⁴ Providing individuals in the community with correct information will allow them to make the “right” decisions about when to turn off their vehicles.

However, Gardner and Stern point out that information alone is an insufficient reason for changing a behaviour. In their article *The Short List*, they state:

But information alone...is not enough to induce behaviour change, especially for many efficiency increases that involve significant initial monetary costs. There are major barriers to change, in addition to knowledge, which must be overcome, even among people who know which actions to take and would like to take them.³⁵

Following their thinking, education is only one step in shifting behaviour.

Theorists on human behaviour, such as Doug McKenzie-Mohr, hold firm to a belief that information itself is insufficient motivation for change. He suggests a Community-Based Social Marketing (CBSM) approach that in addition to information, offers incentives for behaviour change and focuses on eliminating barriers that could stand in the way of change. The Natural Resources Canada website discusses CBSM, stating:

This kind of marketing emphasizes direct, personal contact among community members and the removal of barriers (i.e., “roadblocks” to more sustainable actions and behaviours) since research suggests that such approaches are often most likely to bring about behavioural change.³⁶

According to this theory, though information is essential, it must be combined with other elements in order to initiate change.

Benefits

Documented evidence suggests the benefits of information campaigns include:

- Creating a more informed public
- Constructing a comprehensive, easy to manage campaign
- Maintaining a low-cost campaign

34 Carrico, Amanda R., Paul Padgett, Michael P. Vandenberg, Jonathan Gilligan, Kenneth A. Wallston. (2009) Costly myths: An analysis of idling beliefs and behaviour in personal motor vehicles. *Energy Policy* 37: 2881-2888.

35 Gardner, G.T., Stern, P.C., *The Short List: The Most Effective Actions U.S. Households Can Take to Curb Climate Change*, p. 22.

36 Natural Resources Canada (2009) An Overview of Community-Based Social Marketing Retrieved from http://oee.nrcan.gc.ca/communities-government/transportation/municipal-communities/what_you_can_do/socialMarketing.cfm?attr=28 on April 4, 2010.

Challenges

No drawbacks to an information campaign could be identified though the effectiveness of such a campaign in and of itself may be limited.

Examples

Numerous information-centred campaigns have been successfully carried out across the country. Looking to these campaigns for guidance can help prevent costly mistakes or oversights. Some examples include:

Eco-Kings, Nova Scotia

In order to have success at a higher level such as in implementing an idling restriction by-law, it is necessary to lay a strong foundation. Before the Town of Kentville, Nova Scotia enacted its idling restriction by-law, a two-year public relations campaign was undertaken. The Eco-Kings committee worked to inform the citizens of Kentville as to why idling is a problem before a by-law was ever mentioned.

Lura Consulting

Lura Consulting suggests a four-step process for influencing idling behaviour. These steps include³⁷:

- Stage 1: Build the Foundation
- Stage 2: Public Engagement I
- Stage 3: Public Engagement II
- Stage 4: Continuous Improvement

Lura maintains that in order to have a successful campaign it is important to evaluate successes at each stage and with each activity. More information about Lura Consulting's campaigns is available on the Natural Resources Canada website.

Ecodrive Program in the Netherlands

Having people choose by themselves not to idle is more effective than regulations, whether in the form of policy or legislation. The Ecodrive Program³⁸ in the Netherlands took a six-prong approach to driving more efficiently. The same type of approach could be used with Nova Scotian drivers to realize cost-effective results that also benefit the environment. The first year the Ecodrive Program was in place, a reduction of at least nine kilotons of carbon dioxide emissions could be attributed to the program. After the program had been in place for four years, the number increased to 97 kilotons. That is almost a 10-fold increase in emission savings.³⁹

37 Lura Consulting (2005) *The Carrot, the Stick and the Combo*. Retrieved from <http://oee.nrcan.gc.ca/communities-government/transportation/municipal-communities/research-reports.cfm?attr=28> on April 3, 2010.

38 Van den Hoed, Robert, Kirjam Harmelink and Suzanne Joosen. *Intelligent Energy Europe (2006) Evaluation of the Dutch Ecodrive Program*.

39 Van den Hoed, Robert, Kirjam Harmelink and Suzanne Joosen. *Intelligent Energy Europe (2006) Evalua-*

The six-pronged approach of the Ecodrive Program include⁴⁰:

- Encouraging Ecodrive driving style of (professional) drivers
- Integrating Ecodrive principles in driving school curriculum
- Training new drivers with ecodriving
- Stimulating in-car devices
- Facilitating optimal tire pressures
- Stimulating purchase of more efficient vehicles

Three of these are primarily education-based. Though education is emphasized, the program does realize that effective campaigns need to incorporate other elements, “The effectiveness of the communication campaign to reach efficiency improvements in driving can be assumed to be lower than getting drive style training”.⁴¹ Education must form the foundation of all campaigns though an effective campaign may depend on building upon this base.

Community Participation

Reduced idling within the municipal fleet will be much easier if the public is also engaged in controlling idling within their personal vehicle and idling becomes socially unacceptable in the community. Public awareness campaigns that have succeeded in communities across Canada shared the following features:

- Approval of an idling by-law
- Launch of a public information campaign that includes media releases and signage at key locations
- Regular enforcement blitzes that are supported by media campaigns
- School poster contests
- Challenges to fleet operators including utilities, transit, police and EMS, school buses, taxis, couriers, municipal contractors and private fleets⁴²

Ideally, several public sessions are held before an idling reduction campaign (or any campaign) gets underway, but in many instances this cannot occur. As identified in a research paper by McKenzie-Mohr, what must occur are the following five steps: careful selection of the behaviour(s) to be promoted; identification of the barriers and benefits to the behaviour; development of a strategy that addresses these barriers and benefits; pilot testing the strategy; and finally, broad scale implementation.⁴³ Examples of where social marketing has been used to affect behaviour change:

tion of the Dutch Ecodrive Program. “Net impact” P23.

40 Van den Hoed, Robert, Kirjam Harmelink and Suzanne Joosen. Intelligent Energy Europe (2006) Evaluation of the Dutch Ecodrive Program. “Specific actions in Ecodrive”P6.

41 Van den Hoed, Robert, Kirjam Harmelink and Suzanne Joosen. Intelligent Energy Europe (2006) Evaluation of the Dutch Ecodrive Program. “Net impact” P26.

42 Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: People Involvement. p. 48. Retrieved from: <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010.

43 Doug McKenzie-Mohr. (2008) Fostering Sustainable Behaviour: Beyond Brochures. Retrieved from http://www.ijsc-online.org/docs/artikel/03/3_07_IJSC_Practice_McKenzie.pdf on April 21, 2010.

Iowa City, Iowa

Iowa City engaged residents in a campaign to reduce their natural gas and electricity consumption. The campaign results state that, “At the end of the first month of the program, the results showed that participants who had made a public commitment had reduced their natural gas and electricity consumption by between 10 per cent and 20 per cent”.⁴⁴ The results are outstanding. As found in *Policy Studies Review Annual, Vol. 4*, the article described the program as involving a mixture of initial home visits and subsequent discussions:

... homeowners who received the public commitment manipulation showed a lower rate of increase in natural gas and electricity consumption than homeowners in either the private commitment or controlled conditions.⁴⁵

Results show that individuals making a private commitment are much less likely to follow through than those who make a public commitment. The public monitoring of the goal can be considered an incentive.

San Marcos, California

Using a system of door hangers portraying smiley faces, the campaign tracked the energy consumption of one Californian neighbourhood. The door hangers were distributed along with information materials detailing measures that could be taken to reduce energy use. The hangers encouraged households to keep up the good work of energy conservation or to stimulate a change in behaviour towards energy conservation. The program was moderately successful. Households that received a smiley face for energy conservation increased energy use but only slightly in comparison to those who did not receive a smiley face. While the households that received smiley faces increased energy use by one per cent, the families who received only information about energy conservation increased their use by 10 per cent. If the second group is considered to be a baseline measure, the smiley faces were successful. Though the incentive was small, even this level of recognition is helpful in stimulating certain behaviours.⁴⁶

2.4 Fleet Driver Re-education

Explanation

Professional drivers already know how to drive but may not be aware of the tactics they need to employ in order to drive in the most fuel-efficient way possible. Programs such as Natural Resources Canada’s *Fleet Smart* program work to give professional drivers the information needed to make more fuel-efficient driving choices.

44 Pallak, M.S., D.A. Cook and J.J. Sullivan (1980). “Commitment and Energy Conservation.” In L. Bickman (ed.), *Applied Social Psychology Annual* 235-253, Beverley Hills, CA: Sage.

45 Pallak, M.S., D.A. Cook and J.J. Sullivan (1980). “Commitment and Energy Conservation.” In B.H. Raven (ed.), *Policy Studies Review Annual, Volume* p. 358, Beverley Hills, CA: Sage.

46 Schultz P. W., Nolan J. M., Cialdini R. B., Goldstein N. J., Griskevicius Vladas (2007). The Constructive, Destructive, and Reconstructive Power of Social Norms. *Psychological Science*, 18(5), 429-434.

Benefits

Evidence suggests the benefits of targeted driver re-education and performance programs are much like those of education programs in general and include:

They have multiple benefits that range from reduced engine wear to lower fuel consumption to healthier drivers and a healthier community, all while reducing GHG emissions. They are an ideal way to start because of their ease of implementation and ability to demonstrate the numerous benefits of taking action on fleet operations.⁴⁷

Challenges

Fleet managers may need to overcome a number of roadblocks before willingly participating in a driver re-education and monitoring process. Some of these barriers may include:

Examples

Driver re-education is a delicate matter that must be handled with proper deference to the driver's existing skill set. Some places that have negotiated this are:

Repair Our Air Fleet Challenge, Ontario

Fleet Challenges give municipal vehicle operations as well as private citizens an opportunity to learn more about idling in a fun competitive manner.⁴⁸ The City of Toronto's *Green Fleet Transition Plan* lauds the *Fleet Challenge* for its ability to challenge municipalities so that they, "...work co-operatively on operational issues that impact the environment".⁴⁹

City of Seattle, WA

When beginning an idling reduction program, it is fundamental that basic measurements be taken so that the municipality or business can track its progress. The City of Seattle set the following targets to guide its progress:

Target: By the end of 2007, inform all employees who use City vehicles about:

The City's anti-idling policy

The importance of checking tire pressure regularly

Where to find alternative fuelling stations

Alternatives to driving; e.g., bike pool, bus passes for work,

47 BC Climate Action Toolkit. 2009. Retrieved from <http://www.toolkit.bc.ca/quick-starts-small-communities#localgovfleets> on September 19, 2009.

48 City of Toronto. Green Fleet Transition Plan 2004-2007. P. 15 Retrieved from http://www.toronto.ca/fleet/green_fleet_transition.htm on August 18, 2009.

49 City of Toronto . Green Fleet Transition Plan 2004-2007. P. 15 Retrieved from http://www.toronto.ca/fleet/green_fleet_transition.htm on August 18, 2009.

teleconferencing

Target: By the end of 2007, inform all departments that purchase vehicles about:

The City's right-size policy (or at least Resolution 30309)

The City's goal of a 100 per cent clean and green fleet.⁵⁰

The City views idling restriction measures as a fundamental part of their *Clean and Green Fleet* plan.

City of Edmonton, FleetSmart

Edmonton has committed to a program of driver re-education. In the first year of operation, the program saved the City \$205,000.⁵¹ This financial incentive could be passed along to fleet drivers, either directly or indirectly to help them stay with their commitments.

2.5 Fleet Challenges

Explanation

When a municipality's pride is on the line or when an individual has an incentive to drive in a more fuel-efficient way, the possibilities of change are multiplied. In a Fleet Challenge, the element of personal honour promotes awareness and growth. A challenge pits one community or business group against another. It also pits an individual's "new awareness" against the old.

A Challenge needs to incorporate driver education with driver monitoring and a reward system. Having one group of drivers within a fleet decrease their fuel use can motivate another group within the company to meet, and even surpass, the first group's achievement. This same sort of "call to arms" has successfully been used at a community-wide level.

Benefits

Evidence suggests the benefits of targeted driver re-education and performance programs are:

- Increasing efficiency with driving
- Decreasing idling
- Building camaraderie among team members

⁵⁰ Fleets and Facilities Department Officer of Sustainability and Environment. (2007). A Clean and Green Fleet: An Updated Action Plan for the City of Seattle. "Implementation of the Original Plan". Retrieved from http://www.seattle.gov/fleets/docs/ClnGrnFltPlan_Sea_07Update.pdf on November 14, 2009.

⁵¹ Natural Resources Canada (2009) FleetSmart Profiles: Municipalities and Utilities The City of Edmonton Retrieved from <http://fleetsmart.nrcan.gc.ca/index.cfm?fuseaction=docs.view&id=municipal-edmonton> on April 19, 2010.

Challenges

Fleet managers and drivers may need to overcome a number of roadblocks before willingly participating in a driver re-education and monitoring. Some of these barriers may include:

- Dissenting opinions among drivers who feel that they already have learned to drive and are not interested in changing their habits
- Waning support from union leadership
- Union officials may feel “their drivers” are being threatened
- Management may oppose activities that are part of the Challenge because they feel that the activities do not contribute to the operational efficiency of the unit.

Examples

Developing a Fleet Challenge program can aid in driver re-education without intimidation:

Repair Our Air (Fleet Challenge Ontario)

The *Repair Our Air-Fleet Challenge* (www.repairourair.org) provides a good blueprint of how to create behaviour change by actively engaging drivers in a competition to reduce idling incidents. Features of the *Challenge* include⁵²:

- Designing the Challenge in partnership with department supervisors
- Registering of departments on a voluntary basis
- Selecting vehicles to participate in the Challenge
- Installing telematics on all participating vehicles
- Launching the campaign with an information session on idling and on the Challenge
- Broadcasting weekly reports on idling incidents
- Celebrating successes at an awards ceremony
- Preparing a report that identifies how improved performance will be sustained

Following these points should help secure a successful Challenge.

The website repairourair.org is no longer functioning but information from the program is available through Fleet Challenge Ontario.

⁵² Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: People Involvement. p. 48. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010.

2.6 Commitments and Pledges

Explanation

Making a commitment to reduce idling, either publicly or privately, can help a campaign achieve success. A report published by the Australian Public Service Commission states that individuals try to achieve consistency between their actions and beliefs. A commitment to idling reduction uses this desire for consistency. If individuals believe that idling is a negative behaviour for environmental health, then their actions should reflect this. The Australian report states:

The cognitive consistency theory proposes that people are motivated to seek consistency between their beliefs, values and attitudes and their behaviours. This can be a powerful tool in certain circumstances where a commitment can be extracted from the individual to behave in a way that is consistent with their existing beliefs and attitudes.⁵³

An idling-reduction campaign can use this desire to its advantage. For the greatest impact, pledges should be made in a public form and pledgers should be reminded of their commitment.

Benefits

The benefits of employing commitments to reduce idling are:

- Using an existing human proclivity towards consistency
- Using a variety of commitment levels can appeal to every audience but even if individuals commit to a lower-than-ideal level, they are still making a commitment.
- Working on collecting commitments can integrate into larger campaigns and thus can increase both the breadth and intensity of the public outreach

Challenges

Approaching individuals can be difficult and there is the possibility of negative reactions.

Some challenges with approaching individuals for commitments include:

- Finding a time with individuals where they actually have time to sit down and discuss the issues
- Though most individuals desire congruency between belief and behaviour, in certain situations behaviour does not match stated beliefs. This is especially true in the case of environmental issues.⁵⁴
- Searching for convenience may replace operator concern and caution.

53 Australian Public Service Commission. (2007). Changing Behaviour: A public policy perspective. Retrieved from: www.apsc.gov.au/publications07/changingbehaviour4.htm on April 25, 2010.

54 Australian Public Service Commission. (2007). Changing Behaviour: A public policy perspective. Retrieved from: www.apsc.gov.au/publications07/changingbehaviour4.htm on April 25, 2010.

Examples

Vancouver Ambassadors, British Columbia

Any idling reduction campaign will need to include as many partner organizations as possible in order to increase the reach of program activities. Along with that, as many methods as possible to induce change within the community should be employed. As such, idling reduction commitments are only one part of a larger effort. They can be a very important part but must occur alongside other education campaign. In British Columbia, the two Vancouver Ambassadors worked to promote idling reduction through a variety of means. The ambassadors, “successfully influenced community members by collecting idle-free photo and web pledges; by partnering with car mechanics and other key message deliverers; and by getting the commitment of councils and fleets to adopt policies and install idle-free signs”⁵⁵. The pledges were one form of advocacy but only one among many.

⁵⁵ Freedman, Rebecca. (March 2009). Idle-Free Ambassador Program Evaluation
B.C. Air Action Plan Provincial Idle-Reduction Initiative.

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- Gardner, G.T., Stern, P.C., The Short List: The Most Effective Actions U.S. Households Can Take to Curb Climate Change.
- Idaho Department of Environmental Quality (2009) *How to Participate in the Clean Air Zone Idaho for Businesses Program*. Retrieved from http://www.deq.state.id.us/air/assist_business/clean_air_zone.cfm#how on August 16, 2009.
- Johns, K., Khovanova, K., & Welch, E. (2009). Fleet conversion in local government: Determinants of driver fuel choice for bi-fuel vehicles. *Environment and Behaviour*, 41(3), 402-426.
- Lura Consulting (2005) The Carrot, the Stick and the Combo. Retrieved from <http://oee.nrcan.gc.ca/communities-government/transportation/municipal-communities/research-reports.cfm?attr=28> on April 3, 2010.
- Lura Consulting (2003) Towards an Idle-Free Zone in the City of Mississauga. Retrieved from <http://www.tc.gc.ca/eng/programs/environment-utsp-towardsanidlefreezone-1076.htm> on April 3, 2010.
- Lura Consulting (2002) Anti-Idling campaign, final report. Retrieved from <http://oee.nrcan.gc.ca/transportation/idling/material/reports-research/nov-CPPI-final-report.cfm?attr=16> on April 3, 2010.

Motoda, Yoshitaka and Taniguchi, Masaaki (2003) A Study on Saving Fuel by Idling Stops While Driving Vehicles. Eastern Asia Society for Transportation Studies. http://webcache.googleusercontent.com/search?q=cache%3Arl9oIM_IEBkJ%3Awww.eccj.or.jp%2Fidstop%2Feng%2Fdpeasts3.pdf+A+Study+on+Saving+Fuel+by+Idling+Stops+While+Driving+Vehicles&hl=en&gl=ca on April 10, 2010

National Resources Canada. Residential Idling Survey Report. Retrieved from <http://oee.nrcan.gc.ca/transportation/idling/material/reports-research/sudbury-survey-report.cfm?attr=28> on April 2, 2010

PRR, Inc. (2003) DOE Idling survey summary report. Retrieved from http://74.125.93.132/search?q=cache%3AzZpe8uiLgbYJ%3Awww.airwatchnorthwest.org%2Fwa%2FNO_IDLE%2FPDFs%2FIdling_Survey_Results.pdf+DOE+Idling+survey+summary+report&hl=en&gl=ca on April 3, 2010.

Repair Our Air Fleet Challenge (2009) Retrieved on August 17, 2009 from Van den Hoed, Robert, Kirjam Harmelink and Suzanne Joosen for Intelligent Energy Europe (2006). Evaluation of the Dutch Ecodrives Program.

3.0 Policy

3.1 Introduction

Any company or government agency that has its own fleet of vehicles, or employees that use their own vehicles on company business, can demand that idling reduction policies be adhered to. These agencies also have the opportunity to reduce emissions by controlling the type of vehicles used in addition to controlling the duration of these vehicles' use. Together these two components form the foundation for vigorous idling restriction policy.⁵⁶

3.2 Context

Knowledge deficits around idling have been identified with private vehicle drivers. The same drivers who were interviewed as members of the general public are the same individuals who form the work force of government and private industry. Therefore, it is reasonable to conclude that the same knowledge gaps that have been identified for private citizens exist among fleet drivers. The result of this supposition is that the same type of knowledge and education-based programs that are useful for the general public will also be useful for employees. For further details about the "misinformation" that individual drivers hold, please see the previous section on Education.

3.3 Direct Anti-Idling Policies

Corporate entities can adopt policies that their employees must adhere to. Monitoring and buy-in may be issues. However, in taking the step of enacting a policy, both internal and external parties can become aware that the entity in question is making an effort to curb greenhouse gas emissions. Whether the entity's campaign goes far enough or is successful cannot be determined in a simple way, but by establishing an idling reduction framework the corporation has recognized the importance of the issue.

3.3.1 Idling Control Policy

Explanation

As mentioned above, by adopting a policy that makes a clear statement about how idling a vehicle is unacceptable to a corporation, that corporation makes a point to both employees and to consumers. The *Repair Our Air* website states that 35 per cent of running time for corporate vehicles is spent idling.⁵⁷ Part of this time is when a vehicle idles in traffic, but a larger part of that time is simply when a driver fails to "turn the key" thereby leaving the

⁵⁶ Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: Considerations in Fuel Procurement p. 61. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010.

⁵⁷ Repair Our Air Fleet Challenge Retrieved from www.repairourair.org/the_challenge.html on August 17, 2009.

engine running. The repercussions of the needless idling are huge with air pollution being the biggest drawback.

Before a company engages in an idling reduction campaign, it should familiarize itself with where and how idling currently occurs. This may involve measuring exactly where and how idling is presently occurring. It is only with sufficient pre-test information that post-test measures are helpful.

Benefits

The benefits of a fleet-wide idling control policy are many. They include:

- Reducing fuel expenses for the company or government body
- Demonstrating to drivers what the actual cost savings are of turning off the engine
- Giving drivers positive reinforcement with public acknowledgement of their efforts
- Providing an opportunity for business/government to advertise its environmental prowess

Challenges

The employees of a corporate or government entity may feel that an idling restriction policy means that central office is meddling in their private affairs. While a policy does put additional pressure on drivers, the scrutiny is warranted. The costs of idling are high financially, socially and environmentally.

Examples

Numerous corporate entities and governments recognize that, in the absence of an idling control by-law, a policy to restrict idling can be nearly as effective. Some examples of this type of policy are:

County Grey, Ontario

County Grey, Ontario implemented a policy for its municipality in 2009. The policy will impact internal drivers but the County hopes that the fuel-saving message will be disseminated to the entire public. The policy allows, "...the Corporation of the County of Grey [to] be a leader by remembering and instituting this policy both at work and within the community."⁵⁸ The cost savings outweigh any potential administrative detail.

City of Toronto, Ontario

Currently Natural Resources Canada recommends allowing one minute of idling before requiring engines to be shut down. However, research shows that it is more efficient to shut

58 Grey County. (2009). "Purpose" Idling Policy, Policy and Procedures. Retrieved from https://greydocs.greycounty.ca/ucm/groups/public/documents/greypolicies/gc_015672.pdf on October 11, 2009.

an engine off and restart it if the vehicle is to remain motionless for 10 seconds.⁵⁹ The City of Toronto has adopted the progressive measure of 10 seconds, “All City of Toronto employees are expected to follow the 10 second rule: if you’re stopped for 10 seconds, turn off your vehicle. If all drivers do this, we will reduce CO2 emissions in Toronto by 2,147 tonnes per year. That’s like taking 486 passenger cars off the road annually”.⁶⁰ Along with the 10-second rule, the policy gives guidelines regarding vehicle warm-up times. These guidelines may be found at <http://www.toronto.ca/fleet/idle-free.htm>

City of Hamilton, Ontario

The City of Hamilton, Ontario chose to adopt an idling restriction policy rather than implement an idling control by-law. The policy may adequately change behaviour or it may be a precursor to a full by-law. The policy statement Hamilton adopted is strict, allowing vehicles to idle for only 10 seconds before they are in violation. The rationale for this is stated as:

Air quality, climate change and energy conservation discussions are becoming increasingly common among all levels of government. One issue that incorporates all three concerns is unnecessary vehicle idling. It is recognized that contaminants from vehicle exhaust are a major contributor to deteriorating air quality and climate change. In addition, these contaminants are linked to significant respiratory health effects. The City has made a strategic commitment to improve air quality. One specific initiative is an Idling Control Policy and an Idling Awareness Campaign. The campaign features social change through education and promotion. The City employees/vehicles should lead by example.⁶¹

The rationale for the policy encompasses environmental and health reasoning.

Zions Banks, Utah.

Recognizing that many of its customers use drive-through bank tellers, rather than ask people to alter the way they do their banking, Zions bank in Utah merely asks customers to turn off their vehicles engine for the duration of their banking transactions. The bank has installed large signs at the outdoor tellers to remind customers to turn their engines off.⁶²

59 City of Toronto. Fleet Services Policy, Idle-Free Policy (2007). Retrieved from <http://www.toronto.ca/fleet/pdf/idling-policy.pdf> on April 1, 2010.

60 Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: Creating a Clear Shared Vision. p. 47. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010.

61 City of Hamilton (2005) Green Fleet Implementation Plan: Schedule 6 – Idling Policy for Employees Operating City Vehicles p36. Retrieved from <http://www.hamilton.ca/NR/rdonlyres/45DA2BA5-3877-4048-9535-4E3615E0F38E/0/GreenFleetImplementationPlan.pdf> on April 5, 2010.

62 Drivethru lies. (May 25, 2009). Drive-thru Banking To curb smog, banks ask customers to cut engines. Retrieved from <http://drivethrulies.wordpress.com/2009/05/25/to-curb-smog-banks-ask-customers-to-cut-engines-2/> on August 16, 2009.

3.4 Indirect Measures

Idling reductions can occur directly through idling restriction policy or reductions in emissions can come through other means to reduce the intensity of carbon fuel use. These may include vehicle “right-sizing” policy or switching to less carbon intensive fuels.

3.4.1 Right-Sizing Fleets

Explanation

“Right-sizing” a fleet means that fuel efficiency and job requirements are both considered when purchasing a vehicle. It means that choosing a vehicle considers:

- The function that a specific vehicle is used for 90 per cent of the time
- Fuel efficiency as measured against other vehicles in a certain class

With these two considerations, the most appropriate vehicle is chosen without sacrificing environmental standards. The use of a “90 per cent” factor recognizes that there will be exceptional circumstances where a vehicle will not be able to perform a certain task. In these instances, it is usually economically advantageous to rent or borrow a vehicle that is more appropriate for the given task.

Formulas are used to factor lifetime expenses and initial purchasing price in making decisions about which vehicles to acquire. See Appendix C for additional details.

Benefits

The benefits of fleet right-sizing are many. They include:

- Matching carbon emission levels to the task at hand. Fuel isn’t wasted running engines that are bigger than necessary
- Saving fuel over the life of a vehicle
- Analyzing lifetime costs in determining which vehicle to purchase
- Using an appropriate policy tool removes guess work from purchasing decisions

Challenges

Fleet right-sizing policies have few identifiable drawbacks. One exception to this may be that a fleet manager does not get to purchase a vehicle that has performed well in the past if the quantifiable evidence does not substantiate this decision. Qualitative perspectives are not granted much weight with purchasing formulas.

Examples

Different levels of government as well as business enterprises recognize the fuel efficiency savings that result from using a vehicle that is properly sized for the task it will be completing.

Two examples of right-sizing policy policies include:

Halifax Regional Municipality, Nova Scotia

On July 7, 2009, HRM Regional Council both made and carried a motion to adopt a green “filter” for the purchasing of new fleet vehicles. The filter includes a right-sizing component as well as a life cycle cost analysis.⁶³ See Appendix C for details.

Province of Nova Scotia

In the *Common Services Manual*, the Treasury Board of Nova Scotia outlines the sustainable procurement policy as it pertains to vehicles. The Board outlines that it is important to consider the fuel efficiency of a vehicle as well as its use:

Vehicle Selection and Procurement (including purchase or lease):

Fuel efficiency and environmental impact must be key-decision making factors when procuring vehicles for government use. When choosing a vehicle, consideration must be given to the vehicle’s intended uses and the proportion of time it will be needed for such uses. Purchasers shall take into consideration that intermittent transportation needs can be met through rental and sharing of pooled vehicles. Of the Purchasing Specifications for Nova Scotia Government Vehicles, only those that meet or exceed the air pollution and fuel efficiency thresholds will be selected for purchase or lease by the Nova Scotia Government. Vehicles listed are those that represent the top 20 per cent of their class in terms of fuel efficiency.⁶⁴

By specifying the exact policy departments adhere to with their purchasing, the government can help to control both capital and operating expenditures as well as greenhouse gas emissions.

By selecting fuel-efficient vehicles, any time spent idling will release fewer greenhouse gas emissions than if less fuel-efficient vehicles were used. When vehicle right-sizing is combined with idling restriction policies and driver retraining, the most efficient fuel savings can be realized.

3.4.2 Alternative Fuels

Explanation

Petroleum is the most common fuel for vehicles in North America. However, an increasing mix of alternative fuels is being used both for their cost advantage and for their greenhouse gas emission advantage. Vehicles are no longer exclusively designed to run on standard

⁶³ Halifax Regional Municipality (July,7 2009)Meeting Minutes. Halifax Regional Council. Retrieved from <http://www.halifax.ca/council/documents/c090707.pdf> on April 19, 2010.

⁶⁴ Province of Nova Scotia. Common Services Manual (August 26. 2007). Section 7.2 Vehicle Policy. Retrieved from <http://www.gov.ns.ca/treasuryboard/manuals/PDF/300/30702-03.pdf> on April 2, 2010.

petroleum - flex fuel vehicles, natural gas engines, propane conversions, and electric vehicles are all becoming increasingly common. The engineering of these alternative-fuelled vehicles is safe and no more complex than for regular gasoline. What is an issue is alternative fuel availability.

While switching to alternative fuels is not an idling reduction measure *per se*, because alternative fuels often are less carbon intensive than is gasoline, fewer greenhouse gas emissions occur when these types of vehicles are in use. This means that while idling at traffic lights or while idling for “other acceptable reasons” the environmental damage is reduced.

Benefits

Alternative fuel technology is often more expensive than straight gasoline because many vehicles need to be converted after factory production. Even if this is the case, lifetime fuel savings can reduce or eliminate additional expenses. Other benefits include:

- Saving greenhouse gas emissions. Before this claim can be made of all alternative fuels careful research may need to be completed. Ethanol, for example, looks like a great renewable alternative, but because of the conversion process for cellulosic ethanol the carbon footprint of the fuel may actually be greater than that of petroleum. The same holds true for biodiesel. If the fuel is made from waste products it certainly is less carbon intensive than regular diesel, but if food crops are being used to produce the fuel other social and environmental issues arise.

Challenges

Some considerations when looking at alternative fuels include:

- Converting engine to running on alternative fuel and purchasing fuel tanks
- Finding alternative fuels locally

Examples

Individual enterprises have converted to various fuels. Some examples include:

Communities in British Columbia

In the BC Climate Action Toolkit, the government lays out a logical plan by which to implement programs for alternative fuels. It states:

Local governments often convert from traditional gasoline and diesel to less GHG intensive fuels as a first step. Biodiesel is by far the most popular and easiest to implement. B20 biodiesel releases 16 per cent less GHG emissions than petroleum diesel. The modifications required to make the switch, if any, are usually straightforward and inexpensive. Getting more comfortable with

using a mixture of fuels rather than relying on traditional petroleum is a step towards carbon neutrality. It is important to check that the biodiesel is coming from waste grease, and not food crops. Local governments tend to look at the opportunities around these fuels, and then develop a staged implementation that, for example, starts with B5 biodiesel and moves to B10 and B20.⁶⁵

This statement outlines both procedure and rationale; both are prerequisites for adopting an alternative fuel policy.

Blue Line Transportation Ltd., Hamilton, Ontario

Individual businesses can also recognize the cost savings and energy reduction of switching to alternative fuels. In the 1980s, Hamilton's Blue Line Transportation Ltd. began converting its vehicles from standard gasoline to propane. At present, natural gas is the fuel of choice. The conversion has resulted in significant economic and environmental savings for the company.⁶⁶

3.4.3 Setting a Target

Explanation

Without a target, a campaign to reduce idling is like a ship without a rudder - it has no direction. In its plan to reduce greenhouse gas emissions from the transportation sector, the City of Vancouver states, "This recognized the importance of setting a target that would challenge the entire community to make real emission reductions. At the same time, the target had to be one that could be achieved through concerted and coordinated efforts."⁶⁷ The City recognizes the importance of setting a target, but it also recognizes that this target must be feasible. For the community to accept the target, the possibility of reaching that target must exist.

Fleet Challenge Ontario recognizes a similar need for goal setting. It states, "Management commitment is essential to the success of a reduced idling campaign. Developing the necessary commitment is best done in stages..."⁶⁸ Breaking the overall goal

65 BC Climate Action Toolkit. 2009. Retrieved from <http://www.toolkit.bc.ca/quick-starts-small-communities#localgovfleets> on September 19, 2009.

66 Natural Resources Canada. FleetSmart Profiles: Municipalities and Utilities Blue Line Transportation Ltd. – Hamilton, Ontario Taxi Fleet Achieves Fuel-Cost Savings With Alternative Fuels. Retrieved from <http://fleetsmart.nrcan.gc.ca/index.cfm?fuseaction=docs.view&id=municipal-blueline> on January 18, 2010

67 City of Vancouver Engineering Services and Sustainability Office (2007) Achieving Greenhouse Gas Reductions from Passenger Vehicles. Retrieved from <http://www.tac-atc.ca/english/resourcecentre/readingroom/conference/conf2005/docs/s17/klimchuk.pdf> on April 12, 2010

68 Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: Management Commitment. p. 47-48. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010

into reasonably achievable targets helps the larger task appear possible. Fleet Challenge Ontario recognizes that commitments are often solidified by a corporation or an individual's willingness to commit money to support a pledge, stating:

The level of management commitment will become evident when a budget is requested for the purchase or lease of telematics to measure idling incidence, and when direct participation in the idling campaign is requested. While reduced idling can provide a "quick win" for any Green Fleet program, note that the measurement and control of idling will require an initial capital outlay...⁶⁹

A lack of financial commitment often demonstrates that a promise to an ideal is vacuous.

Benefits

Setting a target allows an entity to measure progress towards its goal. Without knowing where you want to be, it is impossible to measure how far you've come.

Challenges

Having set a target the main challenge is measurement. A corporation or community first needs to identify where it is and then needs to commit to evaluating progress towards the goal at regular intervals. If these measurements show that progress is not occurring then that entity needs to be willing to change its approach to reducing emissions. The willingness to take a new course of action means that the entity needs to be flexible and adaptable.

Additional challenges may include:

- Getting all stakeholders playing from the same handbook
- Accounting for results. One individual should have the ultimate responsibility of collecting and reporting idling data.⁷⁰
- Supporting unions and other workers organizations. Monitoring idling often involves monitoring the entirety of an individual's actions and behaviours. Union officials may worry that this amounts to "police state" thinking.⁷¹

Examples

Moving towards a target requires you to first identify what that target is, the same is true for setting a goal for idling reduction. Some communities that have begun their journey include:

⁶⁹ Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: Management Commitment. p. 47-48. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010

⁷⁰ Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: Supporting Structures and Processes p. 47-48. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010

⁷¹ Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: Supporting Structures and Processes p. 47-48. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010

Town of Stratford, Prince Edward Island

In 2009, the Town of Stratford adopted a “Sustainability Decision Making Framework”. The Framework outlines a series of questions that aid in evaluating municipal decisions and projects. The framework ensures that the Town’s actions reflect its commitment to the four pillars of sustainability: social, cultural, economic and environmental.

Doug Deacon, Sustainable Economic Development Coordinator, says that using the framework was slow at first, but with time it became second nature. He continues, stating that “the decision making framework is really a more powerful tool than the vision statement and community sustainability framework. I personally think it is the strongest tool in our arsenal.” (Personal Communication, December 15, 2009)

One of the questions included in the Framework is “Does this proposal contribute to reducing greenhouse gas emissions? (energy consumption)”⁷² Having each move that Council considers taking evaluated by contribution to greenhouse gas emissions will likely result in more environmentally sustainable decision making. This sort of thinking would help reduce GHGs.

Halifax Regional Municipality, Nova Scotia

Halifax Regional Municipality has set aggressive targets for GHG reductions in the corporate sector. This means that internal operations and activities must be evaluated. HRM should be applauded for these efforts. At the same time, the Municipality should be criticized for failing to set a community-wide target. At present, the emission levels of HRM’s corporate fleet is known, but emission levels from idling for the entire community can only be guessed at.

3.4.4 Fleet Management and Vehicle Maintenance

Explanation

Proper fleet management does not directly impact idling. Fleet management involves vehicle monitoring, driver education and vehicle maintenance. However, all three components affect the amount and type of emissions released while a vehicle is engaged in limited but necessary idling.

According to Fleet Challenge Ontario: “Few fleet managers or drivers understand the extent of waste associated with unnecessary idling”.⁷³ Relying on data collected through *Repair Our Air*, an anti-idling campaign, Fleet Challenge Ontario states that the percentage of time during normal operations that the following types of vehicles spend idling are⁷⁴:

72 Town of Stratford (PEI) Sustainability Decision Making Framework p.4 Retrieved from http://www.townofstratford.ca/sites/default/files/site_files/files/Decision_Making_Framework.April08.pdf on Feb. 20, 2010

73 Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: Idling Reduction. p. 46. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010

74 Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline

- Municipal service fleets, 30 - 50 per cent
- Transit, 35 - 40 per cent
- Enforcement, 65 - 85 per cent
- Utilities, 30 - 75 per cent

Figures like this are appalling because of the amount of fuel used without purpose. Such fuel use, or misuse, is both an extraneous expense and a huge burden on the atmosphere.

Benefits

Proper fleet management and maintenance allows for:

- Monitoring of fleet vehicles and driving staff
- Knowing which vehicles and which drivers have a tendency to idle more than others, can identify potential trouble spots
- Maintaining proper vehicle maintenance can aid in dealing with routine situations before they become problems
- Measuring idling situations
- Reducing overall costs which can in time be returned to the program.⁷⁵
- Sustaining behavioural change and lower fuel costs through a change-management approach
- Reducing vehicle wear. Fleet Challenge Ontario writes:

Idling has several undesirable attributes, which include but are not limited to: impact on engine operating life, as one hour of engine idle is equivalent to two hours of driving and results in the more frequent servicing and replacement of spark plugs, fuel injectors, valve seats, and piston crowns; higher cost, through incurring an additional \$1.25 in vehicle maintenance for every \$1.00 of fuel consumed; and, reducing engine oil life by 75 per cent, from 600 engine hours to 150 engine hours.⁷⁶

Challenges

Adopting best practices for fleet vehicles may have a short term economic impact on maintenance costs but any additional expenses should be recouped in fuel savings.

and Diesel: Idling Reduction. p. 46. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010

⁷⁵ Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: Idling Reduction. p. 46-47. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010

⁷⁶ Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: Idling Reduction. p. 46. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010

Examples

Fleet Challenge Ontario

Fleet Challenge Ontario wants to encourage Ontarians to take measures to reduce vehicular fuel use. Fleet Challenge Ontario writes:

The single first best thing a fleet manager can do for the environment and to cut costs is to burn less fuel (i.e., encourage use of transportation alternatives, stop idling, perform regular preventative maintenance, among other options). The more a fleet can perform using less energy, the better off a fleet will be regardless of the type of fuel.⁷⁷

Following the lead of Fleet Challenge Ontario, Nova Scotia could realize significant fuel savings.

⁷⁷ Fleet Challenge Ontario. (2008). Best Practices Manual 2008: Reducing the Use of Gasoline and Diesel: Consideration for Fuel Procurement. p. 60. Retrieved from <http://www.fleetbusiness.com/pdf/FCOntario.pdf> on April 5, 2010

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- City of Vancouver Engineering Services and Sustainability Office (2007) Achieving Greenhouse Gas Reductions from Passenger Vehicles. Retrieved from <http://www.tac-atc.ca/english/resourcecentre/readingroom/conference/conf2005/docs/s17/klimchuk.pdf> on April 12, 2010
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- Fleets and Facilities Department Officer of Sustainability and Environment. (2007). A Clean and Green Fleet: An Updated Action Plan for the City of Seattle. “Implementation of the Original Plan”. Retrieved from <https://www.seattle.gov/environment/Documents/CleanGreenFleetAP.pdf> on November 14, 2009.
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Blue Line Transportation Ltd. – Hamilton, Ontario
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Province of Nova Scotia. Common Services Manual (August 26, 2007). Section 7.2 Vehicle Policy. Retrieved from <http://www.gov.ns.ca/treasuryboard/manuals/PDF/300/30702-03.pdf> on April 2, 2010

Repair Our Air Fleet Challenge Retrieved from www.repairourair.org/the_challenge.html on August 17, 2009

4.0 Regulation

4.1 Introduction

Regulation is the strongest means available to government to reduce idling. Whether at the provincial or municipal level, when legislation is enacted to reduce idling, it signals to the community that the behaviour being regulated is only acceptable within certain limits. By legislating idling restrictions, government emphasizes the importance of reducing energy consumption, the seriousness of climate change, and the desire to have healthy constituents. Idling restriction by-laws may encounter community opposition so it is important to first educate the public about why that specific behaviour is worthy of restriction.

It is also important that there are alternatives to the behaviour being regulated, in this case idling. People use drive-throughs for their comfort and convenience. Certain municipalities across Canada have chosen to limit the number of new drive-through facilities that can be built. If we make entering the restaurant just as quick and comfortable as snaking along the line in a running vehicle, then people will choose to go into the restaurant.

4.2 Context

Currently, no Canadian province has adopted idling restriction legislation - all idling reduction regulation has occurred at town or municipal level. As a health detriment, the air pollution caused by idling could be regulated at a municipal, provincial or federal level.

4.3 Idling Restriction By-laws

Explanation

In 2005, more than 20 communities in Ontario had adopted idling restriction by-laws.⁷⁸ By 2009, the number had increased to over 28.⁷⁹ More exciting than the increase in absolute numbers, is that a number of communities are revisiting their efforts and tightening the provisions of the by-laws themselves. These communities include Burlington and London. Ontario is not the only province whose towns and cities are adopting anti-idling by-laws. British Columbia, Alberta, and Nova Scotia have communities leading the charge for idling reduction. See Appendix B for a sample idling restriction by-law, and Appendix D for elements to consider when drafting a by-law.

⁷⁸ Clean Air Partnership (2005) Situational Analysis: The Status of Anti-idling By-laws in Canada P1 http://74.125.93.132/search?q=cache%3Arzcae9Fif3EJ%3Awww.cleanairpartnership.org%2Fsituational_analysis_0405.pdf+Situational+Analysis%3A+The+Status+of+Anti-idling+By-laws+in+Canada&hl=en&gl=ca on August 19, 2009

⁷⁹ City of Burlington (2009) An Update of the City's Idling Initiatives including a Review of the Idling Control By-law and a Strategy to Increase Levels of Enforcement, P 3. Retrieved from <http://cms.burlington.ca/Page2893.aspx> on November 3, 2009

Benefits

The benefits of a community or municipality-wide idling restriction by-law are many. They include:

- Reinforcing and strengthening public education campaigns working to restrict idling⁸⁰
- Legitimizing idling as a problem for both environmental and health reasons
- Attracting media attention
- Reducing community-wide energy use
- Reducing wear and tear on individual vehicle engines

Challenges

Some challenges about enacting idling-reduction by-laws include:

- Enforcing specific allowable idling time. An enforcement officer would need to time a possible offender. However, if an idling restriction by-law is enacted that does not permit any idling, this challenge is removed. Any vehicle that is idling is automatically in contravention of the by-law.

Examples

A number of Canadian municipalities either are looking to or have already enacted idling restriction by-laws. Some examples are:

Town of Kentville, Nova Scotia

Only one community in Nova Scotia has enacted an idling restriction by-law - the Town of Kentville. Kentville Town Councillor Eric Bolland explains (Personal communication, August 6, 2009) that the by-law came after at least two years of hard work. That effort was led by the Eco-Kings Action Team. The team is a collaboration between “the Municipality of the County of Kings, the Towns of Berwick, Kentville, and Wolfville with the Kings Community Economic Development Agency, Valley Waste Resource Management, Eastern Kings Chamber of Commerce, and Eastern Habitat Joint Ventures”.⁸¹ Bolland recounts how the by-law could only have occurred after the Action Team prepared the community through an education and awareness campaign.

A year and a half after the Town of Kentville adopted its *Idling Control By-law* on Sept. 23, 2008, the communities of Annapolis Royal and Antigonish are exploring the possibility of adopting idling restriction legislation.

80 Carrico, Amanda R. and Paul Padgett, Michael P. Vandenberg, Jonathan Gilligan, Kenneth A. Wallston. (2009) Costly myths: An analysis of idling beliefs and behavior in personal motor vehicles. *Energy Policy* 37: 2881-2888

81 Eco-Kings: About Us. Retrieved from <http://www.ecokings.ca/about.html> on April 16, 2010

Municipality of Jasper, Alberta

When the Municipality of Jasper adopted its *Anti-Idling By-Law #095*, on Sept. 4, 2007, it decided not to allow any acceptable idling.⁸² The lack of acceptable idling time has been questioned by certain municipalities wondering what happens in the case of inclement weather. In discussions with the Municipality of Jasper, it was stated that enforcement of temperature regulations are simply a matter of common sense. If extreme weather events occur, officers enforcing the by-law consider the health of vehicle occupants.

City of Burlington, Ontario

The City of Burlington adopted an anti-idling by-law in 2004 with an acceptable idling time of three minutes. In 2009, City staff recommended that the by-law be amended so that the acceptable idling time be reduced to one minute. This would align the policy with the by-law template supplied by Natural Resources Canada.⁸³

4.4 Land-use Restrictions

Explanation

In 2009, the Tim Hortons restaurant chain had total revenues of over \$2 billion.⁸⁴ Because half of the sales occur through the drive-through as is reported in an article in the Toronto Star and has been corroborated by an owner of a Tim Hortons in a small community⁸⁵, this translates into \$1 billion of drive-through sales. Broken down further, this equates to a net income for Tim Hortons of \$150 million from drive-through sales.⁸⁶ This is a substantial portion of sales for Tim Hortons. McDonalds, with 60 per cent of total revenue occurring at the drive-through window, is even more dependent on vehicle-oriented sales delivery.⁸⁷

Ron Christianson, a spokesperson for McDonalds, says drive-throughs, “are pretty important to some customer segments, like parents of young children and people who want to stay in the car when it’s dark or stormy”.⁸⁸ While the drive-through caters to certain elements of

82 Municipality of Jasper (2007) By-law #095, Anti-Idling By-law. Retrieved from http://74.125.93.132/search?q=cache%3AOUExWrYBk1IJ%3Ajasper-alberta.com%2Fuserfiles%2Fdocuments%2FFF14+All+by-laws%2F095_Idling_By-law.pdf+By-law+%2523095%2C+Anti-Idling+By-law&hl=en&gl=ca December 14, 2009

83 City of Burlington (2009) An Update of the City's Idling Initiatives including a Review of the Idling Control By-law and a Strategy to Increase Levels of Enforcement, P 3. Retrieved from <http://cms.burlington.ca/Page2893.aspx> on Nov. 3, 2009

84 Tim Hortons (2009) Five Year Performance Consolidated. Retrieved from <http://www.timhortons.com/ca/en/about/5-year.html> on April 11, 2010

85 Town of Comox (2009) Minutes of the Regular Council Meeting: Drive Throughs. Retrieved from <http://comox.ca/town-hall/meetings/minutes/2009-minutes/07-15%20RCM%20Minutes.pdf/> on April 11, 2010

86 Tim Hortons (2009) Tim Hortons Inc. Announces 2009 Fourth Quarter and Year-End Results. Retrieved from <http://www.newswire.ca/en/releases/archive/February2010/25/c4440.html> on April 11, 2010

87 Lu, Vanessa and Dana Flavelle (February, 15 2008) Drive-through ban eyed for city vehicles Retrieved from <http://www.thestar.com/news/gta/article/303944> on April 11, 2010

88 Lu, Vanessa and Dana Flavelle (February, 15 2008) Drive-through ban eyed for city vehicles Retrieved from <http://www.thestar.com/news/gta/article/303944> on April 11, 2010

society, such as people with disabilities and the frail elderly, drive-throughs promote an auto-centric culture that encourages idling and a sedentary lifestyle. Communities across Canada, in places such as North Vancouver, Calgary and Comox, British Columbia, have all banned new drive-throughs to some degree. These communities see the negative influences of drive-throughs far outweighing the positive.

Because communities have the power to regulate land-use they have the ability to restrict the development of new drive-throughs. In essence, because municipalities say what can be built and where, they can also say what type of development they do not want.

Benefits

The “benefits” and “challenges” of a restriction on the number and location of new drive-throughs often depend on which stakeholder group is asked. Community health advocates are likely to support restrictions to drive-throughs while drive-through owners are likely to see such restrictions as an infringement on their right to the free market. Thus said, some of the benefits to regulating drive-throughs include:

- Prioritizing pedestrians over vehicles. City of Calgary Alderman Brian Pincott voted in favour of restricting the number of drive-throughs in a Calgary subdivision stating that, “In a city trying to put pedestrians first and cars last, blocking new drive-throughs from being built makes sense”.⁸⁹ He continues, stating “We’ve got to start designing and building our city for people and drive-throughs are not about people, they’re about cars”.
- Achieving significant greenhouse gas emission reductions. The average drive-through transaction takes approximately three minutes to complete. If every person driving a light duty vehicle were to pick up just one order at Tim Hortons every day for a year it would result in 31,468 tonnes of GHG emissions.⁹⁰ If a prohibition on new drive-throughs were to be enacted that number could be reduced, contributing to a better quality of life in the community.
- Reducing fuel use for individual customers.

Challenges

The total elimination of drive-throughs would require individuals to think differently about the ease and conveniences they have become accustomed to. This is not necessarily a bad move, it is simply a different way of understanding our place in society. Some challenges that would need to be taken into account include:

- Adopting a lifestyle more cognizant of realistic time constraints. Drive-through services are the epitome of convenience; not having drive-throughs doesn’t make life inconvenient,

89 The Calgary Herald (June 26 2008) City urged to ban takeout windows. Retrieved from <http://www.canada.com/calgaryherald/news/story.html?id=47638478-6afc-4e00-b494-8587a35f4e73> on April 11, 2010

90 Natural Resources Canada (2008) The Idling Impact Calculator. Retrieved from <http://oee.nrcan-rncan.gc.ca/transportation/tools/calculators/Idling/idlingimpact-general.cfm> on April 11, 2010

but it does require additional planning.^{91 92}

- Countering the idea that the key to reducing greenhouse gas emissions is simply reducing the number of vehicles on the road. In reality, if automobiles must be used then at a least more efficient pattern of use can be encouraged. Rather than getting a coffee by way of the drive-through, having a driver actually get out of the car should provide quicker, more personable service.
- Challenging the notion that restricting drive-throughs necessarily results in an increase in the size of parking lots. This is a belief held by many, including John McInnes, owner of a McDonalds restaurant in Comox. In a presentation to Comox Town Council he stated, "... that what banning drive-throughs does do is create the need for larger parking lots, which leads to less green space."⁹³ Given the amount of space that is required for drive-through lanes, this argument is baseless.

Examples

Communities across Canada are already reviewing their land-use by-laws to see whether a drive-through restriction legislation can feasibly be implemented. One community example is:

Comox, British Columbia.

On July 15, 2009 the Town of Comox, a community with a population of just over 12,000, adopted a by-law limiting the establishment of new drive-through restaurants. A motion that would allow for existing drive-throughs but would prevent the establishment of new drive-throughs was passed.⁹⁴ A planner with the Town of Comox could not verify whether the by-law encouraged businesses to establish in one of the neighbouring communities rather than in Comox itself (Personal communication, April 12, 2010).

91 The Calgary Herald (June 26 2008) City urged to ban takeout windows. Retrieved from <http://www.canada.com/calgaryherald/news/story.html?id=47638478-6afc-4e00-b494-8587a35f4e73> on April 11, 2010

92 Canadian Restaurant and Foodservices Association (2009) Drive-Thrus. Retrieved from <http://www.cdfa.ca/news/bytopic/drivethroughs.asp> on April 11, 2010

93 Town of Comox (2009) Minutes of the Regular Council Meeting: Drive Thrus. Retrieved from <http://comox.ca/town-hall/meetings/minutes/2009-minutes/07-15%20RCM%20Minutes.pdf/> on April 11, 2010

94 Town of Comox (2009) Minutes of the Regular Council Meeting: Drive Thrus. Retrieved from <http://comox.ca/town-hall/meetings/minutes/2009-minutes/07-15%20RCM%20Minutes.pdf/> on April 11, 2010

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Municipality of Jasper (2007) By-law #095, Anti-Idling By-law. Retrieved from <http://74.125.93.132/search?q=cache%3AOUExWrYBk1IJ%3Ajasper-alberta.com%2Fuserfiles%2Fdocuments%2FF14+All+bylaws%2F095+Idling+Bylaw.pdf+Bylaw+%2523095%2C+Anti-Idling+Bylaw&hl=en&gl=ca> on December 14, 2009.

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on April 11, 2010.

Tim Hortons (2009) Tim Hortons Inc. Announces 2009 Fourth Quarter and Year-End Results. Retrieved from <http://www.newswire.ca/en/releases/archive/February2010/25/c4440.html> on April 11, 2010.

5.0 Managing Traffic Flow

5.1 Introduction

Reducing greenhouse gas emissions through traffic management is advantageous because it does not require private vehicle users to shift their habits or alter their modes of transport. This is especially helpful when sustainable transportation options such as transit, cycle paths or carpooling are not readily available. Rural areas in Nova Scotia face particular problems with distance and weather conditions. This section explores three alternative intersection improvements that have been used to combat idling and are appropriate for the Nova Scotian context.

The three options discussed are applicable for Nova Scotia, with its traffic volumes and rural urban composition. They are:

- Roundabouts
- Traffic signal synchronization
- Creating caution

5.2 Context

Before investing in any project, all alternatives must be explored. The U.S. National Transportation Operations Coalition writes, “In this time of competing investments and with the recognition that we cannot build our way out of congestion, it is more important than ever to make performance-based decisions on resource allocation”.⁹⁵ The Province of Nova Scotia, through the *Environmental Goals and Sustainable Prosperity Act* (2007), has made a reduction in greenhouse gas emissions a top consideration for operational efficiency. This report defines efficiency in terms of environmental efficiency while also recognizing economic and social efficiencies.

Though the benefits in terms of greenhouse gas reductions that traffic management provides are small in comparison to changes in land-use planning or shifting to active transportation, for trips that can only be made by vehicle, driving more efficiently is beneficial. Traffic management must be considered as one of the suite of things that must change in order for the province to meet its greenhouse gas reduction targets.

Certain advocates of sustainable transportation argue that improved traffic flow is tantamount to inviting more traffic onto the roads. That is, improving traffic flow actually produces additional traffic. Because the amount of time it takes to reach a destination may be lowered by traffic management and because per trip gasoline costs are lowered as a function of reduced time spent idling, the net result of the effort is a reduction in cost and also a decrease in the amount of time a driver spends in the vehicle. Because of these reasons, managing

⁹⁵ National Transportation Operations Coalition (2007) National Traffic Signal Report Card: Technical Report. p20 “Where Do We Go From Here?—Improving the Score” Retrieved from http://www.ite.org/REPORT-CARD/technical_report%20final.pdf on February 21, 2010

traffic can actually encourage vehicle use by a larger segment of the population. Todd Litman of the Victoria Transport Policy Institute writes:

Roadway improvements that alleviate congestion reduce the generalized cost of driving (i.e., the price), which encourages more vehicle use...In the short-run generated traffic represents a shift along the demand curve; reduced congestion makes driving cheaper per mile or kilometre in terms of travel time and vehicle operating costs.⁹⁶

Following Litman's logic, reducing idling will actually encourage more drivers to be on the road.

Joseph E. Hummer writes:

Many urban and suburban arterials are congested with little immediate hope of relief. Access management and better coordination between land use and transportation offer long-term hope for developing areas but little short-term promise for developed areas...public transportation will require shifts in land use before it provides major relief.⁹⁷

Hummer points to land-use planning as a key reason for traffic inefficiency.

Just because it is "easier" for traffic engineers to do what was done before, such as build a four-way stop and a traffic light where yield signs and a traffic circle would save both time and fuel, doesn't mean this is the "best" thing to do. Hummer continues, explaining that the negative consequences of exploring a new alternative are few but that the negative consequences of not acting to improve traffic flow are significant.⁹⁸

Michael J. Wallwork, a professional engineer who wrote the article entitled *A New Perspective on Road Design* highlights the fact that traffic engineers generally refer to standard documents rather than initiate change. Wallwork points to *Geometric Design of Streets and Highways*, the manual of the American Association of State Highway Officials and the *Manual of Uniform Traffic Control Devices*, as the "bibles" of roadway design, the two main standards that North American engineers use when designing roads.⁹⁹ Wallwork states that, "These documents are very much vehicle-orientated manuals with limited consideration given to the needs of other

96 Litman, Todd for Victoria Transport Policy Institute (2009) Generated Traffic and Induced Travel: Implications for Transport Planning. "Introduction" p2. Retrieved from <http://www.vtpi.org/gentraf.pdf> on March 4, 2010

97 Hummer, Joseph E. and Jonathon D. Reid (1998) Unconventional Left-Turn Alternatives for Urban and Suburban Arterials. Retrieved from http://findarticles.com/p/articles/mi_qa3734/is_199809/ai_n8824901/ on February 20, 2010.

98 Hummer, Joseph E. and Jonathon D. Reid (1998) Unconventional Left-Turn Alternatives for Urban and Suburban Arterials. Retrieved from http://findarticles.com/p/articles/mi_qa3734/is_199809/ai_n8824901/ on February 20, 2010.

99 Wallwork, Michael J. P.E (2000) A New Perspective on Road Design. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

roadway users”.¹⁰⁰ Because these manuals have definite parameters for roadway building they can be used as justifications for not thinking creatively about other, more efficient, solutions to traffic management.

5.3 Roundabouts

Explanation

Modern roundabouts are not rotaries, nor are they traffic circles. In an article entitled *A New Perspective on Road Design*, author Michael J. Wallwork states, “The modern roundabout is smaller, safer, slower, and has a much higher vehicle capacity than rotaries or traffic circles.”¹⁰¹ Though both modern roundabouts and rotaries/traffic circles are circular intersections with traffic flowing in a single direction with a circular median at the centre, the way in which the two are designed and driven are different. Until the summer of 2009, the Armdale rotary existed at the convergence of Chebucto Road, Quinpool Road, St. Margaret’s Bay Road, Herring Cove Road and Joseph Howe Drive in HRM. Many motorists avoided the rotary, as the one-and-one rule seemed to confound drivers. When converted to a modern roundabout, residents of the municipality had to relearn to drive the interchange, but the change meant a more efficient traffic system.

Table 1 Characteristics of circular intersections

Characteristic	Roundabout	Rotary/Traffic circle
Right of way	Vehicles inside the circle have right of way	Vehicle entering the circle have right of way
Deflection	Used as a tool to slow vehicles	Minimal deflection
Speed	No more than 30 kilometres per hour	50 kilometres per hour
Crashes	Minimal and at low speeds	Higher speed and angle of deflection mean more severe accidents ¹
Example	Typical intersection in the United Kingdom	Surrounding the Arc de Triumph in Paris, France

In an article detailing the evaluation and design for roundabouts, investigators state that roundabouts should “...be considered as an alternative intersection during all intersection improvements”.¹⁰²

100 Wallwork, Michael J. P.E (2000) *A New Perspective on Road Design*. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

101 Wallwork, Michael J. P.E (2000) *A New Perspective on Road Design*. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

102 Benekohal, Rahim F. and Varun Atluri for Illinois Centre for Transportation (2009) *Evaluation and Design: A Site Selection Procedure*. “Conclusions” p30. Civil Engineering Studies, Illinois Center for Transportation Series No. 09-051

Benefits

Documented evidence suggests the benefits of roundabouts are many. They include:

- Reducing idling. Wallwork reports, “They have much less delay and pollution than other forms of traffic control”.¹⁰³ Isaacs *et al.* write, “The requirement for vehicles to yield on roundabout approaches, rather than stop, leads to a reduction in idling time. This reduces vehicle emissions, creating less air pollution, and lowers fuel consumption.”¹⁰⁴

A report for Kansas State University states:

Vehicles stopping at traffic signals and stop signs emit more carbon dioxide (CO₂) when compared to roundabouts, as the delay and queuing are greater. Even if the delays are similar to that of roundabout, traffic signals always queue traffic at a red light and hence emissions are usually greater. The average delays at roundabouts have to be significantly larger than at traffic signals for the emissions to be equal. When traffic volumes are low, traffic rarely stops at a roundabout and the emissions are very small.¹⁰⁵

- Reducing noise pollution. Slower moving vehicles are quieter.¹⁰⁶
- Reducing serious vehicle incidents. An article published through the U.S. National Cooperative Highway Research Program found in an investigation of 11 roundabouts that accidents fell by 37 per cent over the number of incidents with the previous intersection type.¹⁰⁷ Other studies have put the number of crashes at 50 to 90 per cent lower.¹⁰⁸ Of the crashes that do occur, because vehicles speeds are lower,¹⁰⁹ injuries are usually less severe.¹¹⁰ This finding is collaborated by Bruce Corben who states, “It has also been reported in a number of studies that intersections controlled by traffic

103 Wallwork, Michael J. P.E (2000) A New Perspective on Road Design. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

104 Isaacs, Beatrice and Jill P. Barrett (2003) Use Of Roundabouts In An Urban Setting. p5 “Roundabouts vs Signalized Intersections: Environmental Considerations” Retrieved from http://www.urbanstreet.info/2nd_sym_proceedings/Volume%202/Isaacs.pdf on February 21, 2010

105 Mandavilli, Srinivas, Eugene R. Russell and Margaret J. Rys (2003) Impact of Modern Roundabouts on Vehicular Emissions p3. Retrieved from on February 20, 2010

106 Isaacs, Beatrice and Jill P. Barrett (2003) Use Of Roundabouts In An Urban Setting. p5 “Roundabouts vs Signalized Intersections: Environmental Considerations” Retrieved from http://www.urbanstreet.info/2nd_sym_proceedings/Volume%202/Isaacs.pdf on February 21, 2010

107 Jacquemart, Georges for National Cooperative Highway Research Program (1998) Synthesis of Highway Practice 264: Modern Roundabout Practice in the United States p 42 Retrieved from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_264.pdf on March 1, 2010.

108 Wallwork, Michael J. P.E (2000) A New Perspective on Road Design. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

109 Wallwork, Michael J. P.E (2000) A New Perspective on Road Design. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

110 Insurance Institute for Highway Safety (July 28, 2001) Status Report: Roundabouts p2. Retrieved from <http://www.iihs.org/externaldata/srdata/docs/sr3607.pdf> on February 22, 2010

signals generally exhibit lower safety performance than comparable intersections controlled by roundabouts”¹¹¹. In essence, roundabouts are safer than traffic signals.

- Increasing safety for pedestrians. Rather than crossing lanes of traffic for vehicles in both directions (at least four lanes, two in each direction). Pedestrians encountering roundabouts walk around the intersection and when crossing lanes of traffic they only deal with traffic flowing in one direction. The U.S. Insurance Institute for Highway Safety reports that, “Studies in Europe indicate that, on average, converting conventional intersections to roundabouts can reduce pedestrian crashes by about 75 per cent.”¹¹²
- Maintaining intersections. Light-controlled intersections cost approximately \$5,000 (US) for electricity and bulb replacement.¹¹³ Aside from initial landscaping, roundabouts are largely maintenance free.¹¹⁴
- Increasing vehicle capacity. Roundabouts have a higher capacity than other traffic control measures such as stop signs.¹¹⁵
- Reducing traffic. Because a roundabout uses a slower but continuous flow of traffic, “...delays were reduced by as much as 75 per cent after construction of a roundabout ...The roundabout handles traffic more efficiently, and can thus accommodate a higher volume of traffic,”¹¹⁶ writes Isaacs *et al.*

An article by Isaacs and Barrett, summarizes the benefits of modern roundabouts as follows:

All over the world, roundabouts that have been properly designed and constructed at appropriate locations have demonstrated that they are superior to signalized intersections in safety, capacity, environmental considerations, economics and esthetics. The geometry of roundabouts eliminates most of the angles and traffic flows that create the potential for crashes at signalized intersections, while the continuous movement of vehicles, albeit at slower speeds, increases the capacity of an intersection.¹¹⁷

All studies report that once initial distrust of roundabouts is overcome, the benefits of the circular traffic system are multifold.

111 Corben, Bruce (1989) Crashes at Traffic Signals. Retrieved from <http://www.monash.edu.au/muarc/reports/muarc007.pdf> on February 20, 2010

112 Insurance Institute for Highway Safety (2010) Q&As: Roundabouts. Retrieved from <http://www.iihs.org/research/qanda/roundabouts.html#cite16> on April 18, 2010

113 Isaacs, Beatrice and Jill P. Barrett (2003) Use Of Roundabouts In An Urban Setting. Retrieved from http://www.urbanstreet.info/2nd_sym_proceedings/Volume%202/Isaacs.pdf on February 21, 2010

114 Wallwork, Michael J. P.E (2000) A New Perspective on Road Design. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

115 Wallwork, Michael J. P.E (2000) A New Perspective on Road Design. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

116 Isaacs, Beatrice and Jill P. Barrett (2003) Use Of Roundabouts In An Urban Setting. p5 “Roundabouts vs Signalized Intersections: Capacity” Retrieved from http://www.urbanstreet.info/2nd_sym_proceedings/Volume%202/Isaacs.pdf on February 21, 2010

117 Isaacs, Beatrice and Jill P. Barrett (2003) Use Of Roundabouts In An Urban Setting. p4 “Roundabouts vs Signalized Intersections” Retrieved from http://www.urbanstreet.info/2nd_sym_proceedings/Volume%202/Isaacs.pdf on February 21, 2010

Challenges

Though replacing signalized intersections with modern roundabouts has numerous benefits, changing an intersection's configuration also has challenges. Some of these challenges may even make conversion impossible:

- Optimizing diameter of circle. Multilane roundabouts often compare more favourably on a space per lane basis than do single lane roundabouts.¹¹⁸ Other studies consider smaller circle diameters to be beneficial because they slow average traffic speed.¹¹⁹
- Disrupting platoon within a signal network. Traffic signal synchronization depends on standard speeds and specific traffic lengths between intersections. Roundabout timing is often more erratic than standard traffic signals.¹²⁰
- Experiencing unequal traffic volumes from different directions. The National Cooperative Highway Research Program states problems occur with, "Locations with heavy flows on the major road and low flows on the minor road, where the equal opportunity treatment of the approaches causes undue delays to the major road."¹²¹
- Locating roundabout on a flat plateau. The U.S. National Cooperative Highway Research Program states that roundabout construction requires a surface with a grade of no more than three to five per cent.¹²²
- Accommodating "special" users. Proximity to fire stations or rail crossings as well as the number of cyclists, pedestrians and persons with disabilities using the intersection must all be taken into account.¹²³
- Public perception. Mandavilli *et al.*, recount that:
Without a successful education program or first-hand experience and observation, the public can incorrectly associate all "roundabouts" with the older, inefficient, confusing traffic circles or rotaries they have experienced or heard negative remarks about or with neighbourhood traffic circles, generally disliked in many areas.¹²⁴

118 Jacquemart, Georges for National Cooperative Highway Research Program (1998) Synthesis of Highway Practice 264: Modern Roundabout Practice in the United States p 42 Retrieved from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_264.pdf on March 1, 2010.

119 Jacquemart, Georges for National Cooperative Highway Research Program (1998) Synthesis of Highway Practice 264: Modern Roundabout Practice in the United States p 47 Retrieved from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_264.pdf on March 1, 2010.

120 Jacquemart, Georges for National Cooperative Highway Research Program (1998) Synthesis of Highway Practice 264: Modern Roundabout Practice in the United States p 42 Retrieved from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_264.pdf on March 1, 2010.

121 Jacquemart, Georges for National Cooperative Highway Research Program (1998) Synthesis of Highway Practice 264: Modern Roundabout Practice in the United States p 42 Retrieved from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_264.pdf on March 1, 2010.

122 Jacquemart, Georges for National Cooperative Highway Research Program (1998) Synthesis of Highway Practice 264: Modern Roundabout Practice in the United States p 42 Retrieved from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_264.pdf on March 1, 2010.

123 Jacquemart, Georges for National Cooperative Highway Research Program (1998) Synthesis of Highway Practice 264: Modern Roundabout Practice in the United States p 42 Retrieved from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_264.pdf on March 1, 2010.

124 Mandavilli, Srinivas, Eugene R. Russell and Margaret J. Rys (2003) Operational Efficiency of Rounda-

Examples

Roundabouts can be used in any situation if the parameters are correct. This means roundabouts may be found on city streets, arterials, small towns and even rural areas. One example is:

Vail and Avon, Colorado¹²⁵

In Colorado, every intersection along a stretch of highway between Vail and Avon has been converted to a roundabout. The mountain pass is now aptly named “Roundabout Valley”. A 2010 report by Oursten Roundabout Engineering states the following project lessons:

- The modern way to eliminate traffic congestion is to build roundabouts at the most heavily impacted intersections.
- Roundabouts eliminate congestion, leaving beauty in its place.
- Roundabouts are safer and more efficient than traffic signals.
- Roundabouts are safer and more efficient than cross intersections.
- It usually costs much less to widen nodes than to widen links, especially where links are expensive, as at interchanges, at the ends of tunnels and bridges, and through built-up areas.

The total cost for the project was \$2.8 million (US) which resulted in annual cost savings of \$85,000 (US) for traffic direction officers. Queues no longer exceed 10 vehicles and serious accidents have been reduced from five to three in the year following implementation. The crash rate for the first year of operation dropped to 22 crashes in the after period from a yearly average of 25 crashes in the before period. The project received a high approval rating, 4.4 on a scale of 5.¹²⁶

5.4 Traffic Signal Synchronization

Explanation

When driving somewhere it often seems like your luck for lights is either really good or really bad; either you hit every red or you fly through on all green lights. The reason for this is not magic but a specific sequence of traffic signal synchronization. The lights are timed in such

p7. Retrieved from http://www.urbanstreet.info/2nd_sym_proceedings/Volume%202/Russell.pdf on February 21, 2010

125 Oursten Roundabout Engineering (2010) Roundabout Interchanges. Retrieved from <http://www.ourston.com/index.php?id=71> on March 1, 2010.

126 Oursten Roundabout Engineering (2010) Roundabout Interchanges. Retrieved from <http://www.ourston.com/index.php?id=71> on March 1, 2010.

a way that allows a vehicle to move from signal to signal without needing to stop. Traffic signal synchronization can include, "...the development and implementation of new signal timing parameters, phasing sequences, improved control strategies and, occasionally, minor roadway improvements".¹²⁷

In an article entitled, *The Benefits of Retiming Traffic Signals* author Sunkari writes, "Signal timing strategies include the minimization of stops, delays, fuel consumption and air pollution emissions and the maximization of progressive movement through a system".¹²⁸ In essence, by coordinating traffic signal timing a traffic authority aims to reduce travel times and air pollution.

Benefits

Documented evidence suggests the benefits of traffic signal synchronization are many. They include:

- Eliminating extra costs due to additional infrastructure.¹²⁹ Sunkari states that, "It can produce benefit to cost ratios as high as 40:1."¹³⁰ Expressing the amount of funding required to perform the maintenance required for optimal signal performance, the U.S. National Transportation Operations Coalition argues that:
To support this level of routine signal timing updates nationally, transportation agencies would need to spend an amount equivalent to less than 0.2 per cent of the total national expenditure on highway transportation. When the figure is put into context, the cost of improving signal timing is miniscule, compared to annual highway expenditures.¹³¹
- Moving significant amounts of traffic along major roads.¹³²
- Reducing travel time on arterials. A case study in Austin, Texas reports a time savings of 9.8 per cent.¹³³ Though not yet completed, a traffic signal synchronization program in

127 Sunkari, Srinvasa (2004) *The Benefits of Retiming Traffic Signals* "What is Signal Retiming?" p 26 ITE Journal, Retrieved from <http://www.spcregion.org/downloads/ops/Other%20Studies/BenefitsofRetimingTrafficSignals.pdf> on February 28, 2010

128 Sunkari, Srinvasa (2004) *The Benefits of Retiming Traffic Signals* p 26 "What is Signal Retiming?" ITE Journal, Retrieved from <http://www.spcregion.org/downloads/ops/Other%20Studies/BenefitsofRetimingTrafficSignals.pdf> on February 28, 2010

129 Sunkari, Srinvasa (2004) *The Benefits of Retiming Traffic Signals* "What is Signal Retiming?" p 26 ITE Journal, Retrieved from <http://www.spcregion.org/downloads/ops/Other%20Studies/BenefitsofRetimingTrafficSignals.pdf> on February 28, 2010

130 Sunkari, Srinvasa (2004) *The Benefits of Retiming Traffic Signals*, p27 "Why is signal retiming conducted?" ITE Journal, Retrieved from <http://www.spcregion.org/downloads/ops/Other%20Studies/BenefitsofRetimingTrafficSignals.pdf> on February 28, 2010

131 National Transportation Operations Coalition (2007) *National Traffic Signal Report Card: Technical Report*. p21 "Where Do We Go From Here?—Improving the score, Routine Signal Timing Evaluations" Retrieved from http://www.ite.org/REPORTCARD/technical_report%20final.pdf on February 21, 2010

132 Wallwork, Michael J. P.E (2000) *A New Perspective on Road Design*. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

133 National Transportation Operations Coalition (2007) *National Traffic Signal Report Card: Technical*

- Denver, Colorado expects savings of five to 15 per cent.¹³⁴
- Reducing number of stops. The Austin, Texas case study reported 28 per cent fewer stops.¹³⁵
 - Reducing fuel consumption. The Austin, Texas case study reported a reduction of 3.5 per cent.¹³⁶
 - Reducing “emergency” calls with a regular maintenance schedule. The Austin, Texas case study reports that performing regular checks cut the number of traffic light incidents in half.¹³⁷

Challenges

Though improving the timing of signalized intersections has numerous benefits, changing an intersection’s configuration also has challenges. These challenges may include:

- Requiring regular maintenance. Sunkari writes,
Signal timing is effective only as long as the traffic patterns that were used to generate the signal timing are reasonably constant...Traffic engineers should review traffic signal and system performance continuously. Ideally, signal timing should be reviewed every year to evaluate effectiveness and efficiency...At a minimum, an operating agency should budget to retime traffic signals at least every three years, especially in developing areas and/or areas with sustained growth.¹³⁸
- Delaying drivers on side streets. In order to move large volumes of traffic efficiently along major corridors, the minor corridors suffer from delays.¹³⁹

Report. p14 “Case Studies” Retrieved from http://www.ite.org/REPORTCARD/technical_report%20final.pdf on February 21, 2010

134 United States Department of Transportation - Federal Highway Administration (2009) SAFETEA-LU 1808: CMAQ, “Denver’s Traffic Signal System Improvement Program (TSSIP): Estimation of Air Quality Benefits” Retrieved from <http://www.fhwa.dot.gov/environment/cmaqpgs/fhwahep09026/index.htm> on February 28, 2010.

135 National Transportation Operations Coalition (2007) National Traffic Signal Report Card: Technical Report. p14 “Case Studies” Retrieved from http://www.ite.org/REPORTCARD/technical_report%20final.pdf on February 21, 2010

136 National Transportation Operations Coalition (2007) National Traffic Signal Report Card: Technical Report. p14 “Case Studies” Retrieved from http://www.ite.org/REPORTCARD/technical_report%20final.pdf on February 21, 2010

137 National Transportation Operations Coalition (2007) National Traffic Signal Report Card: Technical Report. p13 “Case Studies” Retrieved from http://www.ite.org/REPORTCARD/technical_report%20final.pdf on February 21, 2010

138 Sunkari, Srinvasa (2004) The Benefits of Retiming Traffic Signals, p28 “How Often Should Signal Retiming be Conducted?” ITE Journal, Retrieved from <http://www.spcregion.org/downloads/ops/Other%20Studies/BenefitsofRetimingTrafficSignals.pdf> on February 28, 2010

139 Wallwork, Michael J. P.E (2000) A New Perspective on Road Design. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

- Financing the signal retiming process.¹⁴⁰¹⁴¹ The typical cost of retiming a signal intersection is \$2,500 (US) according to Sunkari.
- Justifying spending on traffic lights is difficult because of other more pressing matters.¹⁴² The National Transportation Operations Coalition agrees with other research on the issue, stating:
More sustained, stable and consistent resources must be committed to the management processes and professionals who design, operate and maintain traffic signal assets to provide significant reductions in congestion, delay, fuel consumption and emissions.¹⁴³

Examples

Traffic signal synchronization can lead to time and energy savings in specific situations. In order to assess the type of savings your community can achieve a study may need to be completed. Some communities that have done this are:

Austin, Texas

The City of Austin, Texas has adopted a program of proactively checking all signals in an effort to cutback on the number of emergency response calls. The City has been able to reallocate funding from a response-oriented approach to a preemptive approach. Austin, a city twice the size of HRM, reduced its complaint and failure responses from 5,000 to 2,500 with no additional cost.¹⁴⁴ The experience of Austin is consistent with the experiences of other traffic departments. The National Transportation Operations Coalition identifies the benefits of investing in traffic signal systems to be as great as 40:1.¹⁴⁵

140 Sunkari, Srinvasa (2004) The Benefits of Retiming Traffic Signals, p28 “What is the Cost of Retiming Traffic Signals?” ITE Journal, Retrieved from <http://www.spcregion.org/downloads/ops/Other%20Studies/BenefitsofRetimingTrafficSignals.pdf> on February 28, 2010

141 National Transportation Operations Coalition (2007) National Traffic Signal Report Card: Technical Report. p20 “Where Do We Go From Here?—Improving the Score” Retrieved from http://www.ite.org/REPORTCARD/technical_report%20final.pdf on February 21, 2010

142 Sunkari, Srinvasa (2004) The Benefits of Retiming Traffic Signals, p28 “What is the Cost of Retiming Traffic Signals?” ITE Journal, Retrieved from <http://www.spcregion.org/downloads/ops/Other%20Studies/BenefitsofRetimingTrafficSignals.pdf> on February 28, 2010

143 National Transportation Operations Coalition (2007) National Traffic Signal Report Card: Technical Report. p20 “Where Do We Go From Here?—Improving the Score” Retrieved from http://www.ite.org/REPORTCARD/technical_report%20final.pdf on February 21, 2010

144 National Transportation Operations Coalition (2007) National Traffic Signal Report Card: Technical Report. p13 “Case Studies” Retrieved from http://www.ite.org/REPORTCARD/technical_report%20final.pdf on February 21, 2010

145 National Transportation Operations Coalition (2007) National Traffic Signal Report Card: Technical Report. p20 “Where Do We Go From Here?—Improving the Score” Retrieved from http://www.ite.org/REPORTCARD/technical_report%20final.pdf on February 21, 2010

Nashville, Tennessee

Following a traffic signal timing optimization study, Davidson County in Metro Nashville, Tennessee implemented a traffic improvement project. Though the top priority of the project was to improve traffic flow, the County also aimed it - and succeeded - at reducing greenhouse gas emissions. As a result of the project, fuel consumption per vehicle decreased by 11.4 per cent.¹⁴⁶ The benefits of the project include:

- Reducing traffic congestion. Residents did achieve a significant savings in fuel costs
- Reducing harm to the environment. Fuel savings and resultant greenhouse gas savings
- Improving fiscal health. The rate of return on initial investment was 27:1.¹⁴⁷

The total project cost for the signal timing optimization was \$750,000 (US) and reaped a benefit to cost ratio of 81:1.^{148,149}

146 Kimley Horn and Associates Ltd for The Metropolitan Government of Nashville and Davidson County's Department of Public Works (2008) Traffic Signal Timing Optimization Study for the Metro Nashville Signal System Supplement III. p4 "Results" Retrieved from <http://74.125.93.132/search?q=cache:vWHxo4gnNqIJ:www.nashville.gov/pw/pdfs/SummaryReportIII.pdf+Traffic+Signal+Timing+Optimization+Study+for+the+Metro+Nashville+Signal+System+Supplement&cd=1&hl=en&ct=clnk&gl=ca&client=safari> on February 28, 2010

147 Kimley Horn and Associates Ltd for The Metropolitan Government of Nashville and Davidson County's Department of Public Works (2008) Traffic Signal Timing Optimization Study for the Metro Nashville Signal System Supplement III. p8 "Conclusions" Retrieved from <http://74.125.93.132/search?q=cache:vWHxo4gnNqIJ:www.nashville.gov/pw/pdfs/SummaryReportIII.pdf+Traffic+Signal+Timing+Optimization+Study+for+the+Metro+Nashville+Signal+System+Supplement&cd=1&hl=en&ct=clnk&gl=ca&client=safari> on February 28, 2010

148 Kimley Horn and Associates Ltd for The Metropolitan Government of Nashville and Davidson County's Department of Public Works (2008) Traffic Signal Timing Optimization Study for the Metro Nashville Signal System Supplement III. P1 "Conclusions" Retrieved from <http://74.125.93.132/search?q=cache:vWHxo4gnNqIJ:www.nashville.gov/pw/pdfs/SummaryReportIII.pdf+Traffic+Signal+Timing+Optimization+Study+for+the+Metro+Nashville+Signal+System+Supplement&cd=1&hl=en&ct=clnk&gl=ca&client=safari> on February 28, 2010

149 Kimley Horn and Associates Ltd for The Metropolitan Government of Nashville and Davidson County's Department of Public Works (2008) Traffic Signal Timing Optimization Study for the Metro Nashville Signal System Supplement III. pi "Conclusions" Retrieved from <http://74.125.93.132/search?q=cache:vWHxo4gnNqIJ:www.nashville.gov/pw/pdfs/SummaryReportIII.pdf+Traffic+Signal+Timing+Optimization+Study+for+the+Metro+Nashville+Signal+System+Supplement&cd=1&hl=en&ct=clnk&gl=ca&client=safari> on February 28, 2010

5.5 Creating Caution: Naked Streets, Removal of Lights, Use of Yield Signs

We only want traffic lights where they are useful and I haven't found anywhere where they are useful yet... In short, if motorists are made more wary about how they drive, they behave more carefully.¹⁵⁰

- Hans Monderman
Traffic planner, Shared Space
Drachten, The Netherlands

Explanation

Tom Vanderbilt argues in his book *Traffic* that active vigilance at an intersection through the removal of traffic signal devices can actually work to improve safety. Rather than driving becoming a rote activity, removing signs and signals makes the driver an active participant in road safety.¹⁵¹ North Americans seem to oppose Vanderbilt's observations, arguing that light-controlled intersections have a higher guarantee of safety. The Transport Research Laboratory sides with Vanderbilt. As quoted in *The Telegraph*, it states that, "It is a myth that signals guarantee safety".¹⁵² Though it may be a myth, the North American public still views signalized intersections as safer than those controlled only by signs. The argument for a reduced number of signals is largely falling on deaf ears.

A number of techniques can be used to increase a driver's awareness of his or her situation while at the same time reducing idling and increasing safety. The following strategies can be used:

- Naked Streets - "The concept works on the principle that motorists are more likely to drive carefully if they use their own judgment, rather than unthinkingly obeying instructions. The question of who has priority is deliberately left open, making drivers more cautious."¹⁵³
- The removal of traffic lights. Reducing the number of "stops" a vehicle makes reduces the number of times a vehicle needs to accelerate. Braking and accelerating are very fuel-intensive driving scenarios. By eliminating these phases from the driving cycle the emissions produced by a vehicle can be drastically reduced.
- Filter in turning - The States of Guernsey, UK says, "At these junctions all directions have equal priority. You must only enter the junction in turn with other vehicles. These are also usually box junctions, so you must not enter the box unless your exit is clear."¹⁵⁴

150 Millward, David (12:01AM GMT 04 November 2006) Is this the end of the road for traffic lights? *Telegraph*. Retrieved from <http://www.telegraph.co.uk/news/uknews/1533248/Is-this-the-end-of-the-road-for-traffic-lights.html> on March 7, 2010

151 Gourlay, Chris (September 6, 2009) Councils to cut crashes with 'naked streets'. *Times Online*. Retrieved from <http://www.timesonline.co.uk/tol/news/politics/article6823324.ece> on March 7, 2010

152 Cassini, Martin (12:01AM BST 14 Oct 2006) Rip Them Out. *The Telegraph* Retrieved from <http://www.telegraph.co.uk/motoring/road-safety/2743688/Rip-them-out.html> on March 7, 2010

153 Gourlay, Chris (September 6, 2009) Councils to cut crashes with 'naked streets'. *Times Online* Retrieved from <http://www.timesonline.co.uk/tol/news/politics/article6823324.ece> on March 7, 2010

154 States of Guernsey. Visitors and New Residents: Driving in Guernsey is different. Retrieved from <http://>

- The use of yield signs rather than stop signs or lights. Using yield signs rather than signal lights eliminates the start-stop phase of driving. In his article *A New Perspective on Road Design*, Wallwork states that the yield sign is, “An under-utilized device which, when the sight distance requirements are met, is more efficient than a stop sign... In other countries the yield sign is the control of choice as it does not require the driver to stop.”¹⁵⁵

Benefits

Documented evidence suggests the benefits of creating caution through the use of alternative intersection controls include:

- Reducing the need for enforcement. Yield signs or the elimination of signs altogether rely on individual judgment for choosing safe crossing. Police are not required to issue tickets for merely coming to a rolling stop rather than a complete stop at yield signs or uncontrolled intersections.
- Encouraging more conscientious driving. Vehicle operators are required to actively engage with other road users to establish dominance and safe passage.
- Reducing greenhouse gas emissions. The same argument that is made in favour of roundabouts, that is that the action of stopping and waiting is more fuel intensive than simply slowing down, can be used to justify an increased use of yield signs, the elimination of stop signs, filter in turning and Naked Streets. In a report entitled *Environmental Impact of Modern Roundabouts* by Mandavilli *et al.*, state that:

Road and street intersections force vehicular traffic to slow down and stop in varying patterns of interruption of ideal, constant traffic flow at an ideal speed. Modern roundabouts in the USA, which are functioning as one of the safest and most efficient forms of intersection control (Russell *et al.*, 2000, 2002a, b) and improving traffic flow at intersections, have the additional advantage of cutting down vehicular emissions and fuel consumption by reducing vehicle idling time at the intersections thereby having a positive affect on the environment.¹⁵⁶
- Increasing safety for road users. For example, “Removing some road markings and railings in Kensington High Street, west London, led to accidents falling by 44 per cent over two years.”¹⁵⁷

www.gov.gg/ccm/navigation/travel-transport/visitors---new-residents/;jsessionid=44FD9F6732FDE9E73D77A04576ECCA11 on March 7, 2010

155 Wallwork, Michael J. P.E (2000) *A New Perspective on Road Design*. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

156 Mandavilli, Srinivas. Margaret J. Rys, Eugene R. Russell (2007) *Environmental impact of modern roundabouts*. Retrieved from http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V31-4N2M67S-1&_user=10&_coverDate=02%2F29%2F2008&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1214884728&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=0d16c153ab6e61f5b1ab75ea0adeaf10 on February 20, 2010.

157 Gourlay, Chris (September 6, 2009) *Councils to cut crashes with ‘naked streets’*. Times Online Retrieved from <http://www.timesonline.co.uk/tol/news/politics/article6823324.ece> on March 7, 2010

- Reducing costs. Dedicating resources for the maintenance and operation of traffic signals are no longer required
- Improving spatial quality with non-signalized intersections^{158 159}

Challenges

Using signs over signals, or eliminating signs and signals altogether has numerous challenges, these include:

- Combating driver inattention. Drivers usually pay attention to traffic signals but stop signs are often ignored. Numbers as high as 68 per cent are reported for ignoring stop signs.¹⁶⁰ The public is concerned that the number of inattentive drivers will be even higher.
- Negotiating driver unfamiliarity. Drivers from areas outside of where the alternative intersections are may be confused by the “new” situation, though in most situations this means drivers have an increased level of attentiveness rather than making mistakes that would jeopardize other road users.
- Facing potential liability in accident situations. Any sign can be blamed for accidents. Blaming a sign for an incident is more persuasive than blaming a traffic signal.¹⁶¹ This may make municipalities less willing to erect yield signs or remove traffic signals as they could fear being sued for improper maintenance or a lack of proper signage.
- Combating the perception that these intersections are not as safe as those controlled by traffic lights. A report that details the safety concerns at unpaved intersections states that the elderly, automobile drivers and cyclists all perceive unsignalized intersections to inherently be more risky than lights.¹⁶²

158 Noordelijke Hogeschool Leeuwarden (2007) The Laweiplein Evaluation of the reconstruction into a square with roundabout. “Summary” p6. Retrieved from <http://www.fietsberaad.nl/library/repository/bestanden/Evaluation%20Laweiplein.pdf> on March 13, 2010

159 Noordelijke Hogeschool Leeuwarden (2007) The Laweiplein Evaluation of the reconstruction into a square with roundabout. “Summary” p6. Retrieved from <http://www.fietsberaad.nl/library/repository/bestanden/Evaluation%20Laweiplein.pdf> on March 13, 2010

160 Wallwork, Michael J. P.E (2000) A New Perspective on Road Design. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

161 Wallwork, Michael J. P.E (2000) A New Perspective on Road Design. Retrieved from <http://www.roundabouts.net/roaddesign.html> on February 13, 2010

162 Noordelijke Hogeschool Leeuwarden (2007) The Laweiplein Evaluation of the reconstruction into a square with roundabout. “Summary” p6. Retrieved from <http://www.fietsberaad.nl/library/repository/bestanden/Evaluation%20Laweiplein.pdf> on March 13, 2010

Examples

Ultra-Low Volume Unpaved Intersections

In rural Nova Scotia many of the intersections that municipalities control will fall under the description of ultra-low traffic. With any intersection, it is important to match the conditions that the intersection will be used under with the ideal model for those specifications. In his report on ultra-low volume intersections, Reginald R. Souleyrette¹⁶³ outlines the process by which any intersection conversion or installation should be approached. Ideally, this includes:

- Recommended procedures for removal or conversion of two-way Stop control from low volume rural locations include:
- Establishment of a formal policy,
- Consultation with agency legal counsel and traffic control experts,
- Review of [Manual on Uniform Traffic Control Devices] applications for Stop and Yield signs
- Appropriate public notice,
- Documentation and follow-up review.

Exact information regarding intersection conversions is not available - every intersection has a unique set of circumstances.

Table 2.2 Summary of intersection advantages

Intersection improvement	Ability to reduce idling	Ideal uses	Challenges	Examples
Roundabouts	High - Uses yields instead of stops	Modern roundabouts are especially great for non-conventional interchanges	Need to overcome initial public opposition. Are often associated with “old school” rotaries	England builds 1000 per year. Numerous examples in Kansas and other US mid-west states
Traffic signal synchronization	Moderate - Reduces stop time and can shave minutes off commute	Can be used with any existing interchange that has lights	Ideally need to be maintained at least every three years. May induce traffic because of better flow	Popular in North America
Creating caution	High - reduces unnecessary stops and starts	Intersections that are currently four way or two way stops	General perception that stop signs or lights are “safer” than uncontrolled intersections	Drachten, Netherlands. Tested with schemes in London, Brighton and Ashford in Kent. ²

¹⁶³ Souleyrette, Reginald R. et al. (2005) Safety Effectiveness of Stop Control At Ultra-Low Volume Unpaved Intersections. Retrieved from <http://pubsindex.trb.org/view.aspx?id=776741> on March 14, 2010.

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Mandavilli, Srinivas, Eugene R. Russell and Margaret J. Rys (2003) Impact of Modern Roundabouts on Vehicular Emissions Retrieved from on February 20, 2010

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6.0 Vehicle Efficiency

6.1 Introduction

In an article titled *Costly Myths: An Analysis of Idling Beliefs and Behavior in Personal Motor Vehicles*, authors Carrico *et. al.*, state that vehicle idling is responsible, "...for a non-trivial amount of CO₂ emissions and fuel use annually."¹⁶⁴ The article continues, stating that over 51 per cent of all idling occurs while in traffic.¹⁶⁵

Idling while in traffic at first may seem to be outside of a driver's control. However, solutions to this problem do exist by means of vehicle standards, regulations and new technology. These options will be discussed below. Public education is also needed, but this has been discussed in Section 2.

6.2 Context

Nova Scotians have become accustomed to driving. Many people realize that although a vehicle is less energy efficient than is public transit, the comfort, convenience and security of the private automobile seems to trump concern for the environment. Though people should be encouraged to use public transit, this only works if public transportation systems are an option. In many parts of Nova Scotia, public transportation is a dream, not a reality - though it seems that more communities are recognizing that public transportation systems are necessary for the well-being of a community.

Gardner and Stern recognize that abandoning technology that has become an integral part of how individuals operate is unlikely. This includes jettisoning the private vehicle – it is unlikely that people will willingly give up something that has become such a big part of their lives. In their paper titled, *The Short List: The Most Effective Actions U.S. Households Can Take to Curb Climate Change*, Gardner and Stern state, "...efficiency-improving actions generally save more energy—and reduce carbon emissions more — than curtailing use of intrinsically inefficient equipment".¹⁶⁶ Rather than expect people to give up their private vehicles entirely, a move that has a greater chance of success is to limit private vehicle trips and to improve the energy efficiency of the trips that cannot or will not be eliminated. One example given is how "...buying and maintaining a highly fuel-efficient vehicle saves more energy than carpooling to work with

164 Amanda R. Carrico, Paul Padgett, Michael P. Vandenberg, Jonathan Gilligan, Kenneth A. Wallston. 2009. Costly myths: An analysis of idling beliefs and behavior in personal motor vehicles. *Energy Policy* 37: 2881-2888.

165 Amanda R. Carrico, Paul Padgett, Michael P. Vandenberg, Jonathan Gilligan, Kenneth A. Wallston. 2009. Costly myths: An analysis of idling beliefs and behavior in personal motor vehicles. *Energy Policy* 37: 2884

166 Gardner, G.T and Paul C, Stern for Environment (December 15, 2009) *The Short List: The Most Effective Actions U.S. Households*. P17 Retrieved from <http://www.environmentmagazine.org/Archives/Back%20Issues/September-October%202008/gardner-stern-full.html> on April 12, 2010

another person.”¹⁶⁷ The work of Carrico *et. al.*, concurs with this, stating that, “Historically, policymakers have tended to focus on behaviours that have the highest degree of elasticity, such as the use of public transportation, with little regard to the level of behaviour change that can be realistically expected”.¹⁶⁸ Policy makers simply encourage people to take the bus without regard for the number of people who will actually follow that advice.

6.3 Vehicle Regulations

Explanation

Ideally, auto manufacturers would design cars and trucks to operate on the least amount of fuel as possible - unfortunately, this hasn't been the case.

Vehicles such as Hummers and Jeep Wranglers consume more fuel than most other vehicles but because they are marketed as luxury items for a certain market segment they have been popular. As fuel prices increase and as regulations of fuel emissions tighten, these vehicles will likely fall out of favour. The question that society must answer is: if we know these vehicles are bad for the planet, why do we insist on using them? Why should we wait until market forces play centre stage?

Government could act to have these vehicles pulled from the market immediately. Increasing fuel efficiency involves engine design, stop-start systems and, possibly, hybrid technology. Car manufacturers are encouraged to use the smallest, most fuel-efficient motor as possible for the task that must be completed but they are often not required by law to push the envelope to a great enough extent. Manufacturers will argue that they are pushing the boundary for fuel efficiency but whether they should be pushing harder is a question for debate.

The emissions level resulting from needless vehicular idling is directly related to fuel efficiency. An idling vehicle may consume fuel at a lower rate than would a comparable vehicle accelerating or decelerating but any idling vehicle is consuming fuel needlessly. Since this is the case and because technology exists that can automatically turn off a vehicle's motor when that vehicle is stopped, why does government not demand this of manufacturers?

When the Constitution was drafted in 1867, air pollution and vehicle standards were not an issue. Almost 150 years later, both the federal government and the provincial governments have legislative authority over vehicle standards. Currently, only British Columbia and Quebec have adopted standards stricter than those of the federal government.

¹⁶⁷ Gardner, G.T and Paul C, Stern for Environment (December 15, 2009) The Short List: The Most Effective Actions U.S. Households.p17 Retrieved from <http://www.environmentmagazine.org/Archives/Back%20Issues/September-October%202008/gardner-stern-full.html> on April 12, 2010

¹⁶⁸ Amanda R. Carrico, Paul Padgett, Michael P. Vandenberg, Jonathan Gilligan, Kenneth A. Wallston. 2009. Costly myths: An analysis of idling beliefs and behavior in personal motor vehicles. *Energy Policy* 37: 2881-2888.

Benefits

Documented evidence suggests the benefits of stricter vehicle standards are many. They include:

- Saving individual drivers money. The government of British Columbia implemented a stricter regulations resulting in cost savings for individual drivers:
 - On average, consumers will save \$3,600 in fuel costs over the life of a new vehicle (based on fuel at \$1/litre). These savings will pay back any increases in vehicle costs in about three years.¹⁶⁹
- Increasing choice of fuel-efficient vehicles for consumers. Rather than only having one vehicle per manufacturer that uses stop-start technology, all vehicles available for purchase could use this technology. It will provide consumers with more environmentally conscious choices without compromising vehicle performance, reliability or safety.
- Insulating consumers against rising fuel prices.
- Achieving greenhouse gas emissions savings over and above those committed to by the federal government.

Challenges

The public may need to overcome a number of roadblocks before fully embracing the concept of having to purchase a more fuel-efficient vehicle. Some of these barriers may include:

- Expecting that they absorb a higher cost for fuel-efficient vehicle technology. Anger from consumers who demand total control over all decisions. Some people may think that by limiting the choice of vehicles that are available that their rights are being violated. However, government regulations already require certain standards be upheld with regard to automotive safety and performance. Fuel efficiency should be considered as equivalent to these other areas. In Nova Scotia, a vehicle owner is required to have his or her vehicle pass safety regulation testing every two years. Fuel-efficiency standards should be seen as a similar measure.
- Adopting a fleet standard approach rather than an individual vehicle attribute approach.¹⁷⁰

¹⁶⁹ Government of British Columbia, Ministry of Environment (April 29, 2008). Backgrounder: GHG Gas Reduction (Vehicle Emissions Standards) Act. Retrieved from http://www2.news.gov.bc.ca/news_releases_2005-2009/2008ENV0049-000653-Attachment1.htm on March 25, 2010

¹⁷⁰ Rankin, C. & Associates. Vehicle Emissions Standards Regulations Under the Greenhouse Gas Reduction (Vehicle Emissions Standards) Act Policy Intentions Paper for Consultation Summary of Public Comment. Retrieved from [http://webcache.googleusercontent.com/search?q=cache%3AJq6GYEv5K5cJ%3Awww.env.gov.bc.ca%2Fepd%2Fcodes%2Fvehicle_emissions%2Fpdf%2Fggrves-paper.pdf+Vehicle+Emissions+Standards+R+egulations+Under+the+Greenhouse+Gas+Reduction+\(Vehicle+Emissions+Standards\)+Act+Policy+Intentions+Pa+per+for+Consultation+Summary+of+Public+Comment&hl=en&gl=ca](http://webcache.googleusercontent.com/search?q=cache%3AJq6GYEv5K5cJ%3Awww.env.gov.bc.ca%2Fepd%2Fcodes%2Fvehicle_emissions%2Fpdf%2Fggrves-paper.pdf+Vehicle+Emissions+Standards+R+egulations+Under+the+Greenhouse+Gas+Reduction+(Vehicle+Emissions+Standards)+Act+Policy+Intentions+Pa+per+for+Consultation+Summary+of+Public+Comment&hl=en&gl=ca) on April 12, 2010

Examples

Before implementing new policies or technologies, governments may prefer to look to other jurisdictions that have chosen to implement more stringent vehicle regulations. The following examples may help assuage doubts:

U.S. - Canadian Regulations

On April 1, 2010, the federal governments of Canada and the United States of America announced their intentions to adopt stricter vehicle standards. The proposed regulations would tighten greenhouse gas emission standards between the model years 2011 and 2016. The Canadian Government feels that this is “the next step” in the process that was initiated in April 2009.¹⁷¹ A background document prepared by Environment Canada states, “As a result of the proposed regulations, it is projected that the average GHG emission performance of new vehicles of the 2016 model year will be about 25 per cent lower than the vehicles that were sold in Canada in 2008”.¹⁷²

The new regulations may increase the cost of new vehicles. David Friedman, research director of the vehicles program at the Union of Concerned Scientists in Washington, says the increased price is justifiable.¹⁷³ Douglas Greenhaus, director of environment, health, and safety for the U.S. National Automobile Dealers Association, disagrees. He says, “Unless people buy these vehicles, none of the policy benefits will be achieved.”¹⁷⁴

The State of California

Beginning in 2002, California implemented stricter standards for vehicle emissions than did the U.S. federal government. If the April 2010 proposed regulations are adopted, California has agreed to adopt these new standards.¹⁷⁵ Therefore, there would be no discrepancy between California and the U.S. federal regulations.

171 Environment Canada (April 1, 2010) News Release: Canada and the United States Announce Common Standards for Regulating GHG Emissions from New Vehicles. Retrieved from <http://www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=B1DDFE4D-5147-46F9-BA97-BA1BDDC3B7A6> on April 1, 2010

172 Environment Canada (April 1, 2010) News Release: Canada and the United States Announce Common Standards for Regulating GHG Emissions from New Vehicles. Retrieved from <http://www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=B1DDFE4D-5147-46F9-BA97-BA1BDDC3B7A6> on April 1, 2010

173 Belsie, Laurent. Impact of emission caps: costlier cars that will be cheaper to drive. (2010). Retrieved at: <http://www.csmonitor.com/Money/new-economy/2010/0402/Impact-of-emission-caps-costlier-cars-that-will-be-cheaper-to-drive> on April 3, 2010

174 Belsie, Laurent. Impact of emission caps: costlier cars that will be cheaper to drive. (2010). Retrieved at: <http://www.csmonitor.com/Money/new-economy/2010/0402/Impact-of-emission-caps-costlier-cars-that-will-be-cheaper-to-drive> on April 3, 2010

175 Environment Canada. Backgrounder: Regulating GHG Emissions from New Vehicles in Canada. Retrieved from <http://www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=9CA6EB09-6F52-4C43-B8F7-BFE401D6EB29> on April 1, 2010

Quebec and British Columbia

When Quebec's new vehicle standards came into effect in January 2010, it was the first jurisdiction in Canada to hold new vehicles to stricter standards than the federal government. In a press release issued Dec. 29, 2009, the Quebec Minister of Sustainable Development, Environment and Parks, Line Beauchamp, expressed that the new regulations would align the province with the toughest jurisdictions in the U.S. in terms of vehicle emission standards:

This Government of Quebec measure is part of a North American movement that has seen some 15 American states, including a majority of Quebec's northeast neighbours, follow California's lead.¹⁷⁶

The province of British Columbia followed Quebec's lead. Again, if the new regulations for vehicle standards are adopted, these standards would apply to every Canadian province and every U.S. state, eliminating the need for separate regulations. Whether these standards are adopted will not be known until the regulation is put before the Canadian House of Commons in the summer of 2010.

Promotion of Electric Vehicles

At first, hybrid electric vehicles sound like the answer to the problems created by peak oil. In a province such as Quebec where the majority of power is generated by hydroelectric dams, that very well might be the case but in Nova Scotia which is still largely dependent on coal imports, hybrid electric vehicles simply reinforce the province's dependence on imported fuel.

6.4 Stop-start Technology

Explanation

People are generally leery of shutting their vehicle engines off at signalized intersections. They fear that their vehicle may get stuck. They do not trust that their ignition system will restart the engine without fail or they fear that multiple starts within a short period of time will eventually damage the ignition. However, today's fuel-injected engines ensure that neither of these incidents should occur.

Stop-start systems automatically turn a vehicle's engine off when the car comes to a complete stop. The motor is reignited when the accelerator is depressed. Stop-start technology is available on most hybrids and on at least one vehicle in the lineup of six separate vehicle manufacturers.

The United States Department of Energy describes stop-start technology as an energy conservation tool.¹⁷⁷ As such, mandating this type of technology on all vehicles would be a

¹⁷⁶ Government of Quebec (December 29, 2009). Quebec Applies the California Standards. Retrieved from http://www.mddep.gouv.qc.ca/communiqués_en/2009/c20091229-normescalif.htm on March 25, 2010

¹⁷⁷ United States Department of Energy. Retrieved from <http://www.fueleconomy.gov/feg/hybridAnimation/stopstart/stopstartoverview.html> on March 10, 2010

simpler way to achieve greenhouse gas reduction results than expecting individuals to change their driving habits.

Carrico *et al* write that five to eight per cent of fuel use in personal motor vehicles is due to idling.¹⁷⁸ This may be slightly higher than other estimates, but generally corresponds with other accounts.

Benefits

Documented evidence suggests the benefits of implementing stop-start technology are many. They include:

- Lowering noise pollution levels from running vehicles.¹⁷⁹
- Increasing fuel efficiency of vehicles. In urban areas, an automotive resource states that “vehicles are at a standstill for one-third of the time”.¹⁸⁰ By turning off the engine when stopped, fuel use is decreased by a minimum of one-third.
- Decreasing fuel use decreases emissions. Offers an immediate return for drivers, legislators, the environment and the community as a whole.¹⁸¹
- Increasing cost savings. A study by Motoda examines the difference between drivers operating a regular vehicle and vehicles with stop-start technology. A difference in fuel use of six per cent resulted from turning the engine off when the vehicle was not moving. This figure is obtained from averaging the fuel efficiency ratings from three different driving situations: “5.8 per cent in the total road, 13.4 per cent in the urban road, 3.4 per cent in the rural road”.¹⁸²

Challenges

The public may need to overcome a number of roadblocks before fully embracing stopping their engines at every red light. Some of these barriers may include:

- Purchasing technology is costly for the consumer. As was mentioned in the Vehicle Regulation section, if the technology is mandated on all new vehicles, it simply becomes part of the cost of doing business.

178 Amanda R. Carrico, Paul Padgett, Michael P. Vandenberg, Jonathan Gilligan, Kenneth A. Wallston. 2009. Costly myths: An analysis of idling beliefs and behavior in personal motor vehicles. *Energy Policy* 37: 2884

179 Just-Auto. Research Analysis: Review of stop-start systems (2009) Retrieved from <http://www.just-auto.com/article.aspx?id=101657&lk=s> on March 10, 2010

180 Just-Auto. Research Analysis: Review of stop-start systems (2009) Retrieved from <http://www.just-auto.com/article.aspx?id=101657&lk=s> on March 10, 2010

181 Motoda, Yoshitaka and Taniguchi Masaaki (2003) A Study on Saving Fuel by Idling Stops While Driving Vehicles Eastern Asia Society for Transportation Studies. P2 Retrieved from http://webcache.googleusercontent.com/search?q=cache%3ArI9oIM_IEBkJ%3Awww.eccj.or.jp%2Fidstop%2Feng%2Fdpeasts3.pdf+A+Study+on+Saving+Fuel+by+Idling+Stops+While+Driving+Vehicles&hl=en&gl=ca on April 12, 2010.

182 Motoda, Yoshitaka and Taniguchi Masaaki (2003) A Study on Saving Fuel by Idling Stops While Driving Vehicles Eastern Asia Society for Transportation Studies. P9 Retrieved from http://webcache.googleusercontent.com/search?q=cache%3ArI9oIM_IEBkJ%3Awww.eccj.or.jp%2Fidstop%2Feng%2Fdpeasts3.pdf+A+Study+on+Saving+Fuel+by+Idling+Stops+While+Driving+Vehicles&hl=en&gl=ca on April 12, 2010.

- Accepting new technology can be difficult. System engineers must refine stop-start technology so that it is reliable, quick to engage and otherwise flawless. Automatic transmission technology went through growing pains, but is now near standard equipment on many vehicles.
- Including alternative power systems needs to become a standard part of stop-start system manufacturing. Equipment such as climate controls, which are usually powered by the engine, need to have an alternative power source so that they are not adversely affected by turning off the engine.¹⁸³
- Needing to re-educate the public on the amount of fuel used in vehicle start up. Existing perceptions adhere to a belief that vehicles use more fuel upon restarting than is saved by shutting off the engine for 10 seconds. While this may have been the case in the past, Motoda reports that, "...recent vehicles that meet present regulations of exhaust emissions can save fuel by even short time idling stops".¹⁸⁴ Newly purchased vehicles should be required to have stop-start technology as standard equipment.
- Increasing confidence level of new drivers so they are comfortable manually turning a vehicle on and off at each intersection. New drivers may feel that needing to stop and restart the engine will cause traffic delays. This problem is avoided completely if stop-start technology is standard equipment.

Examples

In 2008, stop-start technology was found on approximately five per cent of vehicles made in Europe.¹⁸⁵ Some industry experts predict that this number will grow to 50 per cent by 2015. Other industry experts put the number at 20 per cent. Bernd Bohr, Chairman of automotive component company Bosch is reported to have said that stop-start technology is a better bet than hybrids and that stop-start systems will become "increasingly popular".¹⁸⁶

183 Hybrid Car Review (July 24, 2008) Start Stop Technology Will be Everywhere. Retrieved from <http://hybridreview.blogspot.com/2008/07/start-stop-technology-will-be.html> on March 10, 2010

184 Motoda, Yoshitaka and Taniguchi Masaaki (2003) A Study on Saving Fuel by Idling Stops While Driving Vehicles Eastern Asia Society for Transportation Studies. P9 Retrieved from http://webcache.googleusercontent.com/search?q=cache%3ArI9oIM_IEBkJ%3Awww.eccj.or.jp%2Fidstop%2Feng%2Fdpeasts3.pdf+A+Study+on+Saving+Fuel+by+Idling+Stops+While+Driving+Vehicles&hl=en&gl=ca on April 12, 2010.

185 Just-Auto. Research Analysis: Review of stop-start systems (2009) Retrieved from <http://www.just-auto.com/article.aspx?id=101657&lk=s> on March 10, 2010

186 EGM CarTech (June 14, 2007) 20% of all cars to have stop-start by 2015. Retrieved from <http://www.egmcartech.com/2007/06/14/20-of-all-cars-to-have-stop-start-by-2015/> on March 10, 2010

This will be driven by Europe's need to reach its climate change commitments. In North America, top environmentalists for vehicle manufacturers feel the same way.¹⁸⁷ Stop-start systems offer a relatively easy way for people to meet climate change commitments without needing to change their behaviour. Vehicle manufacturers are now making stop-start technology available. For example, Toyota has added stop-start technology to its Auris model. Kia's manufacturing plant in Zilina, Slovakia has added a stop-start technology to six of its vehicles.¹⁸⁸ As stop-start technology becomes standard equipment, fuel emissions will decline.

Legislation to Turn Vehicles Off at Traffic Lights

Cities in both England and Japan have flirted with the idea of legislation that would require drivers to turn their vehicles off at traffic lights. In Japan, even without legislation, four per cent of people turn off their vehicles while driving.¹⁸⁹ However, many more people are scared to turn off their vehicles while driving for the following reasons, "...starting time lag (48 per cent), short lifetime of starters (41 per cent), suspicious effect (40 per cent), suspicious safety (39 per cent), and troublesome ignition key actions (38 per cent)".¹⁹⁰ In England, the cities of Cambridge, Birmingham and Bristol all looked into the issue, but no by-law could be found for any of the cities.¹⁹¹ Attempts to contact the cities were unsuccessful.

Natural Resources Canada does not recommend legislating that engines be turned off at traffic lights. Quoted in an article by Canwest News Service, Catherine Ray an analyst at Natural Resources Canada who has studied idling for over a decade, states that, "The government does not recommend that people turn their engine off and on if they are stuck in traffic..."¹⁹² No explanation for the government's position could be found.

The Nikkei, a Japanese newspaper, reports that NTT Group companies have begun retrofitting their service vehicles with a stop-start device. NTT will install the idling-stop devices in around 800 of its group's fleet vehicles in 2010. Trials of the device in Tokyo indicate an improvement in mileage of between 10 and 25 per cent.¹⁹³

187 Hybrid Car Review (July 24, 2008) Start Stop Technology Will be Everywhere. Retrieved from <http://hybridreview.blogspot.com/2008/07/start-stop-technology-will-be.html> on March 10, 2010

188 Just-Auto. Research Analysis: Review of stop-start systems (2009) Retrieved from <http://www.just-auto.com/article.aspx?id=101657&lk=s> on March 10, 2010

189 Motoda, Yoshitaka and Taniguchi Masaaki (2003) A Study on Saving Fuel by Idling Stops While Driving Vehicles Eastern Asia Society for Transportation Studies. Retrieved from http://webcache.googleusercontent.com/search?q=cache%3ArI9oIM_IEBkJ%3Awww.eccj.or.jp%2Fidstop%2Feng%2Fdpeasts3.pdf+A+Study+on+Saving+Fuel+by+Idling+Stops+While+Driving+Vehicles&hl=en&gl=ca on April 12, 2010

190 Motoda, Yoshitaka and Taniguchi Masaaki (2003) A Study on Saving Fuel by Idling Stops While Driving Vehicles Eastern Asia Society for Transportation Studies. Retrieved from http://webcache.googleusercontent.com/search?q=cache%3ArI9oIM_IEBkJ%3Awww.eccj.or.jp%2Fidstop%2Feng%2Fdpeasts3.pdf+A+Study+on+Saving+Fuel+by+Idling+Stops+While+Driving+Vehicles&hl=en&gl=ca on April 12, 2010

191 Massey, R. (2002). Stuck at the lights? Switch the engine off or we'll fine you. The Free Library. Retrieved from <http://www.thefreelibrary.com/Stuck+at+the+lights%3F+Switch+the+engine+off+or+we'll+fine+you.-a088191668> on April 2, 2010.

192 Canwest News Services (2008) Most drivers think idling uses less gas: survey. Retrieved from <http://www.driving.ca/news/story.html?id=5b1372b7-668b-4317-b7cd-0f12f0993339> on April 3, 2010.

193 Green Car Congress (November 12, 2009) NTT Group Retrofitting Fleet Vehicles with Stop-Start Device.

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Retrieved at: <http://www.csmonitor.com/Money/new-economy/2010/0402/Impact-of-emission-caps-costlier-cars-that-will-be-cheaper-to-drive> on April 3, 2010

Canwest News Services (2008) Most drivers think idling uses less gas: survey. Retrieved from <http://www.driving.ca/news/story.html?id=5b1372b7-668b-4317-b7cd-0f12f0993339> on April 3, 2010

Carrico, Amanda R., Paul Padgett, Michael P. Vandenberg, Jonathan Gilligan, and Kenneth A. Wallston (2009) Costly myths: An analysis of idling beliefs and behavior in personal motor vehicles. *Energy Policy* 37: 2881-2888.

EGM CarTech (June 14, 2007) 20 per cent of all cars to have stop-start by 2015. Retrieved from <http://www.egmcartech.com/2007/06/14/20-of-all-cars-to-have-stop-start-by-2015/> on March 10, 2010

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Environment Canada (April 1, 2010) News Release: Canada and the United States Announce Common Standards for Regulating GHG Emissions from New Vehicles. Retrieved from <http://www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=B1DDFE4D-5147-46F9-BA97-BA1BDDC3B7A6> on April 1, 2010

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Retrieved from www.greencarcongress.com/2009/11/ntt-idle-20091112.html on March 10, 2010

Government of Quebec (December 29, 2009). Quebec Applies the California Standards. Retrieved from http://www.mddep.gouv.qc.ca/communiqués_en/2009/c20091229-normescalif.htm on March 25, 2010

Green Car Congress (November 12, 2009) NTT Group Retrofitting Fleet Vehicles with Stop-Start Device. Retrieved from www.greencarcongress.com/2009/11/ntt-idle-20091112.html on March 10, 2010

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Just-Auto. Research Analysis: Review of stop-start systems (2009) Retrieved from <http://www.just-auto.com/article.aspx?id=101657&lk=s> on March 10, 2010

Massey, R. (2002). Stuck at the lights? Switch the engine off or we'll fine you. The Free Library. Retrieved from <http://www.thefreelibrary.com/Stuck+at+the+lights%3F+Switch+the+engine+off+or+we'll+fine+you.-a088191668> on April 2, 2010.

Motoda, Yoshitaka and Taniguchi Masaaki (2003) A Study on Saving Fuel by Idling Stops While Driving Vehicles Eastern Asia Society for Transportation Studies. Retrieved from http://webcache.googleusercontent.com/search?q=cache%3Arl9oIM_1EBkJ%3Awww.eccj.or.jp%2Fidstop%2Feng%2Fdpeasts3.pdf+A+Study+on+Saving+Fuel+by+Idling+Stops+While+Driving+Vehicles&hl=en&gl=ca on April 12, 2010

Rankin, C. & Associates. Vehicle Emissions Standards Regulations Under the Greenhouse Gas Reduction (Vehicle Emissions Standards) Act Policy Intentions Paper for Consultation Summary of Public Comment. Retrieved from [http://webcache.googleusercontent.com/search?q=cache%3AJq6GYEv5K5cJ%3Awww.env.gov.bc.ca%2Fepd%2Fcodes%2Fvehicle_emissions%2Fpdf%2Fggrves-paper.pdf+Vehicle+Emissions+Standards+Regulations+Under+the+Greenhouse+Gas+Reduction+\(Vehicle+Emissions+Standards\)+Act+Policy+Intentions+Paper+for+Consultation+Summary+of+Public+Comment&hl=en&gl=ca](http://webcache.googleusercontent.com/search?q=cache%3AJq6GYEv5K5cJ%3Awww.env.gov.bc.ca%2Fepd%2Fcodes%2Fvehicle_emissions%2Fpdf%2Fggrves-paper.pdf+Vehicle+Emissions+Standards+Regulations+Under+the+Greenhouse+Gas+Reduction+(Vehicle+Emissions+Standards)+Act+Policy+Intentions+Paper+for+Consultation+Summary+of+Public+Comment&hl=en&gl=ca) on April 12, 2010

United States Department of Energy. Retrieved from <http://www.fueleconomy.gov//feg/hybridAnimation/stopstart/stopstartoverview.html> on March 10, 2010

7.0 Evaluating Idling Reduction Options

The information presented in this report offers numerous solutions to the problem of needless idling. The solutions are geared towards both municipal and provincial-level decision makers as well as the staff who direct programs and personnel.

7.1 Reaching the Target

Given that the need to reduce greenhouse gases is clear, the question is how to best achieve these reductions. The options presented in the report have been compiled into a chart found in Appendix E. The options for idling reduction separated into the five chapters are:

Education:

- Incentives to Act
- Fleet Driver Re-education
- Fleet Challenges
- Commitments and Pledges

Policy:

- Idling Control Policy
- Right-sizing Fleets
- Alternative Fuels
- Setting a Target
- Fleet Management and Vehicle Maintenance

Regulation:

- Idling Restriction By-laws
- Land-use Restrictions

Managing Traffic Flow:

- Roundabouts
- Traffic Signal Synchronization
- Creating Caution: Naked Streets, Removal of Lights, Use of Yield Signs

Vehicle Standards:

- Vehicle Regulations
- Stop-start Technology

The six criteria used to evaluate these opportunities are:

- Purpose (of the idling restriction measure)
- Publics Reached (what segments of the population is the measure geared towards)
- Initial Cost (what level of investment is needed to employ this opportunity)
- Time til Savings (when does the opportunity result in greenhouse gas emission savings)
- Type (what type of campaign is to be initiated. Categories used are behavioural - information campaign, management - requires support at a bureaucratic or corporate level, legislative - requires the leadership of town council or of another government level, and structural - requires a shift to constructing a community in a different way)

- Jurisdiction (what level of government can initiate a change)

A seminal work by York *et al.* outlines the need to evaluate environmentally-driven behaviour change models by two criteria: elasticity and plasticity.¹⁹⁴ Following York's work, Carrico *et al.* explain:

When this logic is applied to the issue of behavioural sources of emissions, elasticity can be conceptualized as the level of CO2 emissions associated with a given behaviour, and plasticity as the capacity for producing a meaningful level of behaviour change within a given time frame.¹⁹⁵

Elasticity was not included as a measure of evaluating opportunities; the savings that each opportunity affords is highly contextual. For an education program the number of people reached is fundamental. For the use of roundabouts, it depends on the number of vehicles travelling through it; for a four-way stop converted to yield signs, the congestion of the intersection will determine the greenhouse gas savings. Until the exact situation where the opportunity would be used is decided, it is impossible to estimate greenhouse gas savings. However, plasticity has been included in the evaluation system with the level of potential ranked as high, moderate or low.

The opportunities chart allows users to understand at a glance the options for reducing needless idling.

194 Carrico, Amanda R. and Paul Padgett, Michael P. Vandenberg, Jonathan Gilligan, Kenneth A. Wallston. (2009) Costly myths: An analysis of idling beliefs and behavior in personal motor vehicles. *Energy Policy* 37: 2881-2888.

195 Carrico, Amanda R. and Paul Padgett, Michael P. Vandenberg, Jonathan Gilligan, Kenneth A. Wallston. (2009) Costly myths: An analysis of idling beliefs and behavior in personal motor vehicles. *Energy Policy* 37: 2881-2888.

Appendix A

Appropriate and Inappropriate Uses of Roundabouts

The following information can be found at:

Jacquemart, Georges for National Cooperative Highway Research Program (1998) Synthesis of Highway Practice 264: Modern Roundabout Practice in the United States. Retrieved from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_264.pdf on March 1, 2010.

Appropriate Locations and Conditions

- High accident locations, especially locations with high accidents related to cross movements or left-turn or right-turn movements.
- Locations with high delays.
- Locations where traffic signals are not warranted.
- Four-way stop intersections.
- Intersections with more than four legs.
- Intersections with unusual geometry (Y-intersections or acute-angle cross intersections).
- Intersections with high left-turn flows.
- Intersections with changing traffic patterns.
- Intersections where U-turns are frequent or desirable, i.e., in conjunction with access management strategies (raised median) along commercial corridors.
- At locations where storage capacities for signalized intersections are restricted, or where the queues created by signalized intersections cause operational or safety problems, i.e. diamond interchanges, intersections near rail underpasses, bridges, and tunnels.
- To replace a pair of closely spaced intersections.
- Along congested arterials, in lieu of full-length road widening.
- Intersections where the character or speed of the road changes, e.g., at entry points to a community or at junctions where a bypass road connects to an arterial.
- Intersections that are important from an urban design or visual point of view (as long as the basic engineering and safety criteria can be satisfied).

Inappropriate Locations and Conditions

The following conditions are generally mentioned as being unfavourable for roundabouts:

- Locations where there is insufficient space for an acceptable outside diameter. Single-lane roundabouts generally consume more space than equivalent signalized intersections at the junction itself, but their approaches are often narrower. Multi-lane roundabouts compare more favourably in terms of space consumption.
- Locations where it would be difficult to provide a flat plateau for the roundabout construction. Most guides recommend maximum grades of three to five per cent depending on design speed.
- Locations within a coordinated signal network, where the roundabout would disrupt the platoons.
- Locations with heavy flows on the major road and low flows on the minor road, where the

equal opportunity treatment of the approaches causes undue delays to the major road. Other conditions are sometimes mentioned as potentially problematic; however, they do not necessarily eliminate the roundabout as an improvement alternative. As for any other intersection, these conditions need special attention regarding design and operational aspects, and a detailed analysis of alternatives is required. Such conditions include:

- Presence of numerous bicycles or pedestrians. These can be addressed through special design features such as separate bicycle lanes, zebra striping, pedestrian underpasses, or pedestrian-activated signals farther away from the roundabout.
- Presence of numerous disabled and blind users. Provision of special surface treatment should be considered to mark the pedestrian paths. Pedestrian activated signals with audible messages can be considered.
- Large proportion of heavy vehicles. These can be addressed through more generous dimensions.
- Presence of fire station. Similar design precautions are taken as with signalized intersections. Special signals can be set up.
- Rail crossings. Precautions are taken similar to other intersections.
- Junction at top or bottom of grade. If the sight distances at the approaches are not adequate, special advance signs or signals need to be installed.
- Proximity of adjacent signals. Undisciplined drivers may block a roundabout as they do at a signalized intersection. Most of the guidelines (3, 10-12, 17-21, 23, 29) describe appropriate locations or conditions for roundabout installation, listed as follows:
 - High accident locations, especially locations with high accidents related to cross movements or left-turn or right-turn movements.
 - Locations with high delays.
 - Locations where traffic signals are not warranted.
 - Four-way stop intersections.
 - Intersections with more than four legs.
 - Intersections with unusual geometry (Y-intersections or acute-angle cross intersections).
 - Intersections with high left-turn flows.
 - Intersections with changing traffic patterns.
 - Intersections where U-turns are frequent or desirable, i.e., in conjunction with access management strategies (raised median) along commercial corridors.
 - At locations where storage capacities for signalized intersections are restricted, or where the queues created by signalized intersections cause operational or safety problems, i.e. diamond interchanges, intersections near rail underpasses, bridges, and tunnels.
 - To replace a pair of closely spaced intersections.
 - Along congested arterials, in lieu of full-length road widening.
 - Intersections where the character or speed of the road changes, e.g., at entry points to a community or at junctions where a bypass road connects to an arterial.
 - Intersections that are important from an urban design or visual point of view (as long as the basic engineering and safety criteria can be satisfied).
 - Locations where there is insufficient space for an acceptable outside diameter. Single-lane roundabouts generally consume more space than equivalent signalized intersections at the

junction itself, but their approaches are often narrower. Multi-lane roundabouts compare more favourably in terms of space consumption.

- Locations where it would be difficult to provide a flat plateau for the roundabout construction. Most guides recommend maximum grades of three to five per cent depending on design speed.
- Locations within a coordinated signal network, where the roundabout would disrupt the platoons.
- Locations with heavy flows on the major road and low flows on the minor road, where the equal opportunity treatment of the approaches causes undue delays to the major road. Other conditions are sometimes mentioned as potentially problematic; however, they do not necessarily eliminate the roundabout as an improvement alternative. As for any other intersection, these conditions need special attention regarding design and operational aspects, and a detailed analysis of alternatives is required.

Appendix B Drafting Idling Restriction By-laws

Example of a by-law drafted for the Town of Antigonish:

IDLING CONTROL BY-LAW

Preamble

WHEREAS Section 172 of the *Municipal Government Act* authorizes the Town to regulate with respect to the health, well being, safety and protection of persons from nuisances, activities and things that, in the opinion of Council, may be or may cause nuisances, including odours, fumes and noise; AND WHEREAS motor vehicles are sources of particulate matter, nitrogen oxide, carbon monoxide, sulphur oxide, volatile organic compounds, greenhouse gas emissions and excess auditory vibrations; AND WHEREAS such emissions have negative affects on local, regional and global Climate, air quality and quality of life and, as such, constitute a nuisance and negatively affect the health safety and well-being of residents of the Town of Antigonish; THEREFORE the Council of the Town of Antigonish enacts this By-law.

Short title

1. This by-law may be cited as the “**Idling Control By-law**”.

Definitions

2. In this By-law:

- (a) “**idle**” means the operation of a Vehicle’s internal combustion engine while the vehicle is stationary; “idling” has a corresponding meaning;
- (b) “**Public Transport Vehicle**” means a bus or van, other than one being operated as a taxi, for the conveyance of passengers from any point within the Town to any point either within or outside of the Town;
- (c) “**Vehicle**” means any motorized vehicle but does not include any vehicle designed to run exclusively on rails.
- (d) “**Town**” or “**Town of Antigonish**” means the jurisdictional region of the Town of Antigonish in Nova Scotia, Canada;
- (e) “**Peace Officer**” means a member of the Royal Canadian Mounted Police; a member of a community or regional police service or a special constable;
- (f) “**Person**” means an individual, society, partnership or corporation;
- (g) “**Work**” means, in respect of an internal combustion engine operating in a stationary Vehicle or in stationary Mobile Equipment, the powering of equipment or apparatus engaged in: the operation of any Vehicle held stationary by a Traffic Control Device; necessary operations for the loading or unloading of Mobile Equipment or a Commercial Vehicle; providing heating, air-conditioning or refrigeration necessary for the preservation of perishable goods or cargos

carried by or contained in a Commercial Vehicle or an Emergency Vehicle; maintaining emergency lights, communications equipment, computer equipment or other emergency equipment, whether in respect of an Emergency Vehicle or not, during any time the operator or passengers of such Vehicle are involved in a response to an emergency or, in the case of an Emergency Vehicle, at any time the operator or passengers of such Vehicle are involved in training for emergency responses; maintaining emergency lights, communications equipment, computer equipment or other emergency equipment in respect of a Vehicle operated by a Peace Officer during his or her duties at any time such Peace Officer is involved in a law enforcement activity; operating systems or equipment necessary for the secure functioning of armoured Vehicles; excavation, winching, hauling, lifting, lowering, erecting, mixing, cleaning, painting, pouring, pumping, packing, tamping, cutting, or other similar activities; delivering necessary medical care to a Vehicle occupant; maintaining interior temperatures in a Commercial Passenger Vehicle engaged in embarking or disembarking passengers; or removing frost, mist or condensation present on the windshield of a Vehicle or Mobile Equipment.

Words importing the masculine gender only include the feminine gender and vice versa whenever the context so requires; and words importing the singular shall include the plural and vice versa whenever the context so requires.

General Prohibitions

2. No person shall cause or permit a Vehicle to idle in the Town of Antigonish.

Exemptions

4. It shall be a defence to a charge pursuant to section 3 of this By-law if the Vehicle was:

- (a) engaged in an activity justified under the “work” provision as found in the definition section
- (b) idling for a purpose required by provincial or federal legislation;

Offences

- (a) Any Person who contravenes this By-law is guilty of an offence and is liable on summary conviction to a fine of not less than \$150.00 and not more than \$10,000. This amount is provided for by the *Provincial Offences Procedure Act* (Nova Scotia) as amended.

(b) A notice of form commonly called an Offence Ticket having printed wording approved by the Municipal Manager, may be issued by a Peace Officer or a Municipal Compliance Officer to any Person alleged to have breached any provision of this By-law, and the said notice shall require the payment to such official in the amount specified in this By-law or the *Traffic Safety Act*, (Alberta), as amended or the regulations pursuant to the *Provincial Offences Procedure Act* (Alberta), as amended.

(c) When a Person is served with an Offence Ticket pursuant to Section 16.3 of this By-law and the recipient of the Offence Ticket voluntarily delivers payment to

the Municipal Manager of the Town within fourteen (14) days of the date the Offence Ticket is issued, the specified penalty shall be reduced by ten (10) per cent.

(d) An Offence Ticket shall be deemed to be sufficiently served: if served personally on the accused; if mailed to the address of the registered Owner of the Vehicle concerned; or to the Person concerned; or if attached to or left securely and visibly upon a Vehicle in respect of which an offence is alleged to have been committed.

Administration and Enforcement

5. The By-law shall be administered and enforced by any Peace Officer employed by the Town of Antigonish and any Town employee appointed to do so by the Chief Administrative Officer of the Town.

Appendix C
HRM's Right-Sizing Policy

<http://www.halifax.ca/council/agendasc/documents/090707ca1115.pdf>

Appendix D By-Law Considerations

Power to enact idling restriction by-laws

Two approaches to enacting idling restriction by-laws at a municipal level exist. By-laws can be justified by two portions of the *Municipal Government Act*:

- With the objective of reducing emissions. As creatures of the province, municipalities have been given power to regulate for the health of their citizens. The *Municipal Government Act* outlines the purpose of municipalities in Section 2. In this section, clause C states:

(c)... that the functions of the municipality are to

- (i) provide good government,
- (ii) provide services, facilities and other things that, in the opinion of the council, are necessary or desirable for all or part of the municipality, and
- (iii) develop and maintain safe and viable communities.¹⁹⁶

It would be difficult to argue that protecting air quality is not a measure that falls under working to benefit the health of the population. Section 2 seems to give broad authority to Council to act in a manner that is consistent with ecologically sound principles.

- With the objective of reducing/avoiding nuisance. The main objective of idling restriction can be to reduce the noise caused by idling vehicles. Council is granted the power for this action through Section 172, which reads:

172 (1) A council may make by-laws, for municipal purposes, respecting ...

- (d) nuisances, activities and things that, in the opinion of the council, may be or may cause nuisances, including noise, weeds, burning, odours, fumes and vibrations ...¹⁹⁷

Both rationales work to reduce idling but should be marketed in different ways; the first is about health and a reduction in greenhouse gas emissions while the second is strictly about the quality of life for a property owner. The by-laws can have the same effect but will be applied with a different rationale. The elements of the by-laws differ slightly. *The Canadians Idle-Less* project recommends adopting a stand-alone by-law based on health principles. Stand-alone by-laws are more convenient to administer and are more accessible to the public. Nuisance by-laws are often multi-faceted and will include idling reductions with other noxious gas and pesticide restrictions.

¹⁹⁶ Province of Nova Scotia. (1998). *Municipal Government Act*. Section 2. Retrieved from <http://www.gov.ns.ca/legislature/legc/statutes/muncpgov.htm> on August 16, 2009.

¹⁹⁷ Province of Nova Scotia. (1998). *Municipal Government Act*. Section 172. Retrieved from <http://www.gov.ns.ca/legislature/legc/statutes/muncpgov.htm> on August 16, 2009.

Elements of a by-law

Key features of stand-alone by-laws are:

- Legal basis of the by-law
- Rationale for the by-law
- Definitions of terms
- General provisions of the by-law
- Exemptions from the by-law
- Administrative and enforcement provisions
- Enactment

Key features of idling restriction provisions incorporated in noise, nuisance and other by-laws:

- Legal basis of the by-law
- Rationale of the by-law
- Definitions of terms
- General provisions
- Exemptions from the by-law
- Administrative and enforcement provisions
- Enactment

- **Legal basis**

The power for a municipality to make by-laws is found in the *Municipal Government Act* (MGA). These powers are granted by the province of Nova Scotia and apply to all incorporated municipal bodies.

For a by-law promoting greenhouse gas reduction:

172 (1) A council may make by-laws, for municipal purposes, respecting
(a) the health, well being, safety and protection of persons;¹⁹⁸

For a by-law under the nuisance provision:

172 (d) nuisances, activities and things that, in the opinion of the council, may be or may cause nuisances, including noise, weeds, burning, odours, fumes and vibrations ...

(vi) providing that it is an offence to engage in any activity that unreasonably disturbs or tends to disturb the peace and tranquility of a neighbourhood;¹⁹⁹

Though municipalities from across the nation (including 14 in Ontario alone) have implemented idling restriction by-laws in the name of good health, other cities are leery to do this. In the *Clean Air Strategy*, Halifax Regional Municipality writes that although air quality is technically under federal and provincial jurisdiction, it feels that given its mandate to act for the good health of its citizens it has the right to regulate emissions. HRM writes:

_____ Despite the fact that the HRM does not have a delegated mandate to manage

198 Province of Nova Scotia (1998) Municipal Government Act 172. "Power to Make By-Laws." Retrieved from <http://www.gov.ns.ca/legislature/legc/statutes/muncpgov.htm> on December 19, 2009

199 Province of Nova Scotia (1998) Municipal Government Act 172. "Power to Make By-Laws." Retrieved from <http://www.gov.ns.ca/legislature/legc/statutes/muncpgov.htm> on December 19, 2009

air quality, which is the responsibility of the federal and provincial governments, it has a responsibility to its residents to ensure that the environment in which they live is clean and does not pose a threat to their well-being. Within this context it has been proposed that HRM investigate an Air Quality By-Law, particularly to ensure that local air quality issues are adequately addressed.²⁰⁰

Despite jurisdictional issues, HRM has justified becoming involved in the idling issue because of the powers it has been granted by the Province of Nova Scotia.

- **Rationale**

The rationale section of a by-law will depend on the main goal of enacting the by-law, whether it is for air quality and health or to reduce disturbances. *Canadians Idle-Less* favours stand-alone by-laws that emphasize a reduction in greenhouse gas emissions and energy use. The Natural Resources Canada website gives the following rationale for enacting a by-law: “Unnecessary vehicle idling is a big problem in Canada – it wastes fuel and money, and damages the environment”²⁰¹. Idling restriction by-laws signal Council’s leadership on climate change to municipal residents.

- **Definitions of terms**

The municipality must include definitions of terms used in the by-law in order for the document to be complete and legible.

Idle means the operation of the engine of a vehicle while the vehicle is not in motion and not being used to operate auxiliary equipment that is essential to the basic function of the vehicle and “idling” has a corresponding meaning.²⁰²

Vehicle means a motor vehicle, trailer, tractor engine, farm tractor, or road building machines as defined in the *Highway Traffic Act* and any vehicle drawn, propelled or driven by any kind of non-muscular power.²⁰³

- **General provisions**

The central provision to an idling restriction by-law is the amount of time a vehicle can idle continuously to be in violation. Early by-laws such as the 2004 incarnation of the Burlington, Ontario by-law specified three minutes of idling. When the city of Burlington rewrote its by-law in 2009 the idling time was reduced to one minute. When the Municipality of Jasper, Alberta wrote its idling restriction by-law, no acceptable idling time was provided -- idling is not accepted at any time.

Natural Resources Canada recommends a time limit of one minute before idling restrictions take effect. Scientific research states that ten seconds of idling is all that is required for circulation of engine fluids prior to driving. A by-law should specify that the idling must be continuous. It is often stated that a vehicle can idle for no more than a certain

200 Halifax Regional Municipality. (April 2006). Clean Air Strategy: Framework Document. Executive Summary. Page 1.

201 Natural Resources Canada (2008) “Your Personal Five-Step Action Plan” Retrieved from <http://oee.nrcan-rncan.gc.ca/transportation/idling/material/personal-idling-plan.cfm?attr=8> on December 19, 2009

202 Town of Huntsville. (2003.) By-law Number 2003-145. Definitions.

203 Town of Huntsville. (2003.) By-law Number 2003-145. Definitions.

number of minutes within a 60-minute period.

Traditional wisdom holds that at least three minutes of idling is required to “warm up” a vehicle’s engine. While it is true that vehicles don’t reach optimum engine performance until one to three minutes after starting, it must be one to three minutes of driving rather than of idling in one position. Vehicle engines reach their optimum after the lubrication of engine and drive components that can only occur when the vehicle is in motion.

- **Exemptions**

The inclusion of exceptions makes the by-law more difficult to enforce. However, certain situations may require that idling occur in order to perform certain operational requirements. In these circumstances idling is not “unnecessary” but are justified. These situations may include:

- a) Medical exemptions for certain health conditions that require a certain consistency in temperature or humidity
- b) Temperature - Temperature considered should be the ambient temperature on the inside of the vehicle, which is impossible to enforce. Burlington dropped its temperature exemption because it made enforcement difficult. This exemption is based on operator and passenger comfort. In discussions with the Municipality of Jasper, which has no acceptable idling, it was stated that enforcement of temperature regulations are simply a matter of common sense. If extreme weather events occur, officers enforcing the by-law should consider the health of vehicle occupants.
- c) Emergency vehicles responding to a situation - the need for lighting and other equipment may require power from a vehicle’s engine.
- d) Equipment operation - Vehicles that require idling for the operation of equipment that is fundamental to their purpose
- e) Safety - Service vehicles that require idling for personnel safety and security (armoured trucks)
- f) Transit vehicles with passengers on board - May have different provisions for driver and for passengers. (For example, Metro Transit vehicles require one minute of operation before departing in order for hydraulic system to function properly.)
- g) Vehicles at Drive-throughs - Some municipalities are willing to grant vehicles in a drive-through lane permission to idle but other communities restrict the placement of drive-throughs or expect drive-through owners to use signage to display time remaining before orders are ready. (For example, Burlington closes drive-throughs on smog alert days. It recognizes that the amount of idling occurring at drive-throughs is problematic. Other locales such as neighbourhoods in Calgary and North Vancouver have banned the development of new drive-throughs.)
- h) Traffic situations - Vehicles standing as a result of an emergency, traffic, weather conditions, a funeral or mechanical difficulties over which the driver has no control;
- i) Special event - Vehicles engaged in the course of a parade or race;
- j) Maintenance - Vehicles idling for the purpose of being mechanically maintained or fixed;
or
- k) Clearing windshields - Vehicles engaged in de-icing windshields, only after the

windshields have been manually scraped, should be granted an idling time extension. In Section 184 (4) of the Nova Scotia *Motor Vehicle Act*, it stipulates that it is illegal to operate a vehicle with any non-transparent material covering a windshield:

No person shall on any highway drive a motor vehicle when there is in or upon the windshield, sidewings, side or rear windows, or the openings for the same or any of them, any sign, poster or other nontransparent material ...²⁰⁴

- **Administrative and Enforcement provisions**

Most municipalities have found enforcement of an idling restriction by-law difficult. It is unrealistic to expect a busy police or by-law enforcement officer to wait for three minutes to elapse in order to “catch” a vehicle operator in the act of idling. A number of other approaches to enforcement are:

- a) Complaint based - An individual calls to report a vehicle idling. An officer then responds. This method has not been effective because in the time between the call being placed and the time when the officer arrives on site the vehicle has often moved or been turned off. If the person with the complaint records the license plate of the offender, an information package or warning can be issued.
- b) Enforcement blitzes - Through a media campaign, enforcement officers “warn” the public of a clamp down on offensive behaviour. Though this may not actually result in additional tickets or fines, bringing the issue into the public eye is important for affecting behaviour.
- c) Warning/information pamphlets - Rather than wait to nab an offender, enforcement officers can take a proactive approach to idling restriction and issue warnings rather than fines. Warnings do not require that all conditions for an actual ticket be met but they remind the public of the by-law and of an individual’s offending behaviour.
- d) Actual tickets or fines - Within the community of Kentville, Nova Scotia any police officer or authorized individual can hand out violations. In certain other municipalities the privilege of issuing tickets lies solely with the police or RCMP. Some municipalities deal with the tickets as an offence akin to a parking ticket; others require an appearance in court.

- **Enactment**

A community best receives idling restriction by-laws when the measure is part of a larger climate change campaign. Hamilton, Ontario’s by-law details the “Idling Stinks” campaign. The by-law was enacted in conjunction with an education component.²⁰⁵ Nova Scotians are concerned about the state of the environment and the amount of greenhouse gas emissions as well as how rising sea levels affect the coastline. If the idling restriction by-law is marketed as an effort to prevent catastrophic climate and shoreline change, it will be better received. The by-law may also be promoted as an energy reduction technique. Examples of cities that have implemented idling restriction by-laws are Kentville, Jasper and Burlington.

204 Province of Nova Scotia. (1989) Motor Vehicle Act. Section 184 (4). Retrieved from <http://www.gov.ns.ca/legislature/legc/statutes/motorv.htm> on February 25, 2010

205 City of Hamilton. (2007.) Hamilton Idling Awareness Campaign and Control By-law

Appendix E

Chart Evaluating Idling Reduction Opportunities

Appendix E

Opportunity	Jurisdiction	Type	Time to Savings	Initial Cost	Reached	Purpose	Plasticity
Education							
Incentives to Act	all levels	Behaviour	Immediate	Minimal	Broad	Foundational	moderate
Fleet Driver Re-Education	all levels	Behaviour	Immediate	Minimal	Targeted	Foundational	high
Fleet Challenges	all levels	Behaviour	Immediate	Minimal	Targeted	Foundational	high
Commitments/Pledges	all levels	Behaviour	Immediate	Minimal	Targeted	Foundational	moderate
Policy							
Idling Control Policy	all levels	Management	Immediate	Minimal	Targeted	Messaging	moderate
Right-Sizing Fleets	all levels	Management	Medium-term	Minimal	Targeted	Operational	moderate
Alternative Fuels	all levels	Management	Immediate	Variable	Targeted	Operational	moderate
Setting a Target	all levels	Management	Immediate	Minimal	Broad	Messaging	moderate
Fleet Management	all levels	Management	Immediate	Minimal	Targeted	Operational	moderate
Regulation							
Idling Restrictions By-laws	municipal	Legislative	After adoption	Minimal	Broad	Messaging	high
Land-use Restrictions	municipal	Legislative	Longer-term	Minimal	Broad	Operational	low
Managing Traffic Flow							
Roadabouts	municipal	Structural	Medium-term	Significant	Broad	Operational	high
Signal Synchronization	municipal	Structural	Immediate	Ongoing	Broad	Operational	moderate
Creating Caution	municipal	Structural	Medium-term	Variable	Broad	Operational	moderate
Vehicle Standards							
Vehicle Regulations	federal	Legislative	Longer-term	Minimal	Broad	Operational	high
Stop-start Technology	federal	Legislative	Longer-term	Variable	Broad	Operational	high

Chart Evaluating Idling Reduction Opportunities

(Footnotes)

1 Mandavilli, Srinivas, Eugene R. Russell and Margaret J. Rys (2003) Operational Efficiency of Roundabouts. Retrieved from http://www.urbanstreet.info/2nd_sym_proceedings/Volume%202/Russell.pdf on February 21, 2010

2 Gourlay, Chris (September 6, 2009) Councils to cut crashes with 'naked streets'. Times Online Retrieved from <http://www.timesonline.co.uk/tol/news/politics/article6823324.ece> on March 7, 2010