



P.O. Box 1749
Halifax, Nova Scotia
B3J 3A5 Canada

Item No. 10.1
Halifax Regional Council
March 5, 2019
March 26, 2019

TO: Mayor Savage and Members of Halifax Regional Council

Original Signed

SUBMITTED BY: _____
Councillor Lorelei Nicoll, Chair, Transportation Standing Committee

DATE: February 25, 2019

SUBJECT: Update on HRM's 2008 Vehicle Anti-Idling Policy

ORIGIN

February 25, 2019 Transportation Standing Committee meeting, Item No. 12.1.1

LEGISLATIVE AUTHORITY

Administrative Order 1, Respecting the Procedures of the Council, Schedule 7, Transportation Standing Committee Terms of Reference, section 8 (a):

"The Transportation Standing Committee shall promote and encourage the development of integrated programs, policies and initiatives in the municipality that support the Municipality's transportation goals and outcomes."

RECOMMENDATION

The Transportation Standing Committee recommends that Regional Council:

1. Direct staff to update the 2008 HRM Vehicle Anti-Idling Policy, and consolidate related policies into that update, based on the findings of the staff report dated October 31, 2018 and ongoing monitoring of fleet vehicle idling activity;
2. Direct staff to evaluate the impact of the new consolidated Policy on fleet vehicle and equipment idling, fuel consumption and greenhouse gas emissions after two years, and return to the Transportation Standing Committee with a report documenting progress; and
3. Direct staff to develop business unit-specific greenhouse gas emission targets to reduce idling and fuel consumption, coupled with employee coaching and feedback on idling behaviour and fuel consumption.

BACKGROUND

A staff report dated October 31, 2018 pertaining to the Vehicle Anti-Idling Policy was before the Transportation Standing Committee for consideration at its February 25, 2019 meeting.

For further information, please refer to the attached staff report dated October 31, 2018.

DISCUSSION

The Transportation Standing Committee reviewed the October 31, 2018 staff report at its meeting held on February 25, 2019 and forwarded the recommendation to Halifax Regional Council as outlined in this report.

FINANCIAL IMPLICATIONS

As outlined in the attached staff report dated October 31, 2018.

RISK CONSIDERATION

As outlined in the attached staff report dated October 31, 2018.

COMMUNITY ENGAGEMENT

The Transportation Standing Committee meetings are open to public attendance, a live webcast is provided of the meeting, and members of the public are invited to address the Committee for up to five minutes at the end of each meeting during the Public Participation portion of the meeting. The agenda, reports, video, and minutes of the Transportation Standing Committee are posted on Halifax.ca.

ENVIRONMENTAL IMPLICATIONS

As outlined in the attached staff report dated October 31, 2018.

ALTERNATIVES

The Transportation Standing Committee did not discuss alternative recommendations.

ATTACHMENTS

1. Staff report dated October 31, 2018.

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

Report Prepared by: Phoebe Rai, Legislative Assistant, 902.490.6517.



P.O. Box 1749
Halifax, Nova Scotia
B3J 3A5 Canada

Item No. 12.1.1
Transportation Standing Committee
February 25, 2019

TO: Chair and Members of the Transportation Standing Committee

SUBMITTED BY: **Original Signed**

Kelly Denty, Director of Planning & Development
Original Signed

Jacques Dubé, Chief Administrative Officer

DATE: October 31, 2018

SUBJECT: **Update on HRM's 2008 Vehicle Anti-Idling Policy**

ORIGIN

- HRM Vehicle Anti-Idling Policy, August 2008
- May 5, 2011 Environment and Sustainability Committee
THAT the Environment and Sustainability Standing Committee direct staff to:
 1. Not proceed with drafting an anti-idling by-law in 2011/2012; and
 2. Develop and continue a public engagement program using the March 2006 Reducing Idling in Halifax Regional Municipality (HRM) Project.
- October 26, 2017 Transportation Standing Committee
THAT the Transportation Standing Committee request a staff recommendation report on the successes of the Anti-Idle By-law* and provide information in regard to the next steps

*Note that above motion is worded as per the approved minutes. It does not, however, accurately reflect the wording of the motion that was actually moved by Councillor Nicoll. The motion as per the approved minutes refers to the successes of the "Anti Idle By-law", which does not exist. A review of the video from the committee meeting indicates that motion actually verbalized by Councillor Nicoll was as follows:

"That the Transportation Standing Committee request a staff recommendation report on the successes of the HRM Vehicle Anti Idle Policy that was written up August 2008 providing information in regard to next steps."

In preparing this report, staff corresponded with Councillor Nicoll to confirm that her intention was for this report to address the successes of HRM's 2008 Anti-Idling Policy.

LEGISLATIVE AUTHORITY

Halifax Regional Municipality Charter, Section 34, (3) The Council shall provide direction on the administration, plans, policies and programs of the Municipality to the Chief Administrative Officer.

Halifax Regional Municipality Charter, Section 35, (1) The Chief Administrative Officer shall ... (d) review the drafts of all proposed by-laws and policies and make recommendations to the Council with respect to them;

Halifax Regional Municipality Charter, Section 59, (3) In addition to matters specified in this Act or another Act of the Legislature, the Council may adopt policies on any matter that the Council considers conducive to the effective management of the Municipality.

Halifax Regional Municipality Charter, Section 188, (1) The 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;

RECOMMENDATION

It is recommended that the Transportation Standing Committee recommend that Regional Council:

1. Direct staff to update the 2008 HRM Vehicle Anti-Idling Policy, and consolidate related policies into that update, based on the findings of this report and ongoing monitoring of fleet vehicle idling activity;
2. Direct staff to evaluate the impact of the new consolidated Policy on fleet vehicle and equipment idling, fuel consumption and greenhouse gas emissions after two years, and return to the Transportation Standing Committee with a report documenting progress; and
3. Direct staff to develop business unit-specific greenhouse gas emission targets to reduce idling and fuel consumption, coupled with employee coaching and feedback on idling behaviour and fuel consumption.

BACKGROUND

Municipal vehicle and equipment idling consumes fuel, emits greenhouse gases and releases other harmful air pollutants that can impact human and environment health. Natural Resources Canada (NRCan) reports that idling for 10 seconds consumes more fuel and emits more GHGs than restarting a car's engine. In fact, after 1-minute the fuel costs of idling start to exceed any potential increase in maintenance costs associated with more frequent restarting. Some idling may be deemed "necessary" as part of maintenance or operational requirements, emergency response, ensuring employee and/or public health and safety (e.g., during extreme weather), or to power auxiliary equipment. However, engine idling in other cases is often unnecessary and avoidable, creating harmful pollution and wasting fuel.

The Municipality addresses fleet vehicle and equipment idling behaviour internally through a framework of corporate policies, programs and plans, including the 2008 Vehicle Anti-Idling Policy (Attachment A). Table 1 below outlines this framework and the scope of each policy, program or plan as it relates to idling.

HRM does not presently have an anti-idling by-law. In April 2011 the ESSC requested that staff draft and present an Anti-Idling By-Law in the 2011-2012 business year¹. The resulting staff report (May 5th, 2011) recommended that, based on media coverage and public feedback, such a by-law would not be in the public interest. As a more practical and cost-effective alternative, the Committee accepted staff's recommendation to continue the Municipality's successful 2006 "Reducing Unnecessary Idling in HRM Project" (i.e., 'Reduced Idling Program'; Attachment B) through a partnership between the Adventure Earth Centre's HEAT team and HRM's former Sustainable Environment Management Office.

In lieu of an anti-idling by-law, HRM's Noise By-law (N-200) broadly addresses engine idling in residential areas, while Nova Scotia's Anti-Idling Act applies to passenger vehicle fleets (including transit buses). Attachment C provides a brief overview of By-law N-200 and other idling legislation and policies in Nova Scotia, including corporate policies (municipal and provincial government), municipal and provincial regulations and federal programs focused on idling.

Internal Policies, Programs and Plans

Table 1 lists HRM's staff-focused tools and approaches to reduce municipal idling and fleet emissions. The tools and approaches reflect HRM's Values ('sustainability') and Administrative Priority Areas ('financial responsibility', 'our people' and 'health & safety'), outlined in the 2017-2021 Strategic Plan. Ultimately these policies, programs and plans reinforce and fulfil Council's *Healthy, Livable Communities* priority area².

Table 1 – Tools Forming HRM's Policy and Planning Framework with respect to Idling

Tool Type	Name of Tool/Approach	Idling-related Highlights of Tool/Approach
Policy	2008 HRM Vehicle Anti-Idling Policy <i>This Policy was an internal response to HRM's 2006 Reduced Idling Program campaign "Ladies and Gentlemen, Stop Your Engines" (Attachment B)</i>	<ul style="list-style-type: none"> • HRM-wide policy to limit all engine idling to 1-minute or less. • Outlines 7 exceptions that apply to safety, operational requirements, extreme weather, maintenance, Transit buses and emergency vehicles. • Use of drive-through services is not permitted and is considered unnecessary idling.
Program	2010 Green Fleet Initiatives: HRM Fleet Fuel Consumption Reduction Program (2011-2013)	<ul style="list-style-type: none"> • Goals were to reduce idling and fleet fuel consumption by 5 to 10% (no evaluation stats were available).
Policy	2011 HRM Fleet Use Policy	<ul style="list-style-type: none"> • Applies to light-duty/passenger vehicles and administrative vehicles only. Provides for the use of AVL devices to monitor all fleet vehicles and their activity.
Policy	2014 HRM Operator's Manual – Motor Vehicle Operators	<ul style="list-style-type: none"> • Applies to all drivers of HRM vehicles. The 2008 Anti-Idling Policy is appended to the Manual.

¹ <http://legacycontent.halifax.ca/boardscom/SCenv/documents/110407.pdf>

² <https://www.halifax.ca/sites/default/files/documents/city-hall/standing-committees/171026tsc12.1.3.pdf>

Policy	2015 Anti-Idling Standard Operating Procedure, 2015M-01 (Attachment D)	<ul style="list-style-type: none"> Applies to all Corporate Fleet vehicles including emergency and heavy-duty/utility units. Intended to reinforce the 2008 anti-idling policy and refers to exceptions listed therein, as well as vehicle/equipment manufacturer's safe operating practices.
Policy	2016 Halifax Transit Policy Manual (Operational Policies, section 3)	<ul style="list-style-type: none"> Applies differently to Transit Operators and Transit employees using municipal fleet vehicles. Transit employees using fleet vehicles follow the same rules and exceptions as HRM's 2008 policy, including the 1-minute idling rule. Transit Operators instead follow a 3-minute idling rule, including layovers and engine warm-up periods, in addition to HRM's 2008 policy exceptions. Notably, if the temperature is above or below a certain range, Transit Operators do not shut the vehicles off to ensure the heating or A/C system continues to operate to maintain passenger safety/comfort.
Priority Plan	2012-2020 Corporate Plan to Reduce Greenhouse Gas (GHG) Emissions	<ul style="list-style-type: none"> Highlights the importance of reducing fleet vehicle fuel consumption and engine idling to achieve HRM's GHG emissions reduction target of 30% below 2008 levels by 2020. Calls for annual data collection & monitoring of fleet vehicle & equipment fuel usage, GHG emissions and idling (via AVL devices)
Priority Plan	2016 Community Energy Plan Update Report ³ : 2-year Strategy	<ul style="list-style-type: none"> Outlines actions to implement driver training for HRM's fleet drivers and ongoing use of the anti-idling policy.

Monitoring of Vehicle Fuel Consumption & Idling Activity

In 2015 HRM began installing AVL devices in its corporate fleet vehicles under contract with Northern Business Intelligence (NBI). By 2017 all corporate fleet vehicles (excluding Halifax Regional Police and Halifax Transit) were equipped with AVL devices capable of tracking a vehicle's geographic position, engine operation and status, driver behaviour (e.g., harsh acceleration, speeding), fuel consumption and idling activity in real-time. The AVL devices collect continuous data that is logged in an online database. Custom reports can then be generated and sent directly to fleet supervisors, line managers and team leaders to highlight compliance statistics – including violations of custom rules (e.g., using a drive-through service).

Halifax Transit buses are equipped with a different type of AVL system that transmits real-time information on the geographic position and total trip kilometres travelled for each bus. The system does not currently monitor engine idling or fuel consumption; Halifax Transit's Technology Roadmap⁴ outlines means to address this. Like Transit buses, Halifax Regional Police vehicles are equipped with a custom AVL system. No data from HRP or Halifax Transit's AVL systems are presented in the tables and charts below.

Halifax Idle-Free Climate Action

On March 23rd, 2017, GoGreen Communications and The Children's Clean Air Network presented a proposal for *Halifax Idle-Free Climate Action* to the Transportation Standing Committee (TSC). The TSC requested a staff report (also delivered to the ESSC) to investigate, among other things, the costs for HRM to implement the proposed program, and the municipality's current use of technology to manage and reduce idling and emissions in its fleet vehicles. The subsequent information report⁵ (October 26th, 2017) advised that the program costs may be partly offset by cost-savings associated with the implementation of an anti-idling initiative. However, the extent of cost savings (if any) to HRM "are difficult to quantify, particularly because the municipality currently is pursuing a range of emission-reduction-related activities".

DISCUSSION

Prior to this staff report neither the effectiveness of HRM's 2008 Vehicle Anti-Idling Policy, nor the *policies* listed in Table 1 had been formally evaluated with respect to its impacts on idling behaviour. In 2015,

³ See CEP 2016 Update: 2-year strategy towards a new 10-year CEP https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/HRM%20Community%20Energy%20Plan%20-%202016%20Update%20Report_0.pdf

⁴ The Roadmap calls for investment in bus sensors that could provide enhanced tracking of, and reporting on, bus operation metrics (including engine idling).

⁵ See footnote 2 for link to the *Idle Free Initiative* staff report.

Standard Operating Procedure 2015M-01 was introduced to reinforce the 2008 Policy, which suggests that unnecessary idling activity was still high enough after 7 years to warrant a stand-alone policy – despite the Policy’s ‘1-minute rule’, its inclusion in fleet vehicle operator manuals, and driver training to help curb idling.

As part of routine operations, employees regularly monitor all fuel consumption, fuel costs and GHG emissions associated with fleet vehicles and equipment, including Halifax Regional Police’s (HRP) vehicle fleet and Halifax Transit’s bus, Access-A-Bus and ferry fleets (based on fuel pump transactions). That monitoring is critical not only for transparency and sound financial management, but also to evaluate progress toward HRM’s energy conservation and GHG emissions reduction targets set out in the Priority Plans listed in Table 1. Until recently it was not possible to distinguish fleet fuel consumption due to driving from that consumed during unnecessary idling. Attachment D discusses Table 1 and HRM’s fleet fuel consumption, idling and GHG emissions monitoring in more detail.

Most of HRM’s existing policies, programs and plans related to idling simply state that idling should be limited and assume voluntary compliance by staff. Except for the 2012-2020 Corporate Plan to Reduce GHG Emissions, HRM’s approaches exclude any targets, metrics or indicators to help staff monitor and evaluate their effectiveness over time. HRM’s policies and programs also lack incentives for compliance, either through obvious enforcement provisions or recognition of good behaviour; however, the 2011 HRM Fleet Use Policy and Transit’s 2016 Policy Manual do outline compliance expectations. Whatever the case, monitoring, enforcement and/or disciplinary action under any of HRM’s existing policies is complex. This report therefore recommends updating the 2008 Policy based upon the employee survey and AVL data presented below. It could also be advantageous to consolidate the 2008 Policy with other idling-focused tools in Table 1 to simplify and better articulate HRM’s approach to managing idling. These actions will ensure that the updated Policy’s scope and objectives remain clear, its exceptions remain realistic and necessary, and monitoring and evaluation of the Policy are aligned with HRM’s Key Performance Indicators and Council’s current and future Priority Plans (e.g., the Corporate Plan to Reduce GHG Emissions).

What is the Idling Situation at HRM?

Table 2 below outlines a raw summary of HRM’s fleet vehicle usage and idling statistics for the 2017 calendar year; **the data have not been adjusted to reflect exceptions to the 2008 Policy or use of add-on equipment requiring auxiliary power/power take-off (PTO) needs.** There is no monitoring available for engine idling by non-vehicular equipment (e.g., lawn mowers). The analysis presented below reflects the approximately 70% of corporate fleet vehicles equipped with AVL devices as of late fall 2017. Winter operations vehicles were equipped with AVL devices first and are better represented in the data than vehicles in other business units, which started coming online in fall 2017.

Monitoring results for 2017 put HRM’s idling at 25.4% of annual operational time (Table 2) and an average of more than 13 hours per vehicle per year. Not accounting for ‘necessary’ idling to support the use of auxiliary equipment (e.g., hoists, signboards, etc.), HRM’s “Top 20 Idlers” consume at least 27% of all the fuel burned by corporate fleet vehicles while idling. That represents more than 5% of all fleet-based GHG emissions for the 2015-16 fiscal year. Focusing on idling times over 5 minutes (in violation of the 2008 Policy’s limit of 1-minute) more than 500 exceptions occur per day, excluding vehicles being stopped in traffic. Some sources suggest that 1-hour of idling puts the equivalent wear on an engine as driving 50 km, an effect called “ghost mileage”, which can reduce engine life and increase maintenance needs.

Table 2 – Annual Summary of Unadjusted Idling Metrics for HRM Fleet vehicles, based on AVL data (Based on a total of 298 vehicles equipped with AVL devices in 2017). No Halifax Transit buses or fleet vehicles are included.

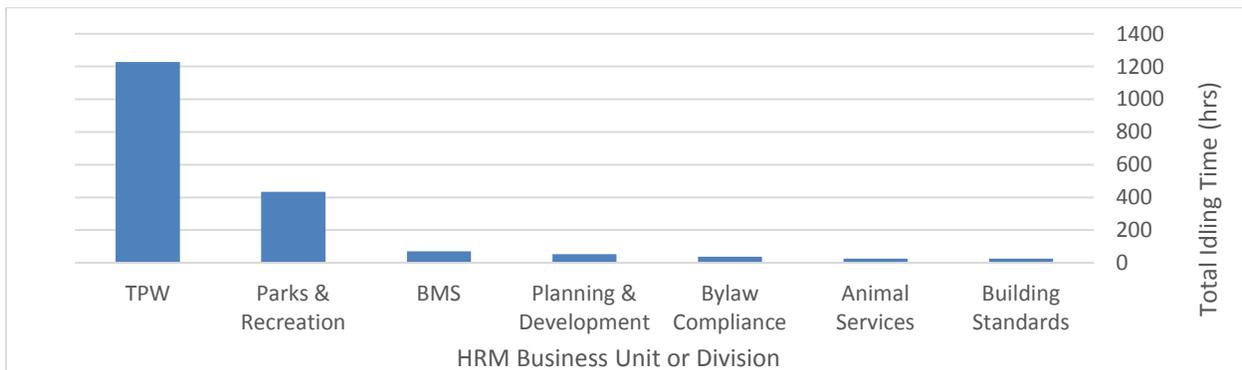
Annual Benchmark Data (2017 calendar year unless stated otherwise)	
Municipal vehicles equipped with AVL devices as of May 2018 (Listed by BU/division)	Corporate fleet – 358 of 487 vehicles HRFE – 92 of 281 vehicles (light-duty only)
Average kms per vehicle per month	1,055
Total distance driven, all vehicles (kms)	3,529,966
Total engine hours, all vehicles (hrs)	245,326
Idling Statistics (2017 calendar year)	
Total idling hours, all vehicles (hrs)	44,293

Average % operational time spent idling	25.4% (22% for HRFE vehicles)
Minimum cost of idling ⁶ , all vehicles (fuel @ \$1.10/L)	\$155,027
Cost of idling, "Top 20 Idlers" (fuel @ \$1.10/L)	\$41,239
Average idling hours per vehicle (hrs)	13.25
Total # instances of idling >5 minutes	182,480
Average # instances of idling >5 minutes per day	500
Average # instances per vehicle per day	1.7
Annual GHG emissions while idling, "Top 20 Idlers"	344.75 tonnes eCO ₂ (estimated)

The time vehicles spend idling tends to vary with the seasons, with more idling occurring during the winter months, likely due to vehicle heating. Halifax Regional Fire and Emergency (HRFE) vehicles idle on average 22% of the time throughout the year, slightly less than corporate fleet vehicles; all HRFE's heavy-duty vehicles are equipped with AVL devices that filter out idling related to auxiliary power/PTO usage. There are no baseline data prior to 2015/16 against which to compare current AVL-based fleet idling statistics, necessary or not, so it is difficult to know whether the situation is improving over time. The AVL data also reveal nothing about employee experience with the 2008 Policy, or sentiment around its effectiveness.

The fleet idling metrics presented here have not been adjusted for vehicles that must idle to provide auxiliary power/PTO to run operational equipment such as laptops, telecom systems, beacon lights, signboards, hoists or aerial lifts. Those adjustments are particularly relevant for the diverse mix of vehicles used by TPW, ranging from 4-door sedans to heavy-duty utility vehicles and snowplows. As an example, the idling times for HRM's top 20 idlers in Figure 1 (below) do not account for weather conditions during vehicle operation (e.g., extreme temperatures), maintenance or operational idling requirements, or idling to protect human health and/or public safety. Most of HRM's fleet AVL devices are not calibrated to track idling in such circumstances – all of which are excepted under the 2008 Policy. HRM's fleet AVL devices could be equipped to monitor auxiliary power/PTO usage with the installation of an AVL AUX-IOX device "harness", estimated to cost at least \$75 per vehicle (approximately \$37,000 for the corporate fleet, excluding taxes and labour costs). Viewed simply by idling time, most of HRM's the top 20 idlers shown in Figure 1 are ½ to ¾ ton fleet trucks (e.g., Ford F250s) assigned to Transportation & Public Works (TPW) and Parks & Recreation. However, it is difficult to reduce the idling times in Figure 1 without knowing the circumstances.

Figure 1 - Annual Idling Duration for the Top 20 Idlers in HRM's fleet, grouped by BU or Division to which they are assigned (2017 calendar year). TPW is Transportation & Public Works; BMS is Building Maintenance Services, within the Corporate & Customer Services BU. HRFE fleet vehicles were excluded from this analysis. No Halifax Transit buses or fleet vehicles were included in this analysis.



⁶ Based on average idling fuel consumption for a light-duty/passenger vehicle. The cost of idling estimates derived from AVL devices are based on a standard cost of fuel, and the average engine capacity and fuel consumption for vehicles in each class (e.g., light-duty, heavy-duty). The cost is set to \$1.10 per litre, representing an average between the cost of diesel and motor gasoline.

HRM's corporate fleet AVL system allows monitoring of various vehicle metrics based on geographic position, allowing fleet managers to view statistics such as idling time in customized zones, e.g., HRM office parking areas. Currently there are 185 different 'zones' defined throughout the municipality, falling into 17 different categories, including "Customer zone" (anywhere HRM serves the public), "HRM Facilities", "HRM Offices", "Parks", "Home" (for assigned fleet vehicles), and "Shops" (e.g., Tim Hortons).

Targeting the locations where idling is more common, and understanding what circumstances lead drivers to idle in those locations, can help to identify opportunities to change behaviours and reduce HRM's idling and fuel consumption. One method is to look at the type of vehicle doing the idling, determine its assigned BU or division, and identify where the idling takes place. The AVL data show that more than half of the fleet vehicles idling in HRM office zones (e.g., outside facilities or in parking areas) are utility tractors and street sweepers, i.e., slow-moving vehicles likely maintaining roadways, sidewalks and parking lots. Table 3 outlines the zones in which the longest idling times are observed for vehicles in each BU or division.

Table 3 - Total idling time (exceeding 5 minutes) per AVL 'zone' for each monitored BU/division. HRFE fleet vehicles were excluded from this analysis. No Halifax Transit buses or fleet vehicles were included. This total includes all vehicles, not just the top 20 idlers shown in Figure 1.

HRM BU or Division	Idling time in listed zone [% of BU/Div's total idling]	Zone (multiple if zones overlap in a given area)
Transportation & Public Works (all divisions)	14,979 hrs [44%]	Customer zone (incl. roadwork, sidewalk and street snow removal)
Planning & Development (all divisions)	8,520 hrs [88%]	HRM Facilities/HRM Offices
Animal Services (within P&D)	8518 hrs [93%]	HRM Facilities/HRM Offices
Parks & Recreation (all divisions)	7,940 hrs [77%]	Parks, HRM Facilities/HRM Offices
Building Maintenance Services (within C&CS)	873 hrs [56%]	HRM Facilities/HRM Offices
Bylaw Compliance (within P&D)	548 hrs [71%]	Customer zone
Building Standards (within P&D)	241 hrs [57%]	Customer zone

Many staff in the BUs and divisions listed in Table 3 must use computers, telecoms/wi-fi equipment, traffic-directing lights and other support devices that require auxiliary power in the performance of their duties, which may be almost entirely vehicle-based/-dependent. For those employees, a fleet vehicle is effectively an office. In such cases vehicle idling falls within the 2008 Policy exceptions and therefore may not be reducible based on operational requirements. Additionally, vehicles such as street sweepers move very slowly over time and may incorrectly appear to be idling given the AVL devices' lack of very fine-scale geographic accuracy; such vehicles fall entirely within TPW's fleet. Finally, idling during vehicle maintenance is excepted under the 2008 Policy, and may not be reducible (maintenance would typically fall into the 'HRM Facility' zone).

Even after accounting for excepted idling in Table 3, there may be an opportunity to reduce unnecessary fuel consumption and idling in HRM Facility and HRM Office zones. To begin mitigating 'on-site' idling, this report recommends collaboratively developing BU-specific targets to reduce idling and fuel consumption, coupled with periodic BU-based employee coaching and feedback on idling behaviour and fuel consumption. The key consideration in looking at mitigation options will be the comparison of cost savings for fuel not consumed versus the incremental cost of any alternative solutions.

Changes in total fleet fuel consumption over time cannot reveal any shifts in vehicle and/or equipment idling behaviour. Determining this would require monitoring of annual fuel consumption, operational time and distance travelled for a subset of vehicles and equipment, assuming they are all operating under the same conditions, completing the same work in the same seasons, year over year. This is not possible, particularly for fleet motor pool vehicles that may be used by any authorized staff on an as-needed basis. Therefore, the observed decrease in GHGs associated with HRM's corporate fleet from 2008 to 2015-16 of over 1,200

tonnes of CO₂e cannot be attributed to a particular factor. Moving forward, the fleet AVL systems will permit staff to track changes in fuel economy, idling time and GHG intensity of each fleet vehicle.⁷

How do HRM employees perceive idling?

As per HRM's core value of evidence-based decision-making, it is important to evaluate the effectiveness of the existing idling policies, and any recommendations for next steps, on the users' impressions of and experiences with those policies. To date anecdotal information has been the only means to assess employees' experiences with the policies.

Employee Survey

To inform the recommendations herein and account for the limitations of the AVL data regarding the 2008 Policy exceptions, a voluntary internal survey was conducted over a 4-week period to collect employee feedback. The survey was circulated to all BU coordinators, all managers/supervisors known to have staff requiring access to a fleet vehicle at some time, all drivers of assigned vehicles, all fleet supervisors (including Transit and HRP), all HRFE division captains and any active users of the fleet motor pool. This survey method relies on "homogeneous purposeful sampling"⁸; in this case the 'homogeneous' population being sampled was fleet vehicle users at HRM. More than 100 respondents completed the survey, which represents about 3% of HRM's workforce. Survey limitations and caveats are discussed in the closing section. The survey assessed three themes related to the 2008 policy:

- i) Awareness and observance of HRM's 2008 Vehicle Anti Idling Policy;
- ii) Feelings regarding the Policy's scope and effectiveness;
- ii) Perceived opportunities to reduce idling in fleet vehicles; and,
- iii) Interest in renewing the Policy in support of various goals, including GHG emission reductions

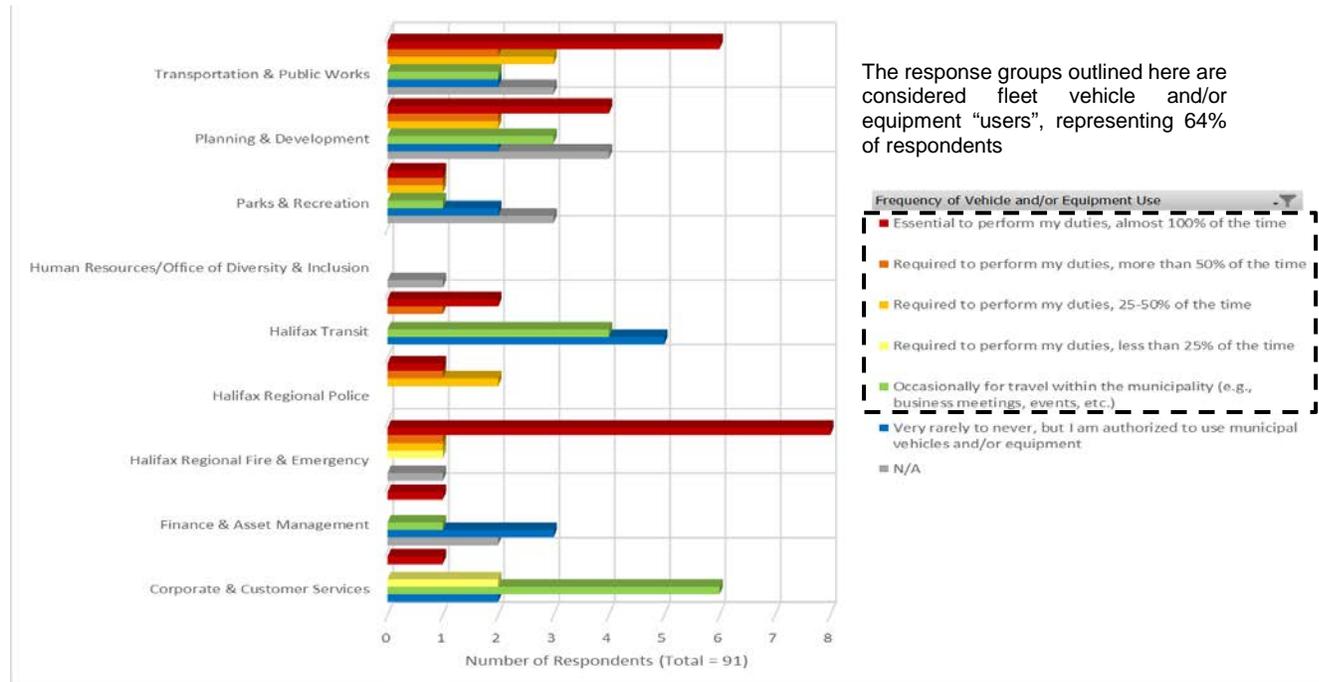
The survey was designed so responses could be filtered for key factors influencing data quality, including whether and how often a respondent uses municipal vehicles and/or equipment; whether the respondent is aware of the Policy; whether and how often the Policy's exceptions apply to the respondent; and, which BU the respondent represents. This type of filtering is called "stratification" and can enhance sample analysis.

Figure 2 shows the survey response rate by BU and frequency of fleet vehicle and/or equipment use (the main filter applied). Staff from Transportation & Public Works and Planning & Development (including the Animal Services, Building Standards and Bylaw Compliance divisions detailed in the preceding AVL data) showed the highest response rate overall, with Halifax Regional Fire & Emergency showing the highest rate of response by staff for whom use of a vehicle and/or equipment is essential to perform their duties.

⁷ There is currently no way to accurately monitor changes in fuel consumption for HRM *equipment* (e.g., lawn mowers) other than looking at fuel pump transactions. That approach does not control for the amount of work being done with the equipment, etc., and detailed tracking of such metrics would be impractical for staff and contractors to gather and record in the field.

⁸ "Purposeful sampling is commonly used in qualitative research to identify and select information-rich cases for the most effective use of limited resources (Patton, 2002)." in Palinkas et al, 2015 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4012002/>

Figure 2 - Total number of survey responses by HRM business unit and frequency of fleet vehicle and/or equipment use. "N/A" represents respondents who do not use vehicles or equipment at all. "Users" are defined in the legend.



Without applying any filters to the responses, the survey results (Attachment E) suggest that there is good awareness of the 2008 Policy and it is generally considered beneficial by the users surveyed. Most respondents agreed that while the 2008 Policy is good, there is a lack of enforcement and a need for better communication to employees. More than half of respondents also agreed that the Policy “should focus more on environmental benefits” and “focus more on reducing operational costs”. Respondents were not as certain when asked (in two different ways) if the Policy has led to decreased idling. More than 80% of respondents supported the Policy being retained, and fewer than 20% of respondents said the Policy is too strict or has too many exceptions. Together, these findings are consistent with the above recommendation to update the existing anti-idling policy to include BU-specific idling reduction targets with practical measures and employee feedback informed by monitoring of fleet AVL systems.

Vehicle and/or Equipment Users vs. Non-users

By design, the employee survey provides important feedback from the subset of the employees most affected by the 2008 Policy. Figure 2 shows how the 64% of fleet vehicle and/or equipment “users” were defined among survey respondents, including their respective BU. Respondents whose frequency of vehicle/equipment use was “very rarely to never” or “n/a” were labelled “non-users” for analytical purposes and their responses were isolated. Generally, the responses by users and non-users were similar. Both users and non-users showed the same overall levels of awareness of and support for the 2008 Policy.

More than half of users felt that the 2008 Policy is well-aligned with operational/duty requirements. Survey respondents who disagreed with that statement were almost all vehicle users from Transportation & Public Works (e.g., snow clearing teams, traffic management) and Planning & Development (e.g., building officials, compliance officers). This finding supports the recommendation to set BU-specific idling reduction targets.

Looking at the 2008 Policy’s exceptions, more than half of the of users surveyed said that one or more of the exceptions “describe the circumstances” in which they typically use municipal vehicles and/or equipment; the remainder said the exceptions did not apply to them or were not sure. More than half of users affected by the exceptions said they apply between 40% and 100% of the time during their operation of a municipal vehicle; only respondents from Halifax Regional Fire & Emergency said the Policy’s

exceptions apply 100% of the time⁹. Results show that most users surveyed are happy with the Policy's current exceptions. Slightly more than half of users surveyed thought the Policy should include "more incentives for good driving".

A key question regarding the Policy's effectiveness is how often vehicle and/or equipment users try to limit idling *beyond the 2008 Policy's exceptions*, i.e., how frequently do they limit truly unnecessary idling. Most users said they try to limit unnecessary idling "always" or "almost always (more than 80% of the time)", but a small group of users said they tried to limit idling "less than 40% of the time" to "never". There is no way to correlate these responses with the AVL-based idling data. Such behaviour could be the focal point for employee education and internal communication efforts to reduce HRM's unnecessary idling.

Question 7 of the employee survey asked staff to choose from measures that could potentially limit engine idling. Most vehicle users affected by the policy's exceptions responded that "my duties prevent any further reduction of idling". That response may shed important light on the AVL idling data shown above, particularly with respect to employees who perform start-and-stop tasks and those performing maintenance on vehicles/equipment. Both users and non-users felt that, among other measures, "additional training on low-emissions driving techniques" would help them limit idling. Those responses are consistent with the recommendations herein to review and update the 2008 Policy, and to develop BU-specific idling reduction targets and training opportunities.

Next Steps

The employee survey included a series of questions that asked respondents to agree or disagree with various objectives and options for a renewed anti-idling policy at HRM. The responses to those questions could help to shape the direction of a review and update of the 2008 Policy. The responses could also help HRM pursue strategies to achieve its current and future corporate GHG emissions reduction targets, in accordance with the recommendations outlined in this report.

Question 11 of the employee survey asked respondents to rank the importance of various objectives for HRM's Vehicle Anti-Idling Policy from "not at all necessary" to "critical". Table 4 summarizes the objectives for which more than 50% of respondents answered "critical" or "very important". The key themes that emerged here align with Council's "Healthy, Livable Communities" and "Governance & Engagement" Priority Areas, i.e., energy and fuel conservation, GHG emissions reduction, pollution reduction, cost reduction, and municipal leadership.

Table 4 - Suggested anti-idling policy objectives ranked "critical" or "very important" by more than 50% of all survey respondents (n=92 respondents)

Objective for Anti-Idling Policy	Total % of respondents
To reduce air pollution from vehicle and equipment exhaust	64%
To promote energy conservation	66%
To meet HRM's 2020 goal to reduce corporate GHG emissions by 30% below 2008 levels	64%
To promote healthy, livable communities	60%
To reduce fuel usage	63%
To reduce operational costs	59%
To effectively deliver municipal services (included given Council's priorities)	49%
To show municipal leadership on tackling climate change	62%
To promote a consistent approach with all employees to reducing idling	56%
To show leadership on climate issues for other NS municipalities	58%

⁹ These responses provide helpful context to interpret the AVL-based idling data, particularly noting that respondents from Transportation and Public Works, which shows the highest total idling time in Table 3, had no responses in the "always" category but more in the 'occasionally' to 'most of the time' categories.

The final questions of the survey asked about potential/hypothetical corporate actions and strategies to reduce vehicle and/or equipment idling¹⁰. The actions and strategies fell into five broad categories that help to inform the recommendations herein: Options for Driver or Operator Feedback; Additional Training Options; Better Enforcement Options; Options to Use Different Vehicles and/or Equipment; and, Options for Transportation Alternatives. Survey respondents favoured four corporate actions and strategies:

- “Set realistic targets to reduce my idling and/or fuel consumption over time (66% agreement)
- “Provide periodic, anonymous idling stats for the whole municipal fleet, e.g., via the Employee Hub emails (64% agreement)
- “List relevant examples of how to reduce idling in an attachment to the Policy, tailored to each BU's day-to-day operations” (74% agreement)
- “Provide better access to more fuel-efficient vehicles and equipment” (70% agreement)

Appendix F includes figures showing a breakdown of all responses by respondents' frequency of municipal vehicle and/or equipment. The figures show the levels of agreement for each user and non-user group as a proxy for how much exposure they could have to a particular action or strategy if adopted.

Limitations and Caveats

The limitations of the employee anti-idling survey and AVL data should be considered when evaluating the results. Some of the most important limitations are listed in Attachment G. The survey results have not been assessed for statistical significance. Instead, descriptive statistics are provided based upon the survey data. Responses with more than 50% agreement are assumed to be *important indicators* but are not “statistically significant”. The survey's design and distribution (in support of a “homogeneous purposive sample”), and the number of responses (relative to HRM's workforce) preclude and limit the analytical power of most inferential statistical tests that could determine statistical significance. Similarly, it is not possible to confirm if the survey results are representative of broader trends among all HRM employees, but this could be done with a more extensive, completely randomized internal survey effort that would require more resources.

Planning for Action

Recommended next steps include exploring options to reduce idling as part of HRM's broader 2-year Community Energy and Climate Action Plan (CECAP). The Municipality's CECAP represents a crucial update of two existing Priority Plans: the Community Energy Plan (2007) and the Corporate Plan to Reduce GHG Emissions 2012-2020 (2011). Like its predecessors, the CECAP will, among other things, directly help staff achieve and build upon Regional Plan policies E-25 to E-34 to reflect HRM's long-term targets for improving energy conservation and efficiency, reducing GHG emissions related to fuel consumption and unnecessary idling (both corporate and community-wide). Idling by HRM's fleet vehicles currently accounts for about 25% of vehicle operational time. Experts in the field speculate that this could be reduced to 10% or less for HRM's passenger/light-duty vehicles. The CECAP will also address community-wide transportation-related energy consumption and GHG emissions, and staff expect to explore options for reducing idling at the community level through stakeholder engagement.

¹⁰ These are hypothetical options only and would require close consultation with Corporate Fleet staff before being implemented.

FINANCIAL IMPLICATIONS

There are no financial implications of this report. The staff resources required to review and update the 2008 Vehicle Anti-Idling Policy – as well as funds required for the development of the Community Energy and Climate Action Plan – are included in the approved 2018/19 Energy & Environment business plan and budget.

RISK CONSIDERATION

There are no risks associated with the recommendations in this report.

COMMUNITY ENGAGEMENT

There has been no external community engagement in the development of this report.

ENVIRONMENTAL IMPLICATIONS

The main environmental implication for the recommendations herein is a reduction in HRM's corporate greenhouse gas emissions over time, both in support of the Council-approved 2020 target to reduce GHG emissions from municipal building, fleet and outdoor lighting by 30% below 2008 levels, and in support of forthcoming GHG reduction targets between 2020 and 2050.

ALTERNATIVES

The Transportation Standing Committee may choose not to proceed with the staff recommendations. Staff do not recommend this as these actions will help to address fleet vehicle and equipment idling in a comprehensive, evidence-based manner that is appropriate for HRM.

ATTACHMENTS

Attachment A – HRM's 2008 Vehicle Anti-Idling Policy
Attachment B – Reducing Idling Program in HRM Final Report March 2006
Attachment C – Partial Jurisdictional Scan of Idling Regulations in HRM and Nova Scotia
Attachment D – Discussion of HRM's Policies, Programs & Plans, incl. Fleet Fuel & Emissions Monitoring
Attachment E – Raw Results of 2018 Employee Survey on HRM's Anti-Idling Policy
Attachment F – Figures Illustrating Detailed Responses to Questions 13 through 17 of the Employee Survey
Attachment G – Discussion of Limitations and Caveats on Employee Survey and AVL Data

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

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**Halifax Regional Municipality
Vehicle Anti Idling Policy
August 2008**

Policy Intent

HRM is committed to becoming a healthy, sustainable and vibrant community. This includes an integrated systems approach to clean air, land, water and energy through a sustainable approach to the services and programs we deliver.

Vehicle emissions produce pollutants that contribute to climate change, smog and acid rain, some of the biggest environmental problems facing our planet today.

Reducing unnecessary idling has a positive effect on our air, land and water.

Policy Statement

The Halifax Regional Municipality has established a Vehicle Anti Idling Policy, which places limitations on engine idling. The policy applies to all vehicles used by HRM employees in the performance of their duties.

Definitions

Idling - means the engine is running while the vehicle is stationary or the piece of equipment is not performing work.

Vehicle - means any on road, or off road, self propelled vehicle that is required to be registered and have a licence plate issued by the Department of Motor vehicles

Equipment - means any self propelled/person operated equipment used in support of Municipal operations and services. (lawn mowers, bush cutters, boat engines, etc.)

Purpose

The purpose of the policy is to reduce the effect of HRM operations on our physical environment by:

- Reducing air pollution from vehicle and equipment exhaust
- Promoting energy conservation
- Reducing noise pollution
- Reducing wear and tear on HRM vehicles and equipment
- Reduce operational costs

Idling limitations

To ensure we approach vehicle idling in a consistent manner, all employees operating Municipal Vehicles and Equipment must adhere to the following idling limitations:

- Vehicles shall never be left idling when unattended
- Engine warm up periods will not exceed one (1) minute (provided air pressure for air brake systems are fully charged and all safety provisions are in place)
- Vehicles shall be shut down whenever idling periods are expected to exceed one (1) minute

* note HRM vehicles are not permitted to access “drive through services” as this too is unnecessary idling

Exceptions

As with all policies there will be some scenarios which are not conducive to the implementation of the limitations described above. Therefore, exceptions to this policy have been identified and only exists under the following circumstances:

- For vehicle maintenance and diagnosis purposes (to be kept to a minimum)
- Under extreme weather conditions or any other time when the health and safety of the employee or others may be jeopardized. To enable proper snow/ice clearing from vehicles.
- If the unit is not expected to be able to restart due to a mechanical problem. In this case, the vehicle is to be sent to Fleet Services for repair.
- Vehicles that need to be running to support operational requirements or while on an emergency scene
- Transit Vehicles in revenue service while carrying passengers.
- Engine is immediately required to power auxiliary equipment. (Hoist, lift platforms, hydraulic pumps, water pumps, etc.)
- This policy does not apply to typical stop and go traffic or when the unit is used for traffic control and is required to be running.

Original Signed

Dan English CAO

August 18, 2008

Date

Ladies and Gentlemen: **Stop Your Engines**

Reducing Idling in
Halifax Regional Municipality

Final Report

March, 2006



Mayor Peter Kelly, Councillor David Hendsbee and Project Manager Stephen King receive help in promoting idling reduction at Bell Park Academic Centre in Lake Echo.



Halifax Regional Municipality's (HRM) Reduced-Idling Campaign was made possible through generous funding from Natural Resources Canada and the leadership of Stephen King, Manager-Senior Advisor, Strategic & Sustainable Resource Management Environmental Management Services of HRM. Lura Consulting was retained to manage and implement the project. If you have any questions regarding the campaign or this report, please contact:

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1.0 Introduction and Context

1.1 Campaign Backdrop and Objectives

Reducing vehicle idling has the potential to improve local air quality as well as lower greenhouse gas emissions, and it is a behaviour that is relatively simple to change – all you have to do is turn your engine off. Projects and studies on reducing vehicle idling have been implemented across Canada, providing evidence that it is possible to see results when using Community-based Social Marketing strategies. This project set out to implement similar strategies to reduce vehicle idling in Halifax Regional Municipality (HRM).

Halifax Regional Municipality (HRM) launched their campaign “Ladies and Gentlemen: Stop Your Engines” in April 2005 to increase awareness about the issues related to unnecessary idling and to assist drivers to change their vehicle idling habits.

HRM’s campaign had the following primary objectives:

1. Increase the awareness of residents of the problems associated with unnecessary vehicle idling; and
2. Reduce unnecessary vehicle idling throughout HRM.

In addition, the campaign was specifically designed to help achieve a number of environmental and community benefits:

- Increased community awareness of concrete actions that can be taken by individuals to reduce greenhouse gas emissions;
- Reduced CO₂ emissions from idling vehicles in HRM;
- Reduced fuel use, costs and vehicle wear and tear; and
- Improved local air quality.

Key Campaign Features

Leadership Campaign. HRM distributed Reduced-Idling Toolkits to more than 5000 employees and volunteer firemen, encouraging them to reduce idling with their personal vehicles and vehicles they use at work.

Evaluation. The Reduced-Idling Campaign included a strong evaluation component, with surveys and studies to measure the success of major campaign initiatives.

Public Awareness. Efforts to inform people about vehicle idling included a mix of social marketing prompts, interventions, commitment strategies, signs, school events, web pages and the launch of a program to include businesses.

Personal Interventions at Community Locations. In order to help change behaviours associated with unnecessary idling, HRM held specific intervention events at places where significant idling is occurring, at schools, transit stations and community hot-spots, among others.

1.2 A Vibrant, Healthy and Sustainable Community

Halifax Regional Municipality has set a goal of being a “healthy, vibrant and sustainable community.” In order to achieve this, HRM has implemented a number of initiatives and projects such as:

- A solid waste management system that is an example to the world;
- A by-law which restricts the use of pesticides within the municipality;
- A new wastewater treatment project that includes new sewer collection systems and new treatment facilities;
- A number of climate change initiatives, including participation in Climate Smart.

The reduced idling project is another element of HRM's commitment to overall environmental sustainability.

1.3 Funders and Partners

The Reduced Idling Project was funded by Halifax Regional Municipality and Natural Resources Canada with a contribution from the Department of Energy of the Province of Nova Scotia. Additional funding was provided by the Climate Change Centre. Halifax Regional Municipality also provided significant in-kind support through staff time as well as promotion and education through a series of stories in its environmental publication Naturally Green which is circulated to every one of the 135,000 households within the municipality.

Partners included:

- The Eco-Efficiency Centre; and
- The Canadian Petroleum Products Institute.

1.4 Community-based Social Marketing

While the campaign strove to increase the awareness of residents regarding the impact of unnecessary idling behavior on air quality and our climate, its primary focus was changing idling behaviour by directly talking to those people who make a difference: drivers of vehicles in the municipality.

Community-based Social Marketing was employed in order to effect a change in driver behaviours.

- In certain areas, Idle-Free Zones were established and signs were erected to ask drivers to turn their engines off. These were on private property such as schools, as the municipality does not allow signage in the traffic right-away unless it is for an enforceable infraction such as parking violations.
- Prompts for vehicles were developed. These included windshield stickers and key chains with an idle-free message, providing the driver with a reminder of the commitment not to run the engine needlessly.
- Commitment strategies were used, in every face-to-face contact made. The windshield sticker constituted a public commitment that the driver would not idle the engine. In addition, the PEER program, an innovative program targeting businesses, made a corporate commitment a condition of involvement in the program.

CBSM in action: a personal contact intervention



CBSM methodologies were applied in select schools, transit locations, private sector and municipal hotspots initiatives, and were used extensively in the workplace initiative.

1.5 Report Overview

This report presents results and highlights of the overall evaluation of the Campaign, as well as highlights and results from the six major campaign initiatives. It is organized into the following sections:

Section 2.0, Campaign Materials, summarizes the development of the campaign materials and includes examples of the types of materials used during the campaign.

Section 3.0, Key Campaign Components, describes and summarizes the results of the six core campaign initiatives that were part of the year-long campaign, including the Public Awareness and Media Campaign, Workplace Initiative, Schools Initiative, GO Transit Initiative, Private Sector Initiative and Municipal Hotspots Initiative.

Section 4.0, Campaign Evaluation, reports on the knowledge, attitudes and behaviours of City residents and key project target audiences concerning vehicle idling both before and after the campaign was implemented, illustrating the effectiveness of the campaign in changing residents' awareness of, and willingness to take action on, the idling issue.

Section 5.0, Sustaining the Campaign, describes further opportunities and partnerships that remain after the project has been completed.

What HRM Residents Said about the Campaign

“It is about time someone tackled this issue.”

“I had to leave my last job because of the air quality in the building because of buses running just outside.”

“Kudos to the Mayor for this project.”

“We have to look at what we are leaving behind for our kids... and right now it is scary.”

“This is a no-brainer”

“Can you stop the buses that park outside of the hospital and run their engines?”

“Thanks for the information, I will pass it on to my friends.”

“Our company stopped idling our vehicles for security reasons. On top of that, we are saving money on fuel, maintenance and operations, all the while protecting air quality.”

“I had no idea...”

“I run a driving school. Can I have materials to give to our students?”

“You have to get the truckers to stop idling all night at gas stations.”

2.0 Campaign Materials

The campaign made use of a wide variety of communications materials, all designed to change people's behaviour regarding idling. These materials included:

- An information brochure explaining the problems associated with unnecessary engine idling and the benefits of reducing idling;
- "Cling-vinyl" windshield decals;
- Key chains;
- Metal signs;
- A series of newsletter articles, delivered to homes;
- A canned PowerPoint presentation;
- A tool-kit used to distribute materials;
- Banners;
- Bumper-stickers; and
- Tire pressure gauges.

Reduced-Idling Campaign Messages

"Ladies and Gentlemen: Stop Your Engines."

"Idle-Free."

"I turn my engine off when I park."

"Idling gets you nowhere!"

"Unnecessary idling pollutes the air, threatens our climate, wastes expensive fuel and reduces engine life."

"If every Canadian motorist avoided idling their vehicle for just 5 minutes each day of the year, we could prevent more than 1 million tonnes of carbon dioxide from entering the atmosphere."

"Idling for more than 10 seconds uses more fuel than stopping and starting your engine."

Key Chain

This keychain serves as a reminder to drivers to turn their engine off when they are parked.



Windshield Decal

This vinyl cling decal was distributed to allow vehicle owners to place it on a windshield, making a public commitment to idling reduction.



Brochure

This informational brochure was developed to educate people about the problems associated with unnecessary vehicle idling.



Metal Street Sign

These signs were made available to organizations that wished to post signage to deter unnecessary idling in their area.

Turn your Engine Off



Idle-Free Zone

Reduced Idling Tool Kit

The Community-based Social Marketing Campaign made use of a Reduced Idling Toolkit, which comprised a informative brochure, keychain and windshield sticker, contained in a striking envelope. The brochure was developed to foster awareness of the issue. The keychain was developed as a reminder to the driver to turn the engine off when parked. The windshield sticker was developed as both a reminder to the driver and a public commitment to reduce unnecessary idling.

**YOUR
REDUCED
IDLING
TOOL KIT**



3.0 Key Campaign Components

3.1 Public Awareness Campaign

Purpose

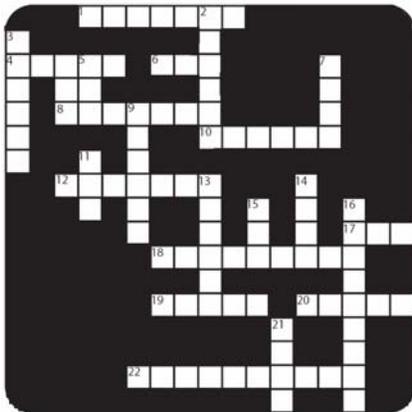
To generate awareness of the problems and negative effects of unnecessary vehicle idling.

Approach

Employing Community-based Social Marketing techniques, the project delivered messages directly into the hands of people, rather than relying on the traditional mass-market approaches such as newspaper, television and radio ads and outdoor advertising such as billboards and transit-stop advertising. Nonetheless, it was important to raise awareness about unnecessary vehicle idling in order to increase the receptivity of residents to the CBSM efforts.

Awareness-building activities included:

- Prominent articles and a cross-word puzzle in HRM's Naturally Green Newsletter;
- A media event at Bell Park Academic Centre in Lake Echo;
- Distribution of Reduced Idling Tool Kits at community events and HRM facilities, as well as at select areas where idling was known to occur;
- A web site on the HRM internet site; and,
- Presentations were made at schools, businesses and to interested parties.



Results

- Local newspaper and television stories, and national exposure;
- Articles in 6 successive newsletters were delivered to every household in the municipality (over 130,000 each time);
- Over 10,000 drivers received toolkits;
- Community groups engaged to assist in disseminating information, including NGO's, Homeowners Associations and Girl Guides.

Across

1. Air measurement
4. Large idler
6. More than this # of seconds is a waste
8. Emissions affect how well we _____
10. Lots of idling here, except in summer
12. Where an idling vehicle gets you
17. What idling pollutes

Down

2. Units of gas
3. Worst in over 100 years
5. Frequent idler
7. Wasted by idling
9. Breathing ailment
11. Most important factor in reducing idling
13. Turn this off
14. Km/litre of idling vehicle
15. Type of engine
16. Stop engine while waiting for one

3.2 Leadership Program

Purpose

To reduce unnecessary idling by HRM employees when using personal and fleet vehicles.

Approach

The Leadership Program sought to establish the HRM corporate operation as an example of how others should reduce the incidence of unnecessary engine idling. It comprised two thrusts: one aimed at employee's use of vehicles in the workplace, and another at their use of vehicles in their personal lives.



- 1. Call to Action** – Mayor Peter Kelly wrote a letter to all employees asking them to reduce engine idling at work and in their personal lives. A strong supporter of the campaign, Mayor Kelly wrote a call to arms, and described the reason why people should not idle. The letter was included in the Reduced-Idling Toolkit, which was distributed to employees and volunteer firefighters throughout the region. A call to action was also included in HRM's internal newsletter, which is made available to all employees and is distributed to all workplaces.
- 2. Fleet Initiative** – Project staff met with the Fleet Manager, who provided support and advice on how to best curb unnecessary idling in the municipality's fleet.
- 3. Transit Initiative** – The Transit Manager pledged full support for the idling campaign and to work with unionized staff to develop a new culture of minimized engine idling.

Results

- Over 5,000 toolkits delivered to HRM employees and volunteer firefighters;
- Story in corporate newsletter delivered to all HRM employees; and
- Initiative underway to develop reduced-idling policy for transit and employees.

3.3 Schools Initiative

Purpose

To provide an example of how schools can reduce the amount of unnecessary idling in their schoolyards.

Approach

Distribution of anti-idling information kits to students at four schools. The cooperation of the schools was established through the School Board, which sees the initiative as a pilot that can be extended to the other schools.

Two of the schools had more intensive internal campaigns.

Officials at Kingswood

Elementary School had idling reduction signs erected in their drop-off areas and parking lot, as did officials at Bell Park Academic Centre. Both schools made presentations to all students in all classes and announced the schoolgrounds as being idle-free zones in school newsletters. In addition, Kingswood Elementary School held an art-work contest for students to promote reduced idling.

Results

- School officials reported a dramatic and immediate decrease in the incidence of idling of both cars and buses.
- Over 1,300 reduced-idling packages were distributed to students at the four schools.
- School officials indicated that air quality had improved on the school grounds and inside the schools as a result of the reduction in vehicle idling.
- Drivers at two of the schools were given toolkits and asked to make a commitment to stop idling.

Schools Program



3.4 Transit Initiative

Purpose

Reduce unnecessary idling by drivers picking up passengers at transit stations.

Approach

Commitment interventions were conducted in the passenger pick up locations at two major bus transit stations and the Dartmouth Ferry Terminal. An evaluation component was also conducted at all three facilities to measure the effectiveness of this component. Because the approach to interventions is similar to that used for the municipal hotspots, the results have been evaluated and aggregated in the Evaluation component of this report.

In addition, the transit operation is currently investigating opportunities to promote reduced-idling strategies amongst bus drivers.



3.5 PEER Program

Purpose

To develop a CBSM strategy for the private sector in order to have businesses encourage their employees to reduce idling while they were driving fleet vehicles and while they were driving their personal vehicles outside of business hours.

Approach

The Eco-Efficiency Centre, which works with Businesses all over Nova Scotia, developed the Partners in Engine Emission Reduction (PEER) Program. Businesses and institutions are offered support for their own reduced-idling program, including toolkits, information, model idling policies and presentations at lunch and learn events.



Results

- ✓ An agreement was struck with the Eco-Efficiency Centre to carry on the PEER program after the reduced-idling project completed, ensuring the sustainability of the reduced-idling effort in Halifax Regional Municipality;
- ✓ Over 60 HRM companies and organizations received personal invitations to join the PEER program; they were identified as companies or organizations that had fleet operations;
- ✓ A three-criteria requirement was established for membership in the PEER program;
 - Development of an internal engine-idling policy;
 - Development of an education program for employees;
 - Encouragement of idling reduction at home as well as at work.
- ✓ A reduced-idling model policy was developed in order to give companies a head-start in developing their own internal campaign;
- ✓ A website was developed to publicize the campaign, provide support and to post the name of companies that have signed on to the program; and
- ✓ A launch of the program was held at the Eco-Efficiency Centre's annual breakfast.

3.6 Hotspots

Purpose

To directly deliver information and Community-based Social Marketing tools to drivers, and to secure commitments to reduce idling.

Approach

The Hotspots Initiative was intended to address unnecessary idling at places in HRM at which it is known that significant idling occurs. Five locations (Dartmouth Transit Station, Dartmouth Ferry Terminal, Mumford/West End Mall Transit Terminal, QEII Hospital, Scotia Square) that were known to have significant traffic volumes at specific times were selected to receive personal contact interventions and evaluation.

At each site, data collection and interventions were conducted at the location where the most idling occurred, usually in areas where passenger drop-off and pick-up are common. A small team of 'project monitors' was hired to collect baseline data, implement the interventions, and conduct the follow-up measurements. These monitors were carefully trained to collect and record data, and to properly identify idling vehicles. Data recording forms and tip sheets were prepared to assist monitors and ensure a consistent approach to data collection both before and after the interventions.

QEII Hospital – Dixon Centre



From February 21st to March 13th, 2006, interventions were conducted by the project monitors at each of the five pilot locations. Pairs of students were stationed at each location for a period of two hours, during afternoon rush hour (3:30 to 5:30 p.m. approximately). Interventions were conducted at each site for three days, from Monday to Friday only, with all attempts made to have the interventions at one site conducted on consecutive days. Each site therefore had approximately 12 -15 person hours of interventions, for a total of 65.5 person hours dedicated to the interventions. Students were well-identified with project T-shirts.

The interventions involved project monitors engaging drivers of personal vehicles or taxis in a conversation about idling, using a pre-arranged script as a starting point. The monitors asked drivers if they had a moment to talk about idling, transmitted some facts about the benefits of reducing vehicle idling, and asked if the driver would be interested in the "Reduced Idling Toolkit".

Scotia Square Office Towers



From February 21st to March 13th, 2006, interventions were conducted by the project monitors at each of the five pilot locations.

Pairs of students were stationed at each location for a period of two hours, during afternoon rush hour (3:30 to 5:30 p.m. approximately). Interventions were conducted at each site for three days, from Monday to Friday only, with all attempts made to have the interventions at one

During the conversation, the monitors asked the drivers if they would be willing to make a commitment to reduce the amount that they idle their vehicle. Personal commitments have been shown to be very effective in achieving desired behaviour changes. The commitment was verbal, and did not require the driver's signature.

Throughout the interventions, monitors kept track of the number of vehicles approached, the number of drivers who accepted a tool-kit, and the number of drivers who made the personal commitment to reduce idling. The results are in the Campaign Evaluation component of this report.

4.0 Campaign Evaluation

Overview

The success of the campaign was assessed through telephone surveys and measurements of idling at specific sites where interventions had been made.

4.1 Pre- and Post-Campaign Telephone Surveys

Two telephone surveys were conducted. The first was prior to the campaign, and the second was close to the end of the project timeline. The first offered a baseline against which success could be measured, particularly for the awareness aspect of the campaign, and to a lesser extent reported behaviour.

In each survey, more than 380 interviews were completed, giving results accurate to +/- 5%, 19 times out of 20.

In the first survey, it was observed that people could readily identify reasons that idling was a problem. Also, a large majority of people (about 80%) felt that unnecessary idling was a significant problem. Nonetheless, drivers admitted to having idled their vehicles at some time in the previous 7 days.

In the post-project survey, a similar number of people recognized that idling was a problem and what the problems were. Also, all drivers admitted to having idled their vehicles in the previous 7 days.

The most interesting difference in the two surveys was the recognition of publicity regarding idling. In the first survey, only 3 in 10 drivers could recall having seen information about idling. After the project, 60% of drivers could recall seeing information on idling.

The survey reports, complete with all of the survey data and analysis, accompany this report.

4.2 Interventions

Description

Interventions were made at municipal hotspots and transit locations as described above.

Results

Table 2 summarizes the general results of the interventions across all sites. A total of 413 vehicles were approached during the intervention period, with the majority of these drivers approached being male (69%).

In general, drivers were willing to talk to students about idling, with 79% of drivers agreeing to talk to the project monitors. Some of the main reasons provided by drivers as to why they could not talk to the monitors about idling included being in a rush and not having the time to talk, they were already engaged in a conversation on their cell phone, or they were just leaving.

Of the people who did talk to the monitors, there was a high degree of acceptance of the Idle Free Tool-kit (89%), and a high number of drivers who gave the verbal personal commitment to reduce idling (81%).

Only 20% of the drivers who took the tool-kit, 14% overall, used the window decal upon getting the tool-kit. However, although most drivers did not put the window decal on immediately, it is possible that the decal was used at a later date.

Table 2: Summary Data of Interventions With Drivers About Idling in HRM

Site	# of vehicles approached	% of drivers willing to engage in conversation about idling	% of drivers who engaged in conversation who took the tool-kit*	% of drivers who engaged in conversation who used window decal*	% of drivers who engaged in conversation who gave commitment to reduce idling*
Dartmouth Ferry	75	85%	79% (68%)	6% (4%)	73% (63%)
Dartmouth Bus	69	67%	89% (59%)	17% (10%)	93% (62%)
Mumford	50	80%	80% (64%)	28% (18%)	70% (56%)
Scotia Square	133	80%	96% (77%)	27% (21%)	83% (66%)
QE2 Dixon	86	79%	89% (71%)	18% (13%)	83% (66%)
ALL SITES	413	79%	89% (70%)	20% (14%)	81% (63%)

* Valued in brackets indicate percentage of total number of vehicles approached

Results were generally comparable across all sites, with a few exceptions. The Dartmouth Ferry site had the lowest number of people who agreed to talk to project monitors about idling. At this site, there were a large number of drivers approached who had already spoken to the monitors on previous days. These “returns” were noted as “didn’t talk” on the data collection

forms, decreasing the observed percentage of drivers willing to talk. The incidence of “returns” at this site is likely due to the regularity of the ferry and individual driver schedules.

At the Mumford Bus station, there were fewer drivers picking up passengers than seen at the other five sites. This resulted in the lowest number of interventions of all five sites visited.

Observations of Driver Perceptions towards Idling

In engaging drivers in conversation about idling, project monitors took note of the comments provided by drivers as to why they were or were not idling. Monitors especially noticed that drivers were pleased when praised for not idling, and that this changed the mood of the conversation and encouraged a longer conversation about idling in general.

Some of the key reasons stated by drivers as to why they idled or could not commit to reducing idling included: vehicle temperature control (to keep warm), especially when children or animals are in the vehicle; using electronics plugged into the car; difficulty in re-starting the vehicle once turned off; and forgetting to turn off the car.

At two sites specifically, the reasons given for idling were related to traffic bylaws. At the Scotia Square site on Market Street, drivers stated that they kept the vehicle engine running to wait in “no parking zones” while picking up their passenger, and felt that if they turned the car off they would acquire a ticket. Similarly, at the QE2 Dixon site on University Avenue, drivers left the car running while waiting for their passenger in order to be able to quickly move to a new location if a traffic agent was seen. Both of these situations point to the opportunity to reduce idling by modifying parking arrangements and “drop-off/pick-up” zones where drivers can wait and turn their vehicle off without concern about getting a ticket.

Key reasons stated by drivers as to why they would like to reduce idling included concerns about costs, greenhouse gases, and general environmental issues.

Data Analysis

After the interventions were completed, data collection on the frequency and duration of idling at all five sites was repeated as in the baseline data collection. Data was collected at each site for a period of 3 days, from 3:30 to 5:30 p.m. during the work week, from March 13th to March 24th. Statistical analyses were done in order to compare the incidence and duration of idling before and after the interventions were conducted. Table 3 summarizes the data on idling collected before and after the interventions.

Table 3: Comparison of Pre and Post Intervention Data of Idling Incidence and Duration in HRM

Site	Total # of observations		% of vehicles idling		Average # of vehicles idling per day		Average duration of idling per vehicle (minutes)	
	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER
Dartmouth Ferry	372	199	40%	54%	30	35.67	6.4	4.2
Dartmouth Bus	190	210	88%	22%	33.6	15.67	3.8	3.2
Mumford	208	29	83%	66%	41.6	6.33	8.8	5.0
Scotia Square	306	197	51%	47%	31.4	31.00	5.7	5.1
QE2 Dixon	236	153	83%	37%	39	19.00	5.8	2.8
ALL SITES	1312	868	61%	41%	33.5	21.53	5.4	4.1

Overall, the study showed a decrease in frequency of idling of 20%, and a reduction in the average duration of idling of 25%. Combining all sites, the number of vehicles idling per day and the length of time idling was significantly lower after the interventions.

Analysis by site location shows a statistically significant reduction in the amount of time spent idling at the Dartmouth Ferry site, and a reduction in the number of vehicles idling at the Dartmouth Bus site. The QE2 Dixon site shows a significant decrease in both the frequency of idling and the duration of idling after the interventions.

Weather is one factor that may have influenced the effect of the interventions observed. Due to the project schedule, it was not possible to have the pre and post data collection conducted more closely together in time or at the same time of year. As a result, weather ranged from 14 to 30 degrees in the baseline data collection, and from -8 to 7 degrees in the post data collection. Although this may have influenced results of idling seen in the HRM, studies have shown that idling frequency and duration is highest in periods of extreme weather, such as hot summer and cold winter days. As both pre and post data collection were conducted in temperature extremes, as opposed to bridging seasons such as Spring and Fall, it is reasonable to assume that the frequency and duration of idling is similar in the two seasons.

5.0 Sustaining the Campaign

The “Ladies and Gentlemen: Stop Your Engines” project has been successful in reducing idling behaviour. As a result of the project, there has been an increase in awareness of the problems associated with unnecessary vehicle idling. The project has demonstrated conclusively that Community-based Social Marketing is effective at getting people to change their idling behaviours.

5.1 Legacy Elements

Reduced Idling Toolkits

The Municipality has approximately 8,000 reduced idling toolkits which can be used to support community organizations and the PEER program going forward. The municipality will be able to distribute them as they see fit; investigation is currently being conducted to examine the feasibility of making them available through the municipality’s storefront operations.

PEER Program

The program has been established and will continue to be run by the Eco-Efficiency Centre, which is dedicated to making businesses environmentally sustainable. The Eco-Efficiency Centre is uniquely well-positioned to take on this task. The not-for-profit organization has worked with businesses to help them reduce their environmental footprint.

The PEER program is a unique program that employs Community-based Social Marketing and internet technology to establish a sustainable commitment on the part of businesses to reduce their idling and other sources of engine emissions. The program requires very little operating resources and is self-policing.

Reduced-Idling Policy

Currently, staff at HRM are developing a reduced-idling policy. If adopted, this policy will be enduring and will ensure that HRM employees make real reductions in the amount of idling that occurs as a result of HRM operations.

Community Organization Efforts

The HRM Reduced-Idling Project supported organizations that wished to assist in reducing the incidence of idling, such as the Kingswood Homeowners Association. HRM will be able to continue to support community groups by providing them with reduced-idling toolkits to distribute in their communities if they wish to build their own campaigns.

ATTACHMENT C

Partial Jurisdictional Scan of Idling Regulations in HRM and Nova Scotia

HRM presently has no by-laws or other regulations that focus exclusively on idling reduction at the community level. The closest such regulation is the Noise By-law¹ (N-200), which lists prohibited activities in Schedule A, including Part 3, section 1 that limits engine/motor idling for vehicles and auxiliary equipment to five minutes at all times in residential areas. There are exceptions prescribed in subsections 1(a) through (e) to accommodate idling during extreme temperatures, for vehicle maintenance and safe operation, and to power refrigeration and auxiliary equipment. HRM receives very few 311 calls concerning idling vehicles each year, and those that are received relate to engine noise from large trucks working in residential areas.

Other municipalities across Nova Scotia have addressed vehicle/equipment idling both internally and at the community level, using both public education and regulatory approaches. In 2008 the Town of Kentville became Atlantic Canada's first municipality with an idle-free by-law (limiting idling to less than 3 minutes), citing authorities under section 172 of the Municipal Government Act. The Town of Wolfville enacted a similar Idling Control Bylaw in 2011, while the Town of Antigonish took measures to prohibit truck and bus idling for more than 3 minutes in its 2013 Noise Control By-law. Some municipalities incorporated corporate anti-idling policies into their 2013 Municipal Climate Change Action Plans (e.g., Town of Amherst) or the 2010 Integrated Community Sustainability Plans (e.g., Town of Truro), while others developed stand-alone corporate idling reduction policies based on federal government educational resources (e.g., Town of Antigonish). The Cape Breton Regional Municipality, municipalities and economic stakeholders in the Annapolis Valley, and the Town of Annapolis Royal have also conducted idle-free public education campaigns.

Provincial and Federal Regulations on Idling

In 2010 the Province of Nova Scotia passed the Anti-Idling Act² imposing the requirement for all public passenger vehicle fleets, including Halifax Transit, to develop and implement an "anti-idling policy that promotes the reduction of unnecessary idling" by October 2011. Notably, Halifax Transit established its first idling policy prior to this legislation in March 2010; Transit's 2010 policy was repealed following adoption of the 2016 Policy Manual.

The Government of Nova Scotia's *Common Services Manual* includes an Anti-Idling Policy³ that limits idling to 60-seconds for all government owned, leased or rented vehicles or motorized equipment, or privately-owned vehicles used for government business. The Policy's restrictions also restrict idling within 30 metres of open windows, building ventilation system intakes, and entrances to workplaces.

At present Canada has no federal regulations controlling vehicle engine idling. Under the 2003 On-Road Vehicle and Engine Emissions Regulations (Canadian Environment Protection Act), Environment and Climate Change Canada's Energy and Transportation Directorate sets emissions standards for all on-road vehicles and their engines sold in Canada. However, neither those regulations, nor the 2014 Heavy-duty Vehicle and Engine Greenhouse Gas Emissions Regulations, speak directly to idling reduction. Natural Resources Canada's Office of Energy Efficiency continues to operate the "Idle-Free Zone" website, which offers policy and educational resources to municipalities and fleet managers to help curb idling, including a model Idling Control By-law⁴, and the *FleetSmart* program⁵ for commercial and institutional vehicle fleets. Materials provided via the "Idle-Free Zone" helped to inform HRM's 2006 Reduced Idling Program

¹ https://www.halifax.ca/sites/default/files/documents/city-hall/legislation-by-laws/By-lawN-200_0.pdf

² <https://nslegislature.ca/sites/default/files/legc/statutes/antidling.htm>

³ <https://novascotia.ca/treasuryboard/manuals/PDF/300/30711-03.pdf>

⁴ As discussed, HRM's Reduced Idling Program considered the model by-law, but opted for educational measures instead. <http://www.nrcan.gc.ca/node/4405>

⁵ http://www.nrcan.gc.ca/energy/efficiency/transportation/commercial-vehicles/fleetsmart/16930?fuseaction=fleetsmart_idle

ATTACHMENT D

Discussion of HRM's Policies, Program and Plans, Including Fleet Fuel & Emissions Monitoring

Internal Policies, Programs and Plans

At a strategic level HRM's approaches to reducing vehicle and equipment idling fall under the *Healthy, Livable Communities* Council Priority Area outlined in the municipality's 2017-21 Strategic Plan. This Council Priority Area links to the Energy and Environment Priority Outcome, which seeks to build resiliency by providing leadership in energy management, sustainability and environmental risk management – both as an organization and in the community we serve.

At an operational level, the staff-focused tools and approaches to reduce municipal idling and fleet emissions listed in Table 1 are reflected in HRM's Values ('sustainability') and Administrative Priority Areas ('financial responsibility', 'our people' and 'health & safety') outlined in the Strategic Plan. Ultimately those policies underlie and support Council's Healthy, Livable Communities priority outcomes¹.

Table 1 – Tools Forming HRM's Policy and Planning Framework with respect to Idling

Tool Type?	Name of Tool/Approach	Scope of Tool/Approach
Policy	2008 HRM Vehicle Anti-Idling Policy <i>This Policy was an internal response to HRM's 2006 Reduced Idling Program campaign "Ladies and Gentlemen, Stop Your Engines" (Attachment D)</i>	<ul style="list-style-type: none"> Organization-wide policy to limit all engine idling to 1-minute or less. Policy aims to reduce air pollution from vehicle and equipment exhaust; promote energy conservation; reduce noise pollution; reduce wear and tear on municipal vehicles and equipment; and reduce vehicle/equipment-related operational costs. Outlines 7 exceptions that apply to safety, operational requirements, extreme weather, maintenance, Transit buses and emergency vehicles. Use of drive-through services is not permitted and is considered unnecessary idling. Cites reduction of air pollution and greenhouse gases as part of rationale.
Policy	2009 Sustainable Procurement Initiative ² : Vehicle Right Sizing Filter and Life Cycle Analysis Methodology	<ul style="list-style-type: none"> Applies to all general fleet vehicle purchases Includes a Vehicle Requirements Form and SUV Justification Form, and compares new vehicle options based on relative fuel efficiency and emissions.
Prgm	2010 Green Fleet Initiatives: HRM Fleet Fuel Consumption Reduction Program (2011-2013)	<ul style="list-style-type: none"> Short-term Partnership Agreement with Clean Nova Scotia to leverage additional funding to undertake actions to reduce fleet fuel consumption and associated GHG emissions, and to adapt the FleetWiser program to train and monitor HRM fleet drivers. Goals were to reduce idling and fleet fuel consumption by 5 to 10% (no evaluation stats were available).
Policy	2011 HRM Fleet Use Policy	<ul style="list-style-type: none"> Applies to light-duty vehicles and administrative vehicles only. Provides for the use of AVL devices to monitor all fleet vehicles and their activity.
Policy	2014 HRM Operator's Manual – Motor Vehicle Operators	<ul style="list-style-type: none"> Applies to all drivers of HRM vehicles. Includes <i>Statement of Policies on Alcoholic Beverages; Illegal Substances; Medical Limitations; Cell Phone Usage; Smoking; and, Anti-Idling</i>. The 2008 Anti-Idling Policy is appended to the Manual.
Policy	2015 Anti-Idling Standard Operating Procedure, 2015M-01 (Attachment C)	<ul style="list-style-type: none"> Applies to all Corporate Fleet vehicles including emergency and heavy-duty/utility units. Intended to reinforce the 2008 anti-idling policy and refers to exceptions listed therein, as well as vehicle/equipment manufacturer's safe operating practices.

¹ <https://www.halifax.ca/sites/default/files/documents/city-hall/standing-committees/171026tsc12.1.3.pdf>

² <http://legacycontent.halifax.ca/council/agendasc/documents/090707ca1115.pdf>

Policy	2016 Halifax Transit Policy Manual (Operational Policies, section 3)	<ul style="list-style-type: none"> Applies to all transit drivers and staff using fleet vehicles, and includes layovers and engine warm-up periods. Aligns with HRM's 2008 anti-idling policy and cites the same exceptions to the 1-minute rule.
Priority Plan	2012-2020 Corporate Plan to Reduce Greenhouse Gas (GHG) Emissions	<ul style="list-style-type: none"> Highlights the importance of reducing fleet vehicle fuel consumption and engine idling to achieve HRM's GHG emissions reduction target of 30% below 2008 levels by 2020. Calls for annual data collection & monitoring of fleet vehicle and equipment fuel consumption, GHG emissions and idling time (via AVL devices)
Priority Plan	2016 Community Energy Plan Update Report ³ : 2-year strategy towards a new 10-year Community Energy Plan	<ul style="list-style-type: none"> Addresses both corporate and community actions to help the municipality reduce energy consumption and GHG emissions and arrive at a more energy efficient, sustainable, livable, and greener community. Outlines actions to implement driver training for HRM's fleet drivers and ongoing use of the anti-idling policy.

In addition to the framework outlined in Table 1, HRM includes messaging in its driver training programs to encourage idling reduction, and Halifax Transit includes SmartDriver principles in its basic operator training program (in partnership with the Canadian Urban Transit Association and Natural Resources Canada).

Monitoring Fleet Fuel Consumption, Idling and GHG Emissions

The 2012-2020 Corporate Plan to Reduce GHG Emissions outlines a series of practical strategies to help the Municipality achieve its 2020 target to reduce GHG emissions by 30% below 2008 levels. The Plan targets reductions in energy consumption in municipal buildings, for outdoor lighting (including traffic signals), and by fleet vehicles and equipment, which accounted for 67%, 24% and 9%, respectively, of HRM's corporate GHG emissions of 88,720 tonnes of carbon dioxide-equivalent (t CO₂e) in 2008. Within the fleet category, corporate fleet vehicles are responsible for 58% of emissions, with police vehicles (32%) and fire (10%) contributing the remainder. No metrics are available to accurately calculate the emissions already resulting from idling, but this Priority Plan outlines the potential for a 33% reduction overall in vehicle fleet GHG emissions by 2020, from 7,693 to 5,179 t CO₂e. That reduction would result from reduced idling through changes in driver habits (i.e., training and better policy implementation; 136 t CO₂e reduction), technological add-ons to reduce the need for idling (i.e., block heaters, auxiliary power units, vehicle cabin heaters; up to 729 t CO₂e reduction), procurement of hybrid vehicles that do not idle in traffic, and installation of AVL devices in all fleet vehicles. To manage emissions and evaluate progress toward the 2020 target, the Plan also calls for annual data collection and monitoring related to fleet vehicles and equipment, including:

- Fuel consumption, type of fuel, and type of vehicle (including vehicle class)
- Cost of fuel
- Kilometres travelled
- km travelled / litre of fuel consumed (i.e., fuel economy)
- kg CO₂e / km travelled (i.e., emissions intensity)
- Idling time (via AVL devices)

Fleet vehicle and equipment fuel consumption and GHG emissions are monitored on an annual basis under this Plan. Prior to the installation of AVL devices, only a portion of fleet vehicle odometers were recorded on a regular basis, typically during fuelling stops. Equipment fuel consumption is only tracked via fuel pump transactions. The AVL systems provide data that can be used to estimate the relative fuel economy and emissions intensity of vehicles over time.

In 2015 HRM began installing AVL devices in its corporate fleet vehicles under contract with Northern Business Intelligence (NBI). Approximately 60 winter operations vehicles were initially outfitted, with street sweeping vehicles and signboard trucks outfitted in a second phase. By 2017 all corporate fleet vehicles (excluding Halifax Regional Police and Halifax Transit) were equipped with AVL devices capable of tracking

³ See CEP 2016 Update: 2-year strategy towards a new 10-year CEP https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/HRM%20Community%20Energy%20Plan%20-%202016%20Update%20Report_0.pdf

a vehicle's geographic position (including customized geographic zones created by HRM), engine operation and status, driver behaviour (e.g., harsh acceleration, speeding), fuel consumption and idling activity in real-time. The AVL devices collect continuous data that is logged in an online database. Custom reports can then be generated and sent directly to fleet supervisors, line managers and team leaders to highlight compliance statistics – including violations of custom rules (e.g., using a drive-through service).

Halifax Transit buses are equipped with a limited form of AVL system that transmits real-time information on the geographic position and total trip kilometres travelled for each bus. This type of system is called an Automated Vehicle Monitoring system (AVM) and despite being able to send some engine warnings to fleet managers, does not include functionality to monitor engine idling or fuel consumption. Halifax Transit's Technology Roadmap calls for investment in bus sensors that could provide enhanced tracking of, and reporting on, bus operation metrics (including engine idling).

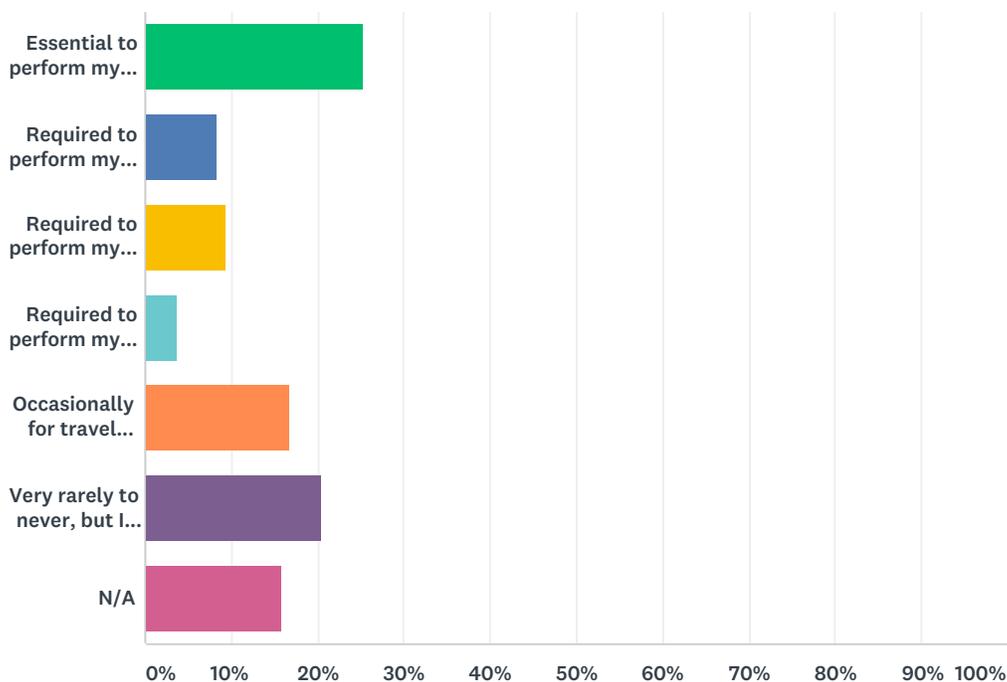
Halifax Regional Police fleet vehicles, like Transit buses, are equipped with a proprietary AVL system. Adoption of the Grip Idle Management system for Police fleet was investigated as part of the 2011-2013 HRM Fleet Fuel Reduction Program⁴. However, the system was found to not be a suitable fit for the HRP fleet given space requirements for the add-on devices.

⁴ <http://legacycontent.halifax.ca/boardscom/SCenv/documents/130207essc713R.pdf>.

Raw Results of 2018 Employee Survey on HRM's Anti-Idling

Q1 Which of the following best describes your use of municipal vehicles or equipment?

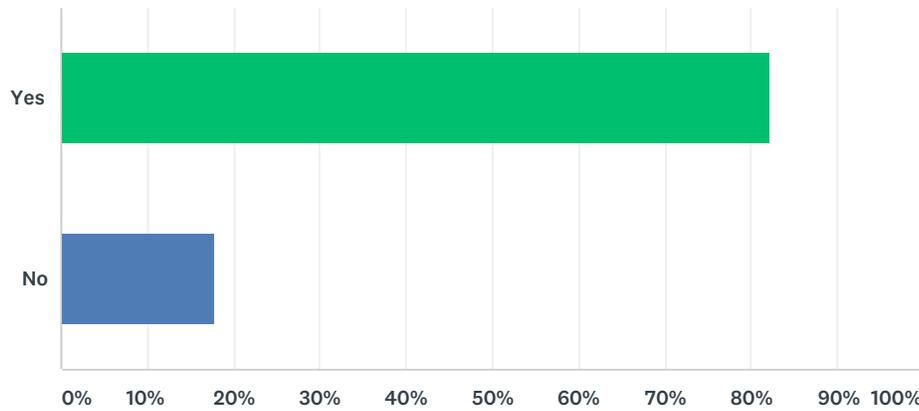
Answered: 107 Skipped: 0



ANSWER CHOICES	RESPONSES	
Essential to perform my duties, almost 100% of the time	25.23%	27
Required to perform my duties, more than 50% of the time	8.41%	9
Required to perform my duties, 25-50% of the time	9.35%	10
Required to perform my duties, less than 25% of the time	3.74%	4
Occasionally for travel within the municipality (e.g., business meetings, events, etc.)	16.82%	18
Very rarely to never, but I am authorized to use municipal vehicles and/or equipment	20.56%	22
N/A	15.89%	17
TOTAL		107

Q2 Before receiving this survey request, were you aware of Halifax's 2008 Vehicle Anti Idling Policy?

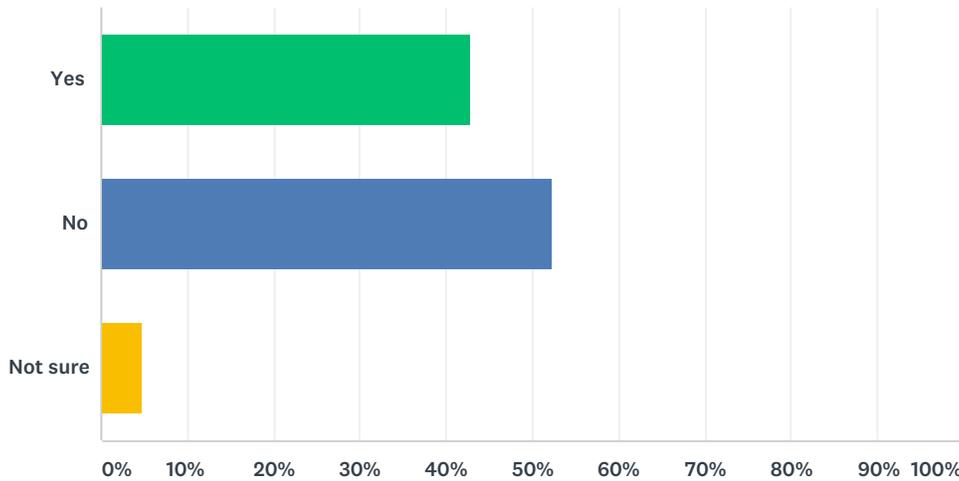
Answered: 107 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	82.24%	88
No	17.76%	19
TOTAL		107

Q3 There are seven exceptions listed in the Vehicle Anti Idling Policy that reflect operational needs and protect human health and safety. Those exceptions apply only under the following circumstances: For vehicle maintenance and diagnosis purposes (to be kept to a minimum) Under extreme weather conditions or any other time when the health and safety of the employee or others may be jeopardized. To enable proper snow/ice clearing from vehicles. If the unit is not expected to be able to restart due to a mechanical problem. In this case, the vehicle is to be sent to Fleet Services for repair. Vehicles that need to be running to support operational requirements or while on an emergency scene Transit vehicles in revenue service while carrying passengers. Engine is immediately required to power auxiliary equipment. (Hoist, lift platforms, hydraulic pumps, water pumps, etc.) This Policy does not apply to typical stop and go traffic or when the unit is used for traffic control and is required to be running. Do any of the exceptions highlighted in bold text describe the circumstances in which you typically use municipal vehicles and/or equipment? For example, to respond to emergencies.

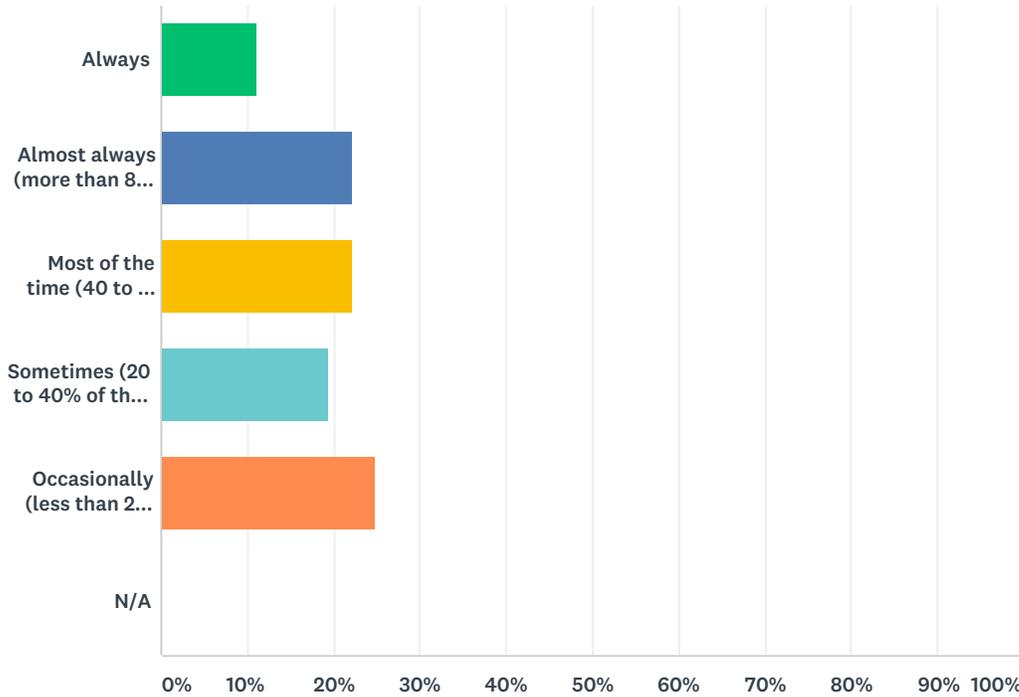
Answered: 84 Skipped: 23



ANSWER CHOICES	RESPONSES	
Yes	42.86%	36
No	52.38%	44
Not sure	4.76%	4
TOTAL		84

Q4 If you answered “yes” to question 3, which of the following best describes how often the Policy’s exceptions apply to you when using municipal vehicles and/or equipment? Remember, all responses are anonymous.

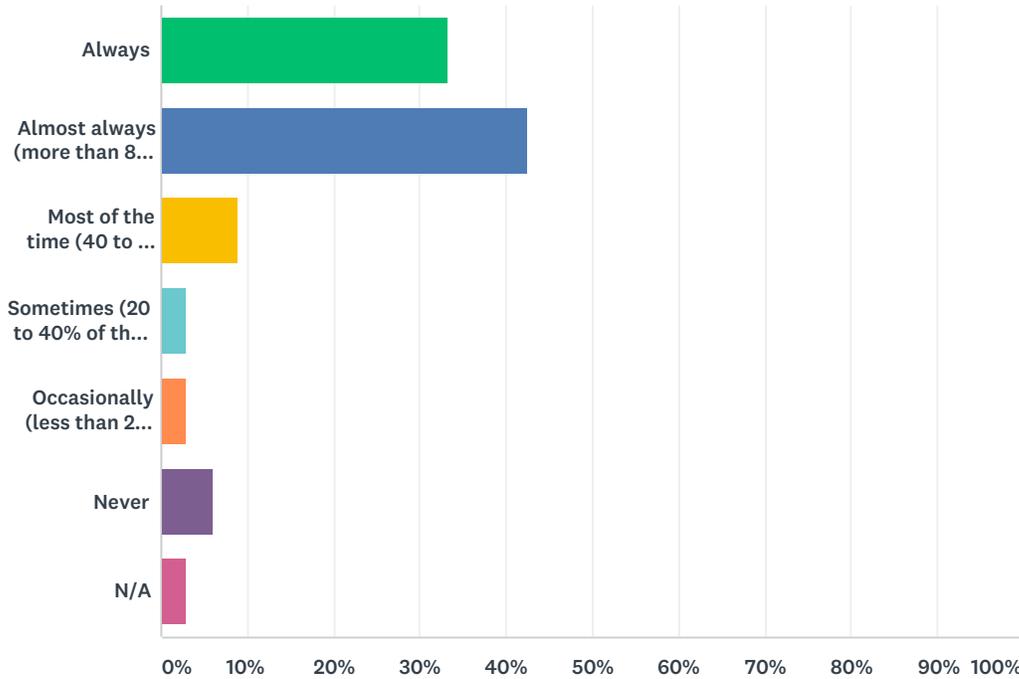
Answered: 36 Skipped: 71



ANSWER CHOICES	RESPONSES	
Always	11.11%	4
Almost always (more than 80% of the time)	22.22%	8
Most of the time (40 to 80% of the time)	22.22%	8
Sometimes (20 to 40% of the time)	19.44%	7
Occasionally (less than 20% of the time)	25.00%	9
N/A	0.00%	0
TOTAL		36

Q5 When the Policy’s exceptions do not apply, how often do you try to limit engine idling when driving municipal vehicles and/or using equipment? Remember, all responses are anonymous.

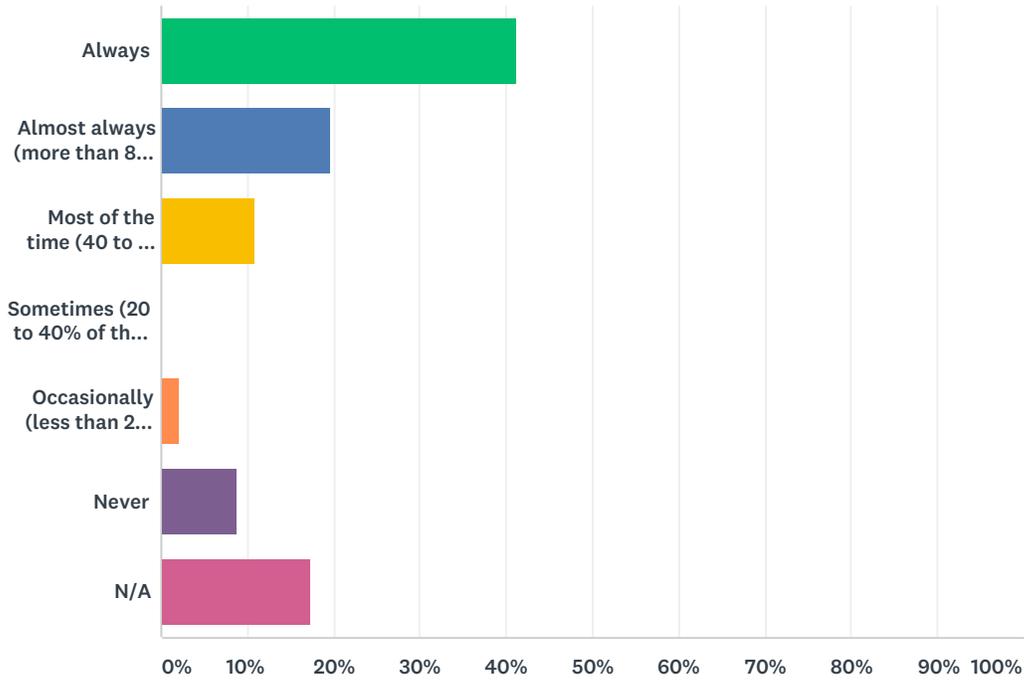
Answered: 33 Skipped: 74



ANSWER CHOICES	RESPONSES	
Always	33.33%	11
Almost always (more than 80% of the time)	42.42%	14
Most of the time (40 to 80% of the time)	9.09%	3
Sometimes (20 to 40% of the time)	3.03%	1
Occasionally (less than 20% of the time)	3.03%	1
Never	6.06%	2
N/A	3.03%	1
TOTAL		33

Q6 If you answered “No” or “Not sure” to question 3, how often would you say you apply the Vehicle Anti Idling Policy when driving municipal vehicles and/or using equipment? Remember, all responses are anonymous.

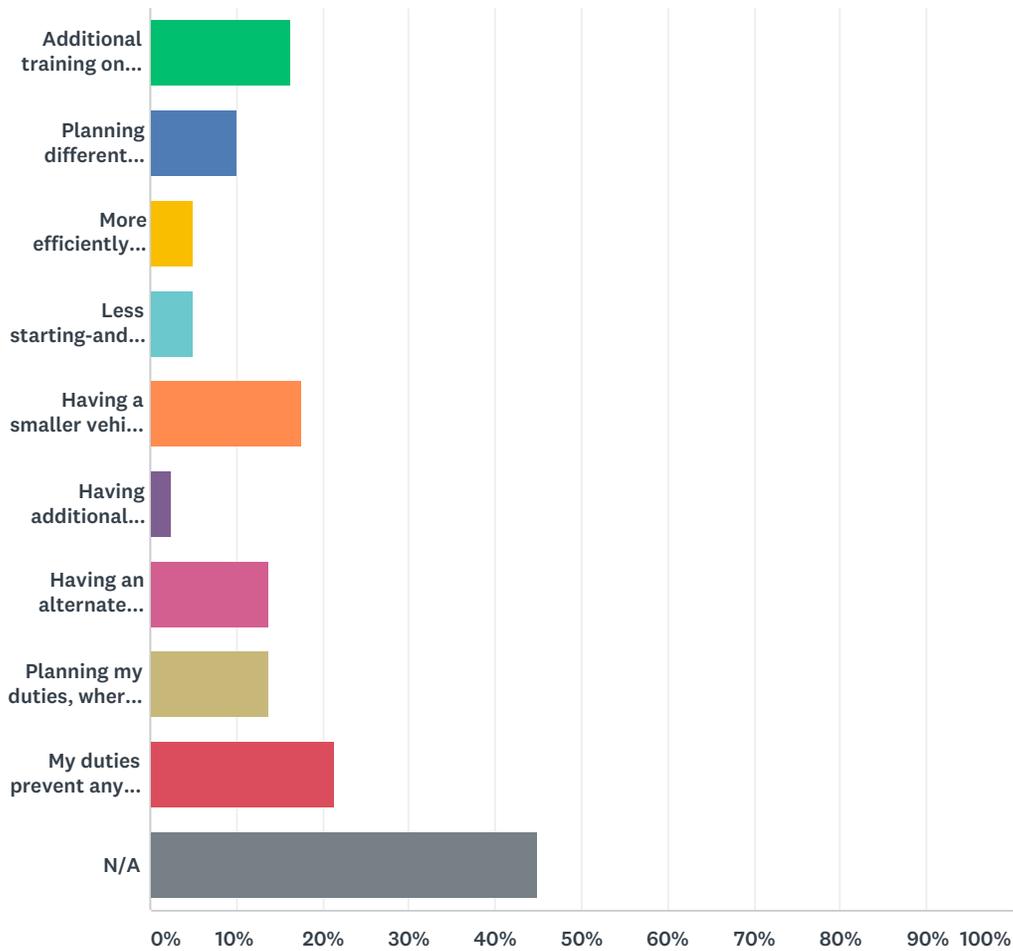
Answered: 46 Skipped: 61



ANSWER CHOICES	RESPONSES	
Always	41.30%	19
Almost always (more than 80% of the time)	19.57%	9
Most of the time (40 to 80% of the time)	10.87%	5
Sometimes (20 to 40% of the time)	0.00%	0
Occasionally (less than 20% of the time)	2.17%	1
Never	8.70%	4
N/A	17.39%	8
TOTAL		46

Q7 Which of the following would help you apply the Vehicle Anti Idling Policy more often? Check all that apply.

Answered: 80 Skipped: 27



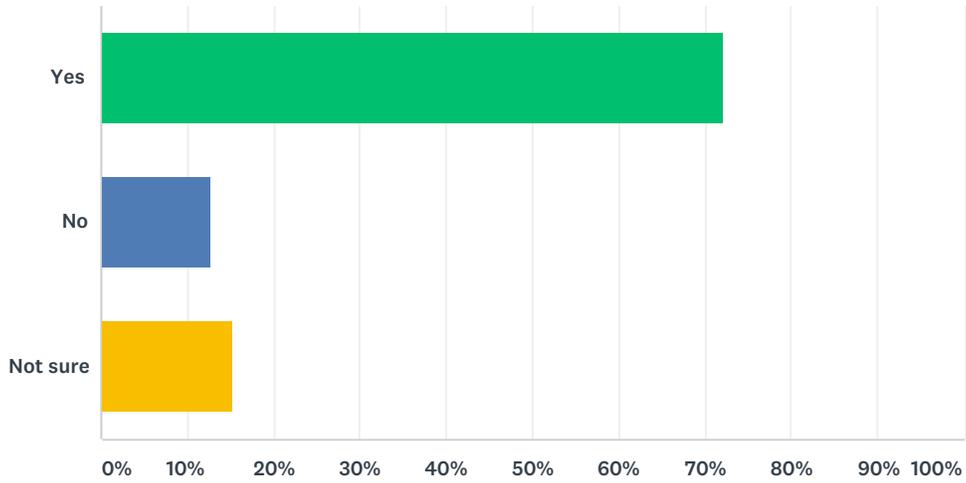
ANSWER CHOICES	RESPONSES	
Additional training on low-emissions driving techniques	16.25%	13
Planning different routes for work-related travel	10.00%	8
More efficiently using equipment at a job site	5.00%	4
Less starting-and-stopping to perform my duties	5.00%	4
Having a smaller vehicle to perform my duties	17.50%	14
Having additional pieces of equipment to perform my duties	2.50%	2
Having an alternate source of power for auxiliary equipment	13.75%	11
Planning my duties, where possible, for days/times of the day not affected by temperature extremes	13.75%	11
My duties prevent any further reduction of idling	21.25%	17
N/A	45.00%	36

Vehicle Anti Idling Policy

Total Respondents: 80

Q8 Do you feel that the existing Vehicle Anti Idling Policy is appropriate for the municipality? Please choose one of the following below.

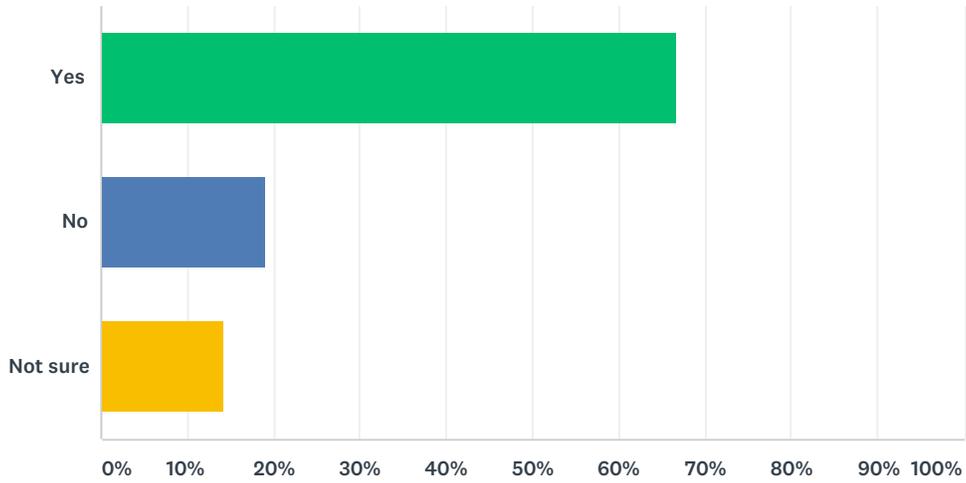
Answered: 79 Skipped: 28



ANSWER CHOICES	RESPONSES	
Yes	72.15%	57
No	12.66%	10
Not sure	15.19%	12
TOTAL		79

Q9 Do you think the municipality should have a Vehicle Anti Idling Policy?
Please choose one of the following below.

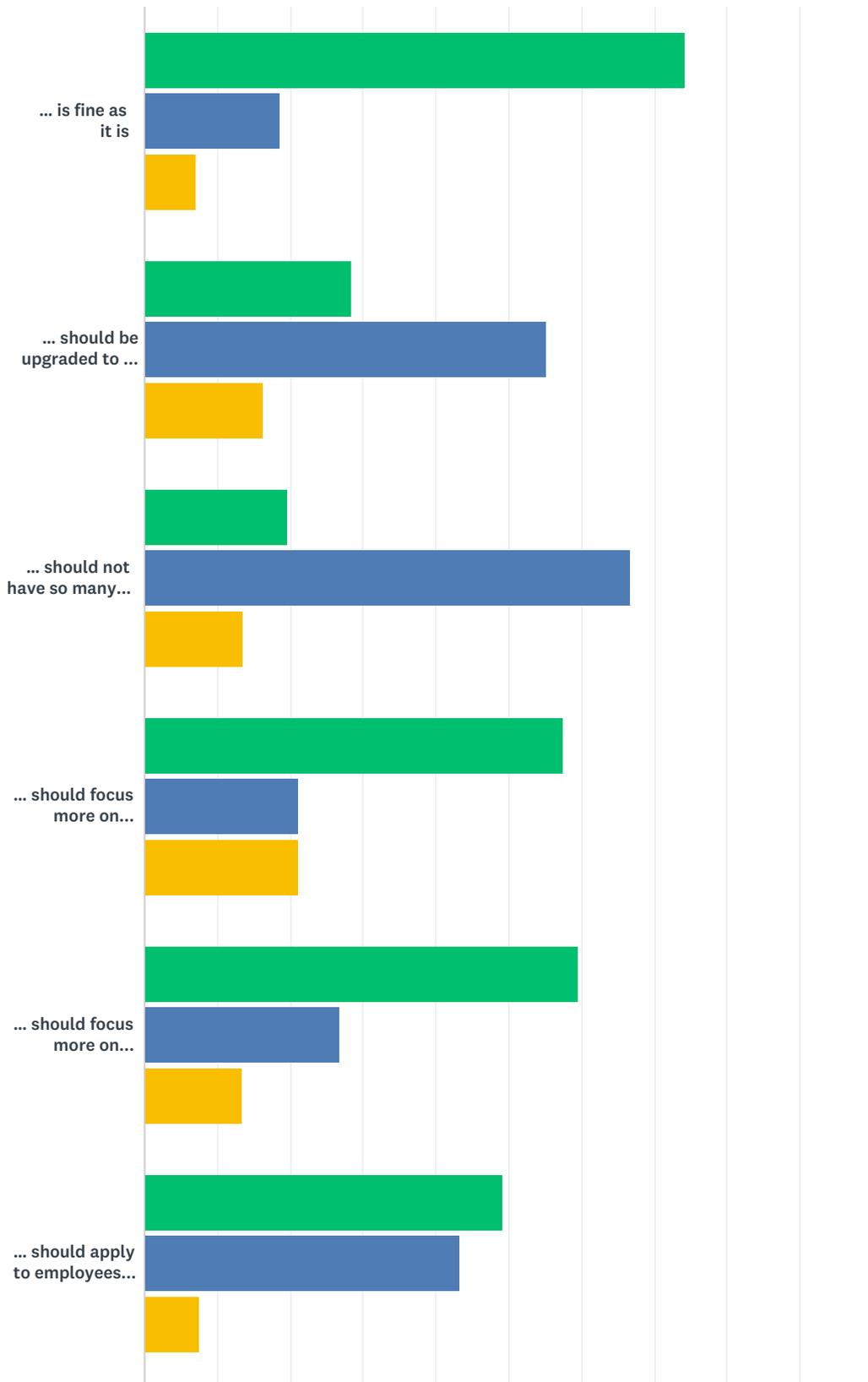
Answered: 21 Skipped: 86



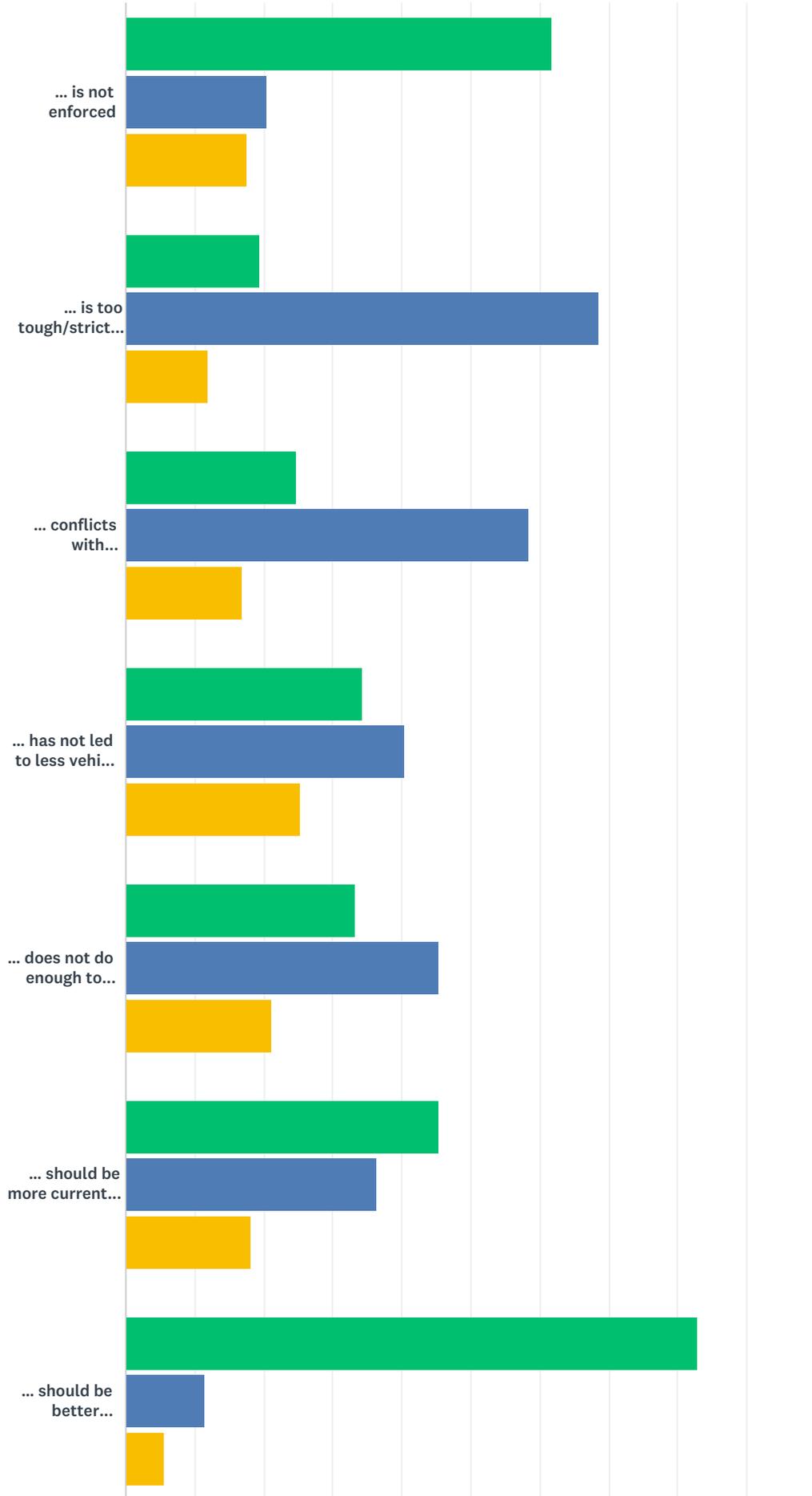
ANSWER CHOICES	RESPONSES
Yes	66.67% 14
No	19.05% 4
Not sure	14.29% 3
TOTAL	21

Q10 Please expand on your last answer by checking any of the following statements that apply. In my opinion, the Vehicle Anti Idling Policy...

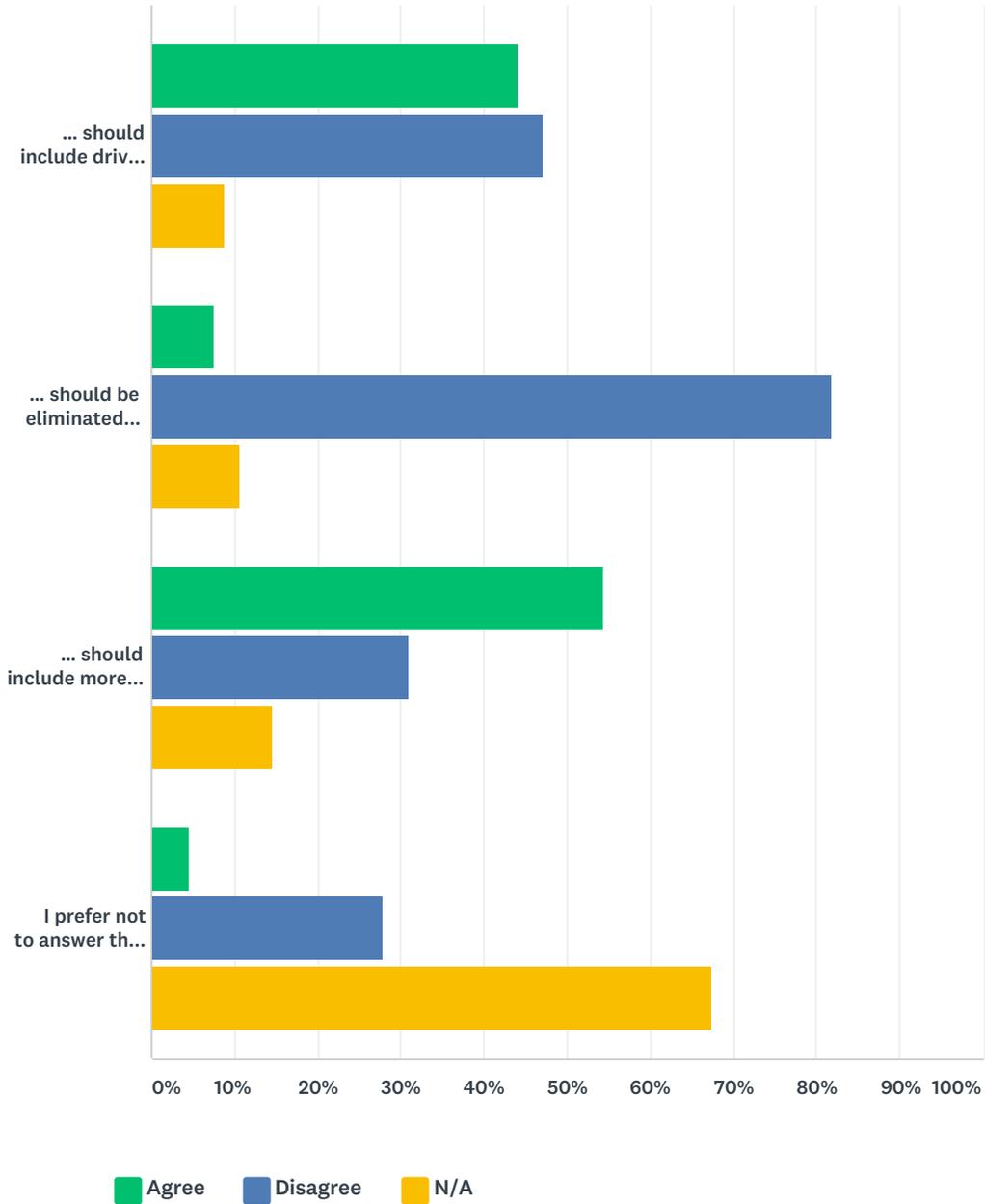
Answered: 76 Skipped: 31



Vehicle Anti Idling Policy



Vehicle Anti Idling Policy



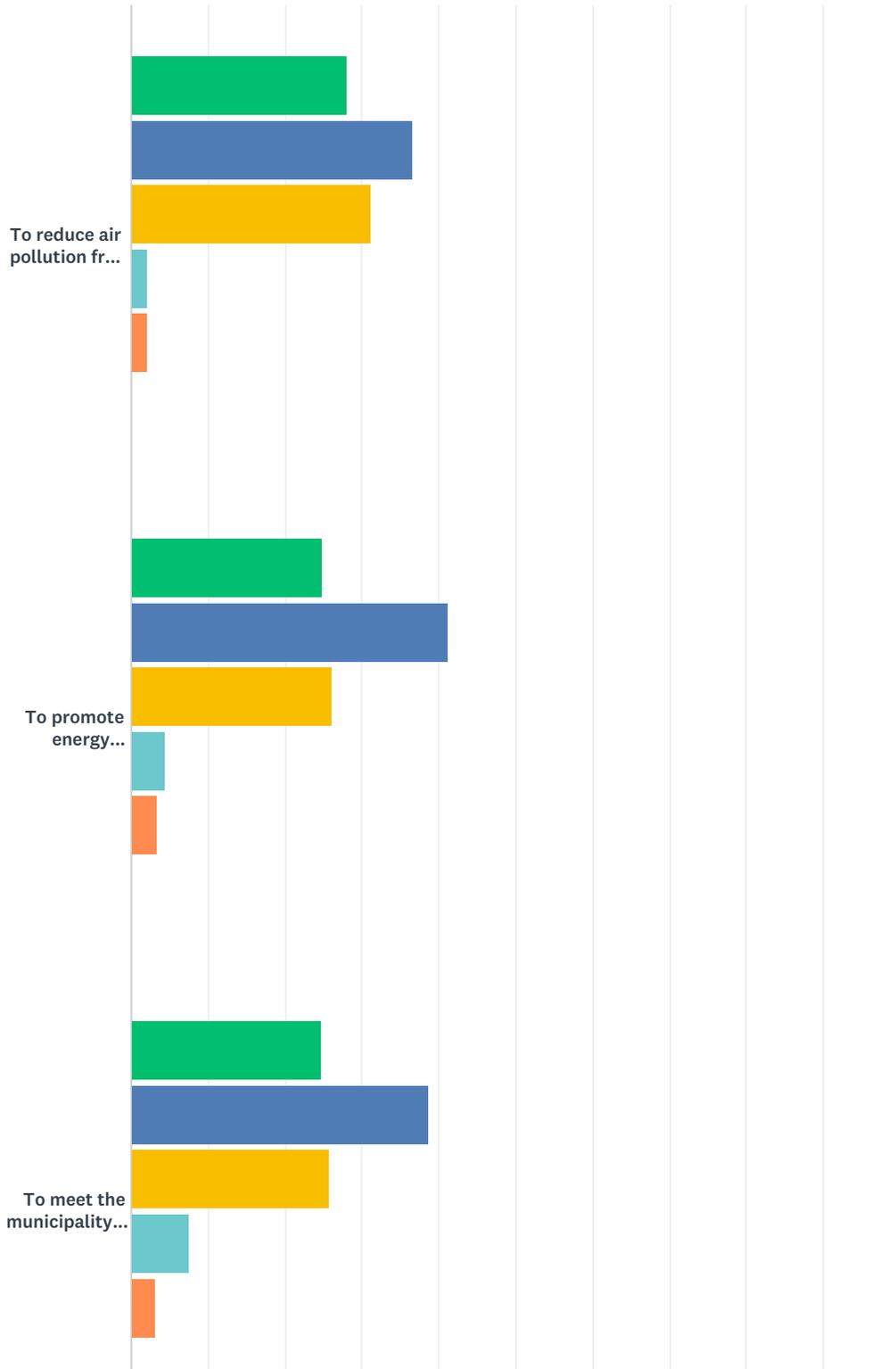
		AGREE	DISAGREE	N/A	TOTAL
... is fine as it is	a	74.29% 52	18.57% 13	7.14% 5	70
... should be upgraded to an Administrative Order	b	28.36% 19	55.22% 37	16.42% 11	67
... should not have so many exceptions	c	19.70% 13	66.67% 44	13.64% 9	66
... should focus more on environment benefits	d	57.58% 38	21.21% 14	21.21% 14	66
... should focus more on reducing operational costs	e	59.70% 40	26.87% 18	13.43% 9	67
... should apply to employees using personal vehicles for work	f	49.25% 33	43.28% 29	7.46% 5	67
... is not enforced	g	61.76% 42	20.59% 14	17.65% 12	68

Vehicle Anti Idling Policy

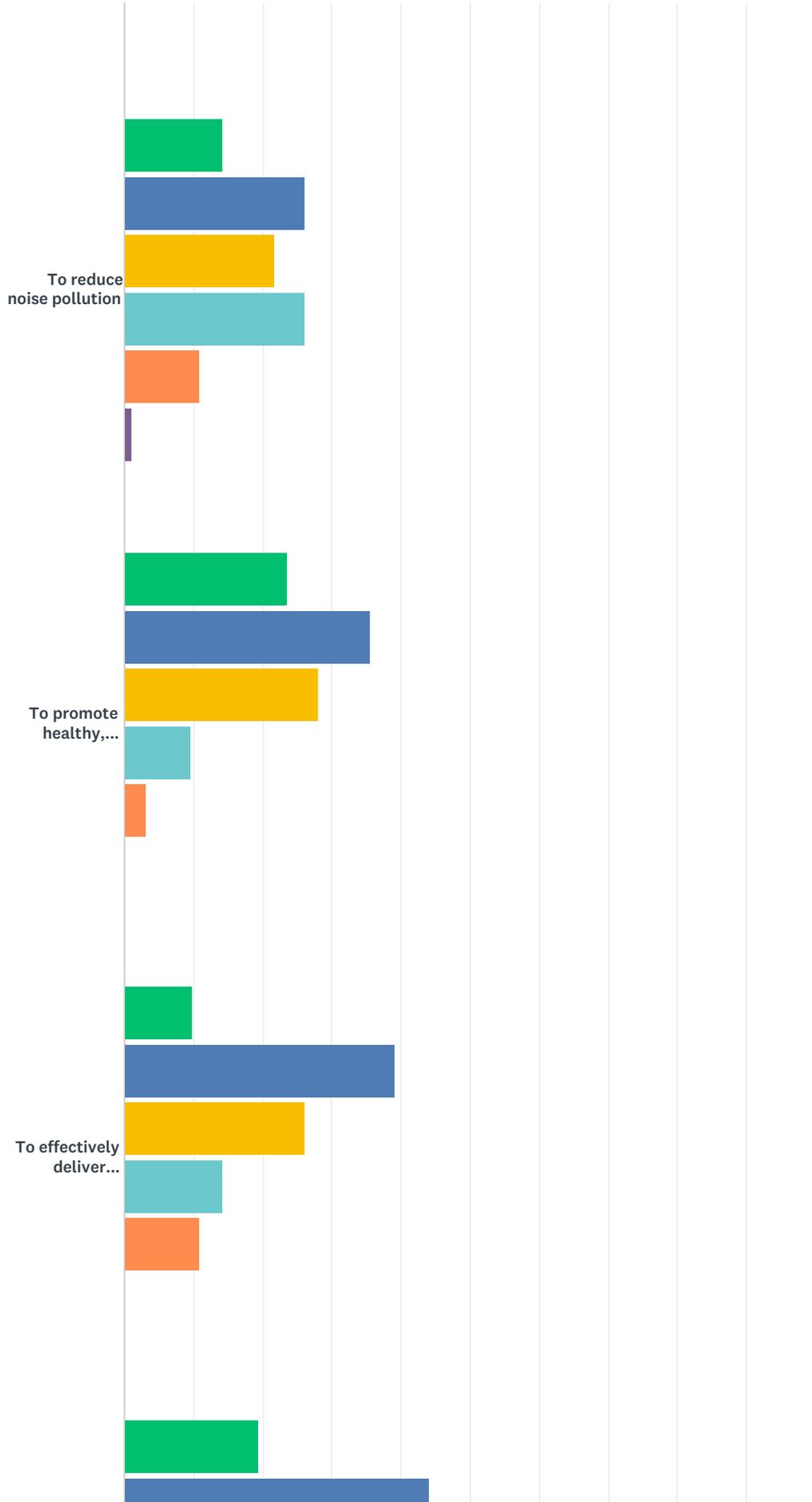
... is too tough/strict, even with the current exceptions	h	19.40% 13	68.66% 46	11.94% 8	67
... conflicts with operational/duty requirements	i	24.62% 16	58.46% 38	16.92% 11	65
... has not led to less vehicle or equipment idling	j	34.33% 23	40.30% 27	25.37% 17	67
... does not do enough to reduce idling	k	33.33% 22	45.45% 30	21.21% 14	66
... should be more current – it's outdated	l	45.45% 30	36.36% 24	18.18% 12	66
... should be better communicated to municipal employees	m	82.86% 58	11.43% 8	5.71% 4	70
... should include driver training	n	44.12% 30	47.06% 32	8.82% 6	68
... should be eliminated altogether	o	7.58% 5	81.82% 54	10.61% 7	66
... should include more incentives for good driving	p	54.41% 37	30.88% 21	14.71% 10	68
I prefer not to answer this question	r	4.65% 2	27.91% 12	67.44% 29	43

Q11 In your opinion, how important is it for the municipality to have a Vehicle Anti Idling Policy that applies to all employees operating municipal vehicles and/or equipment? Please rank each of the reasons below from left (critical) to right (not at all necessary or n/a)

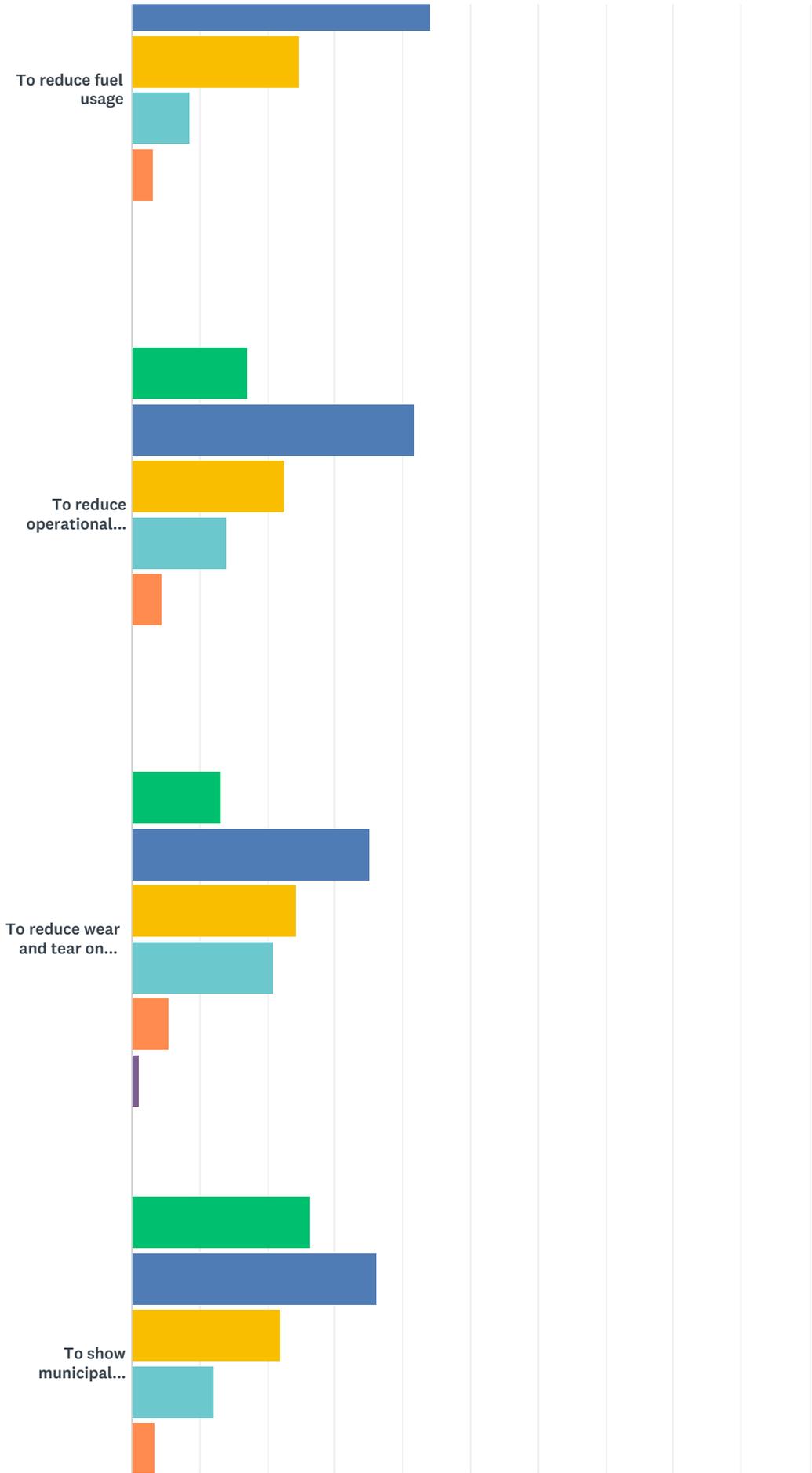
Answered: 93 Skipped: 14



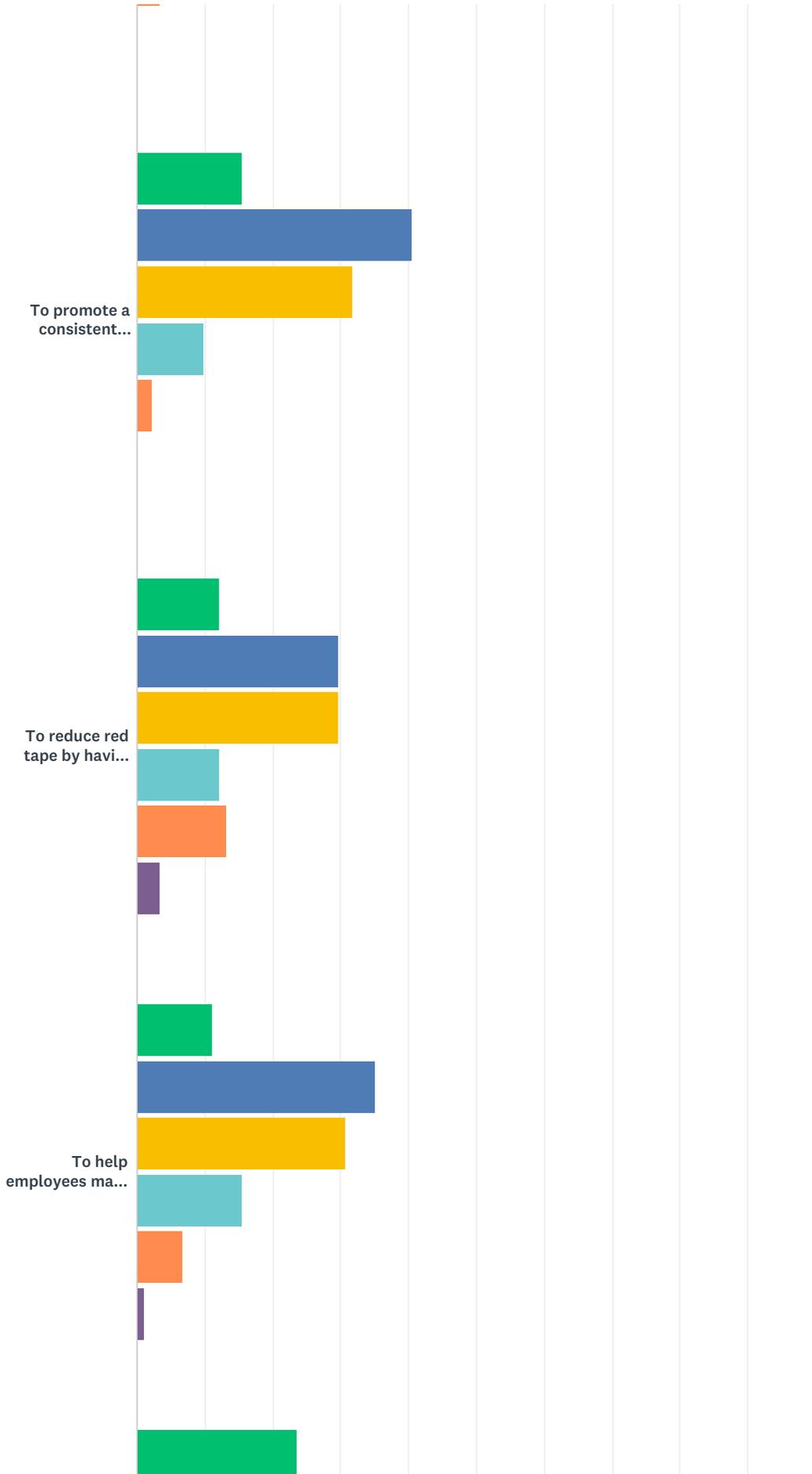
Vehicle Anti Idling Policy



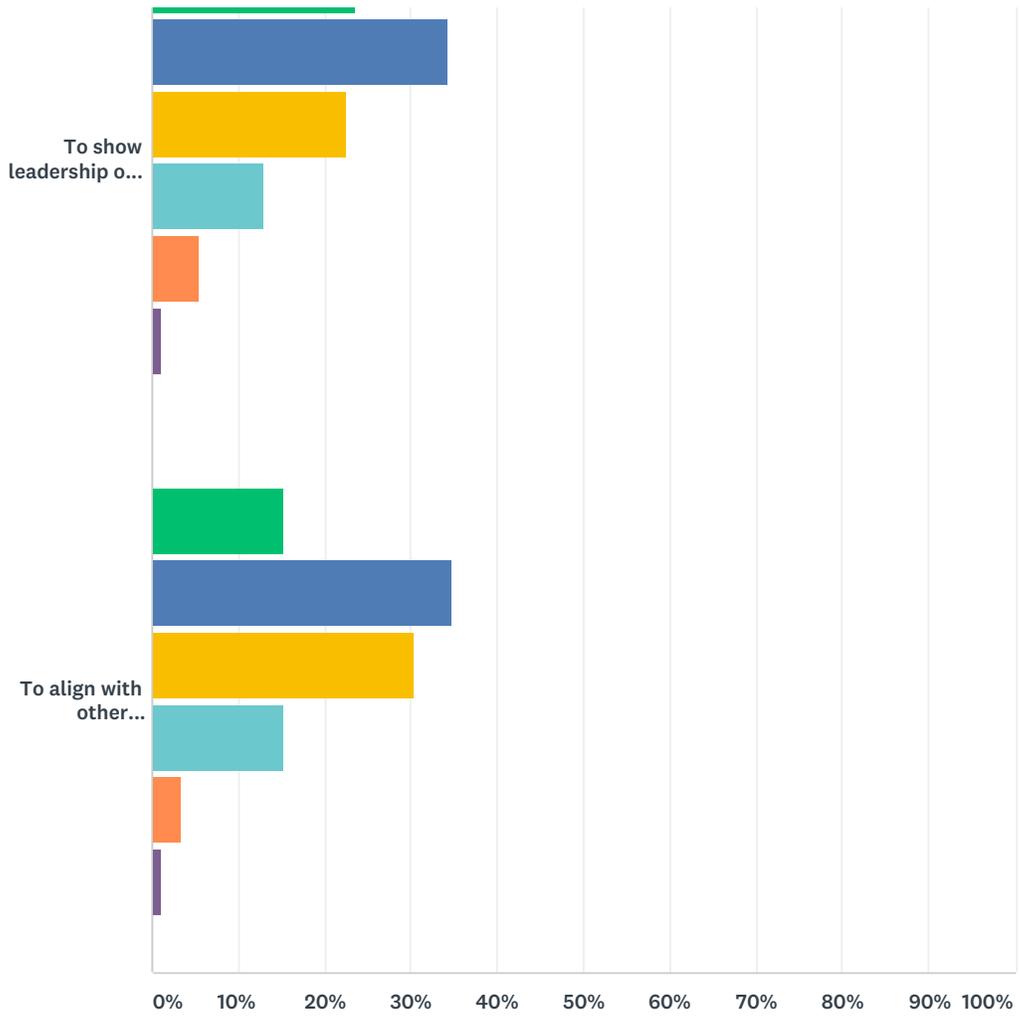
Vehicle Anti Idling Policy



Vehicle Anti Idling Policy



Vehicle Anti Idling Policy



■ Critical
 ■ Very important
 ■ Important
 ■ Somewhat important
■ Not at all necessary
 ■ N/A

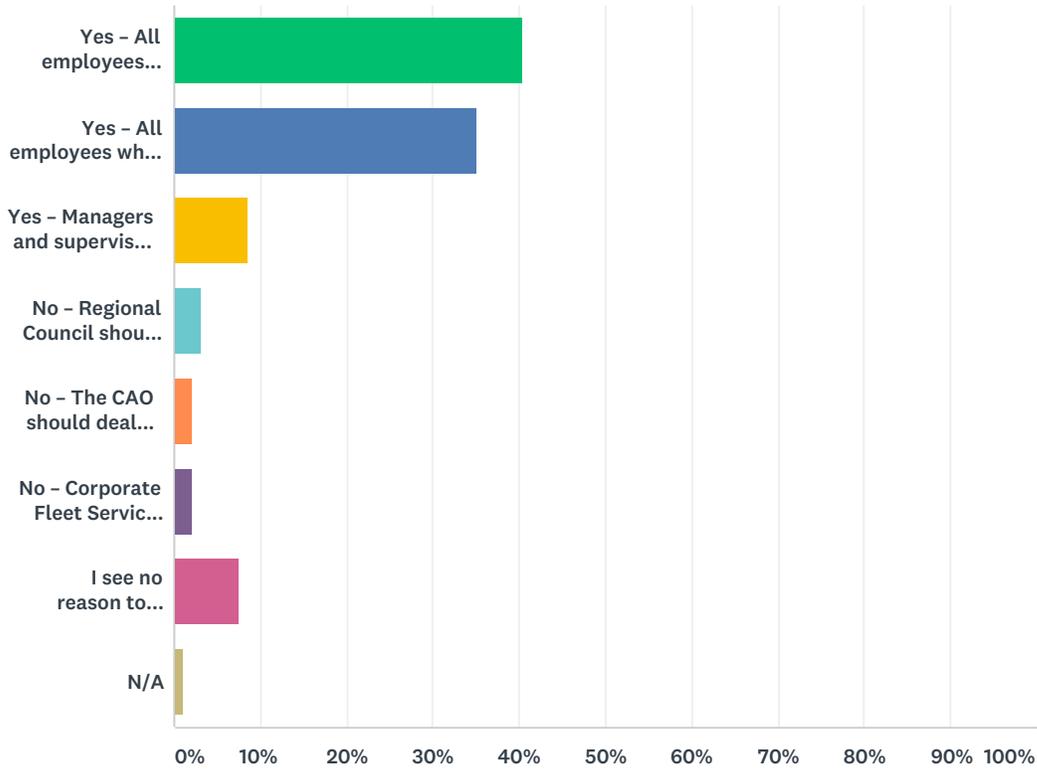
		CRITICAL	VERY IMPORTANT	IMPORTANT	SOMEWHAT IMPORTANT	NOT AT ALL NECESSARY	N/A	TOTAL
To reduce air pollution from vehicle and equipment exhaust	a	27.96% 26	36.56% 34	31.18% 29	2.15% 2	2.15% 2	0.00% 0	93
To promote energy conservation	b	25.00% 23	41.30% 38	26.09% 24	4.35% 4	3.26% 3	0.00% 0	92
To meet the municipality's 2020 goal to reduce corporate greenhouse gas emissions by 30% below 2008 levels	c	24.73% 23	38.71% 36	25.81% 24	7.53% 7	3.23% 3	0.00% 0	93
To reduce noise pollution	d	14.13% 13	26.09% 24	21.74% 20	26.09% 24	10.87% 10	1.09% 1	92
To promote healthy, livable communities	e	23.66% 22	35.48% 33	27.96% 26	9.68% 9	3.23% 3	0.00% 0	93
To effectively deliver municipal services	f	9.78% 9	39.13% 36	26.09% 24	14.13% 13	10.87% 10	0.00% 0	92
To reduce fuel usage	g	19.35% 18	44.09% 41	24.73% 23	8.60% 8	3.23% 3	0.00% 0	93

Vehicle Anti Idling Policy

To reduce operational costs	h	17.20% 16	41.94% 39	22.58% 21	13.98% 13	4.30% 4	0.00% 0	93
To reduce wear and tear on municipal vehicles and equipment	i	13.19% 12	35.16% 32	24.18% 22	20.88% 19	5.49% 5	1.10% 1	91
To show municipal leadership on tackling climate change	j	26.37% 24	36.26% 33	21.98% 20	12.09% 11	3.30% 3	0.00% 0	91
To promote a consistent approach with all employees to reducing idling	k	15.38% 14	40.66% 37	31.87% 29	9.89% 9	2.20% 2	0.00% 0	91
To reduce red tape by having a Policy instead of an Administrative Order	l	12.09% 11	29.67% 27	29.67% 27	12.09% 11	13.19% 12	3.30% 3	91
To help employees make good driving decisions	m	10.99% 10	35.16% 32	30.77% 28	15.38% 14	6.59% 6	1.10% 1	91
To show leadership on climate issues for other NS municipalities	n	23.66% 22	34.41% 32	22.58% 21	12.90% 12	5.38% 5	1.08% 1	93
To align with other government and corporate policies on idling	o	15.22% 14	34.78% 32	30.43% 28	15.22% 14	3.26% 3	1.09% 1	92

Q12 Should municipal employees, including Halifax Transit and Halifax Regional Police, be given the opportunity to provide feedback on any changes to the Vehicle Anti Idling Policy?

Answered: 94 Skipped: 13

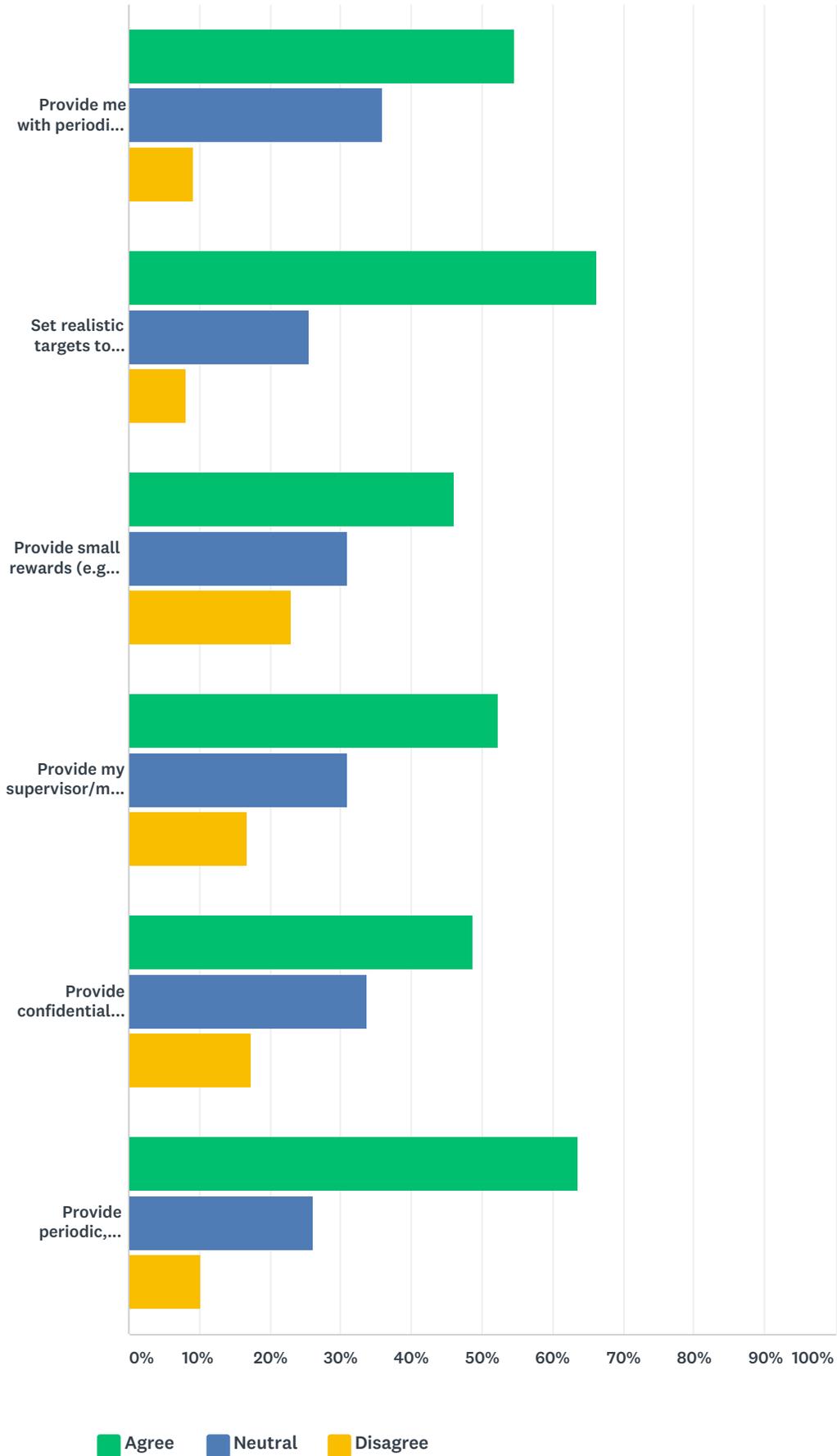


ANSWER CHOICES	RESPONSES	
Yes – All employees should provide feedback	40.43%	38
Yes – All employees who use municipal vehicles and/or equipment in the performance of their duties should provide feedback	35.11%	33
Yes – Managers and supervisors should provide feedback on behalf of their teams	8.51%	8
No – Regional Council should deal with this matter	3.19%	3
No – The CAO should deal with this matter	2.13%	2
No – Corporate Fleet Services should deal with this matter	2.13%	2
I see no reason to change the existing Policy	7.45%	7
N/A	1.06%	1
TOTAL		94

Q13 Options for Driver or Operator Feedback?

Answered: 89 Skipped: 18

Vehicle Anti Idling Policy



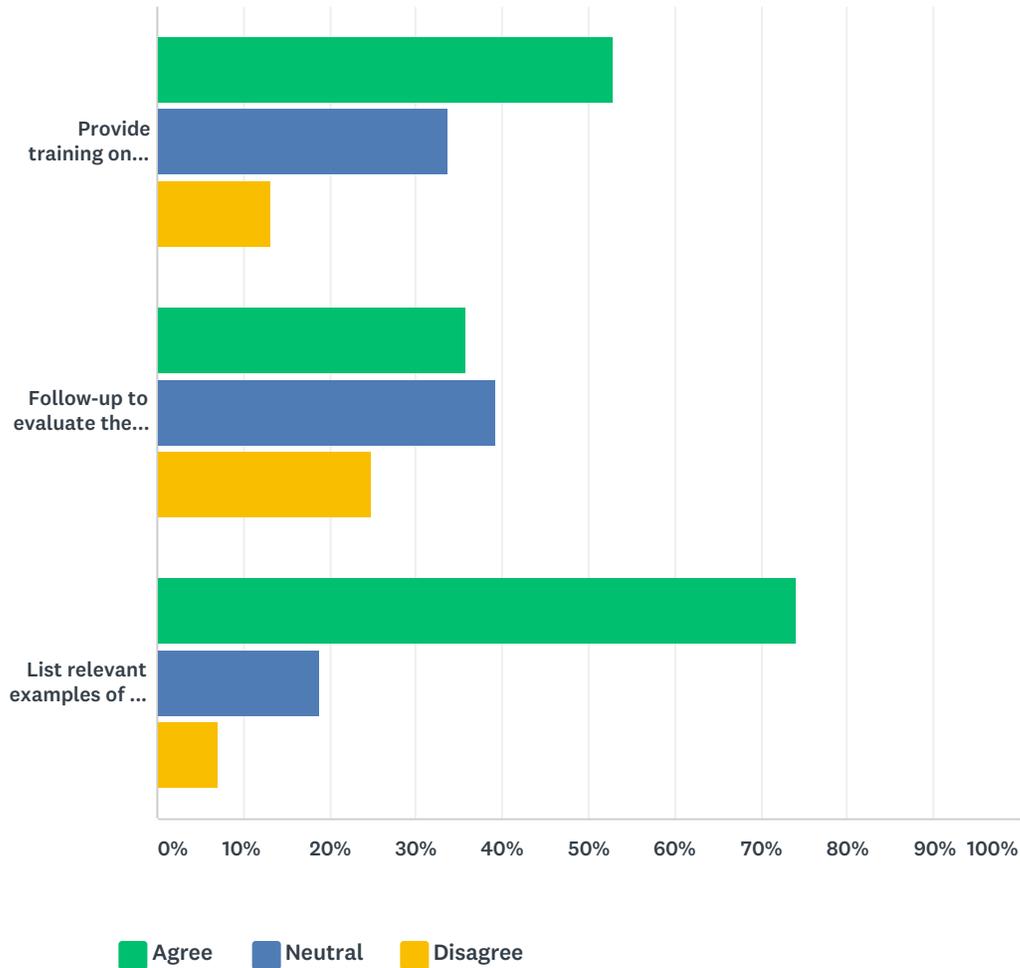
	AGREE	NEUTRAL	DISAGREE	TOTAL
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Vehicle Anti Idling Policy

Provide me with periodic, confidential feedback on my idling habits and/or fuel consumption; most fleet vehicles are equipped with devices that automatically monitor idling	54.65% 47	36.05% 31	9.30% 8	86
Set realistic targets to reduce my idling and/or fuel consumption over time	66.28% 57	25.58% 22	8.14% 7	86
Provide small rewards (e.g., \$5 coffee card) if I reduce my idling and/or fuel consumption and reach my targets as expected	45.98% 40	31.03% 27	22.99% 20	87
Provide my supervisor/manager with periodic, anonymous feedback on my team's idling habits and/or fuel consumption	52.38% 44	30.95% 26	16.67% 14	84
Provide confidential feedback on how my idling habits and/or fuel usage compare(s) to others in my BU	48.84% 42	33.72% 29	17.44% 15	86
Provide periodic, anonymous idling stats for the whole municipal fleet, e.g., via the Employee Hub emails	63.64% 56	26.14% 23	10.23% 9	88

Q14 Additional Training options?

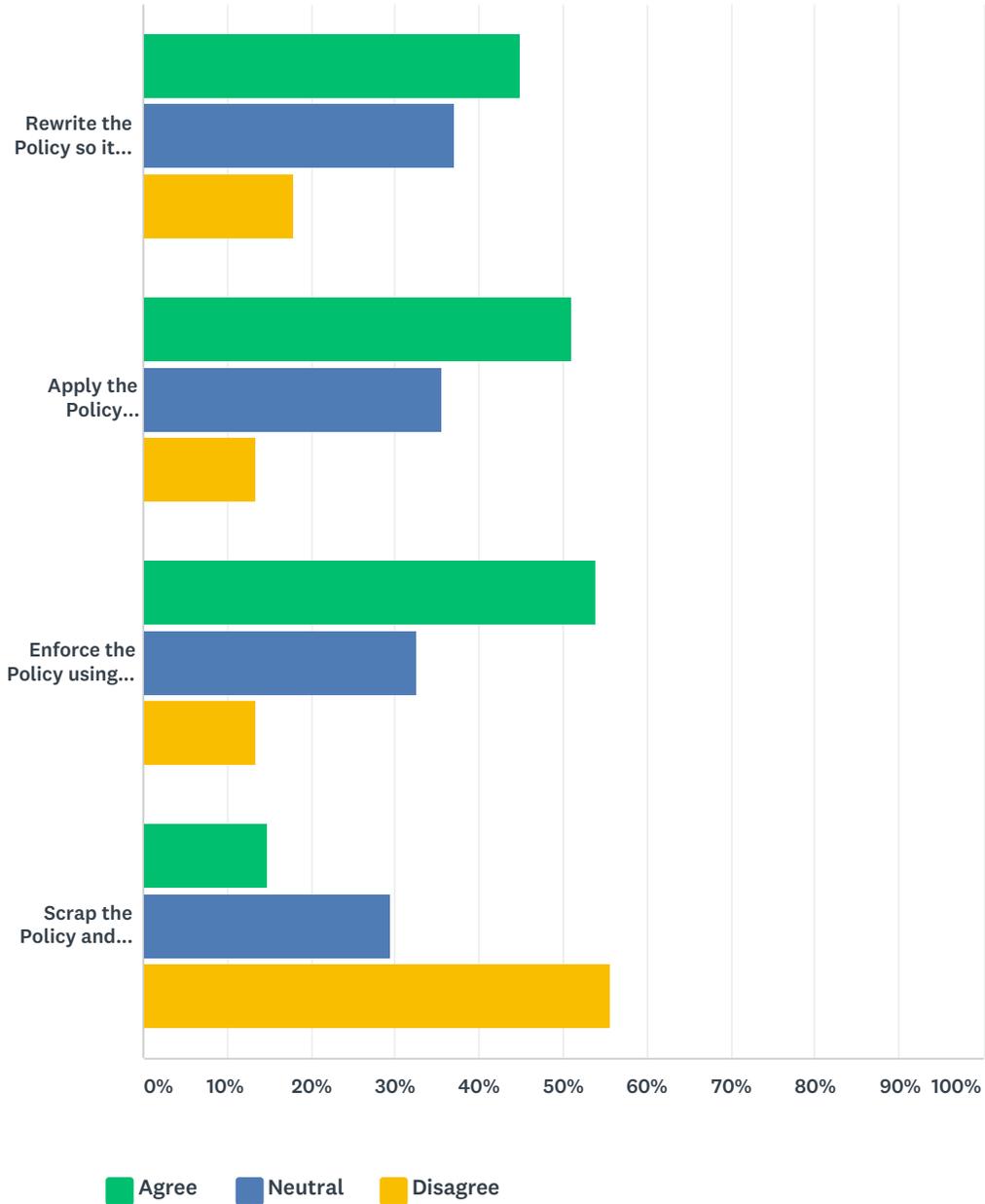
Answered: 86 Skipped: 21



	AGREE	NEUTRAL	DISAGREE	TOTAL
Provide training on tips to reduce idling, e.g., video on the intranet, in-person feedback	53.01% 44	33.73% 28	13.25% 11	83
Follow-up to evaluate the success of training, and provide small rewards (e.g., \$5 coffee card) if my idling and/or fuel consumption has decreased	35.71% 30	39.29% 33	25.00% 21	84
List relevant examples of how to reduce idling in an attachment to the Policy, tailored to each BU's day-to-day operations	74.12% 63	18.82% 16	7.06% 6	85

Q15 Better Enforcement options?

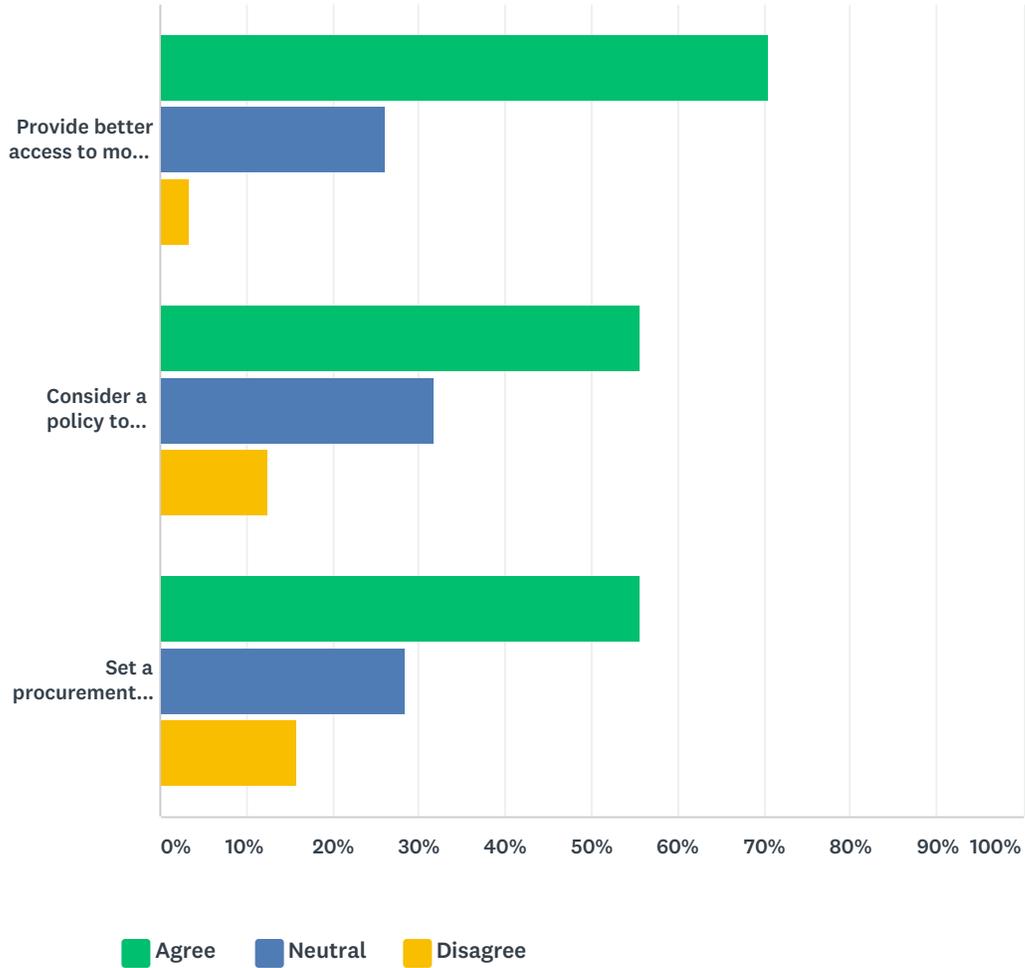
Answered: 91 Skipped: 16



	AGREE	NEUTRAL	DISAGREE	TOTAL
Rewrite the Policy so it is specific to each BU and accounts for operational differences across the organization	44.94% 40	37.08% 33	17.98% 16	89
Apply the Policy seasonally to avoid temperature and weather extremes	51.11% 46	35.56% 32	13.33% 12	90
Enforce the Policy using data collecting from vehicle/equipment monitoring systems, where installed	53.93% 48	32.58% 29	13.48% 12	89
Scrap the Policy and trust that municipal vehicle/equipment users will limit idling and/or fuel consumption on their own	14.77% 13	29.55% 26	55.68% 49	88

Q16 Options to Use Different Vehicles and/or Equipment?

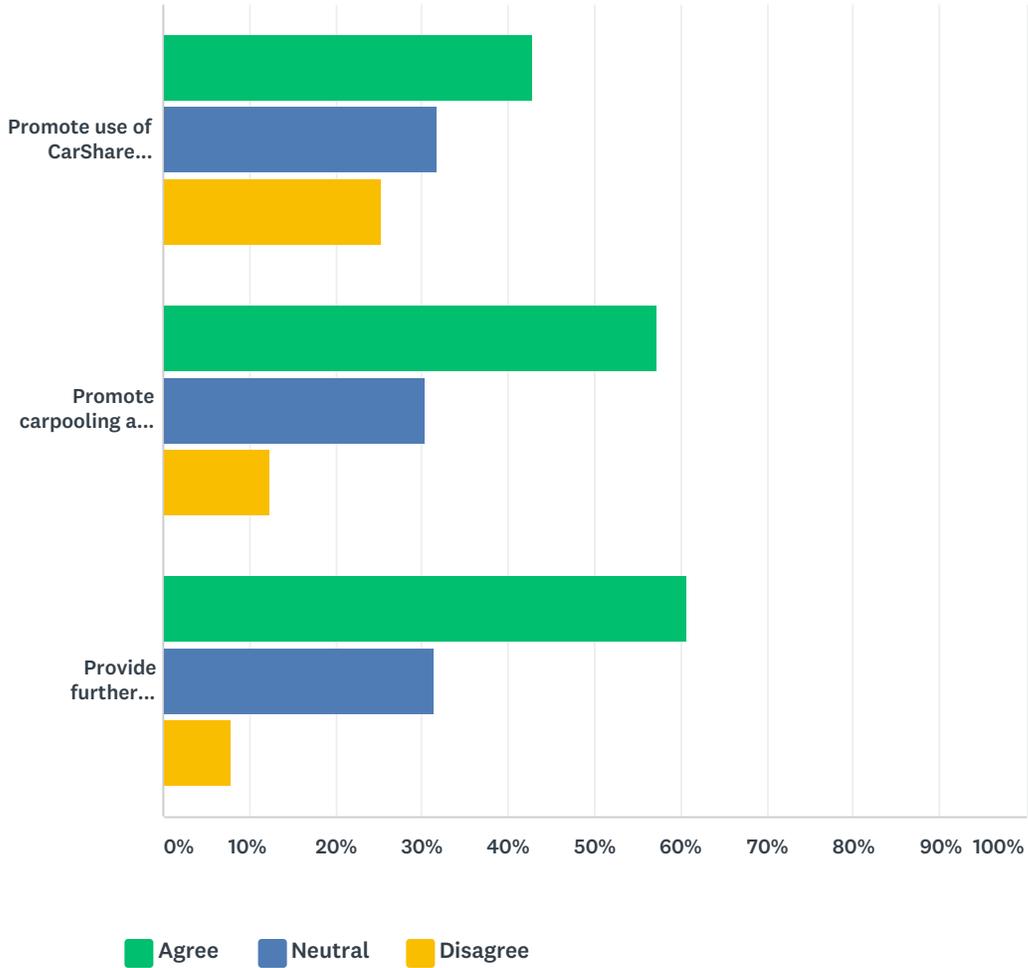
Answered: 90 Skipped: 17



	AGREE	NEUTRAL	DISAGREE	TOTAL
Provide better access to more fuel-efficient fleet vehicles and equipment	70.45% 62	26.14% 23	3.41% 3	88
Consider a policy to replace old fleet vehicles with Electric Vehicles (EVs), Hybrid/Plug-in Hybrid EVs, and/or alternative fuel vehicles (e.g., compressed natural gas, hydrogen fuel-cell)	55.68% 49	31.82% 28	12.50% 11	88
Set a procurement policy for each BU that promotes the purchase of electric, hybrid and alternative fuel equipment whenever possible	55.68% 49	28.41% 25	15.91% 14	88

Q17 Options for Transportation Alternatives?

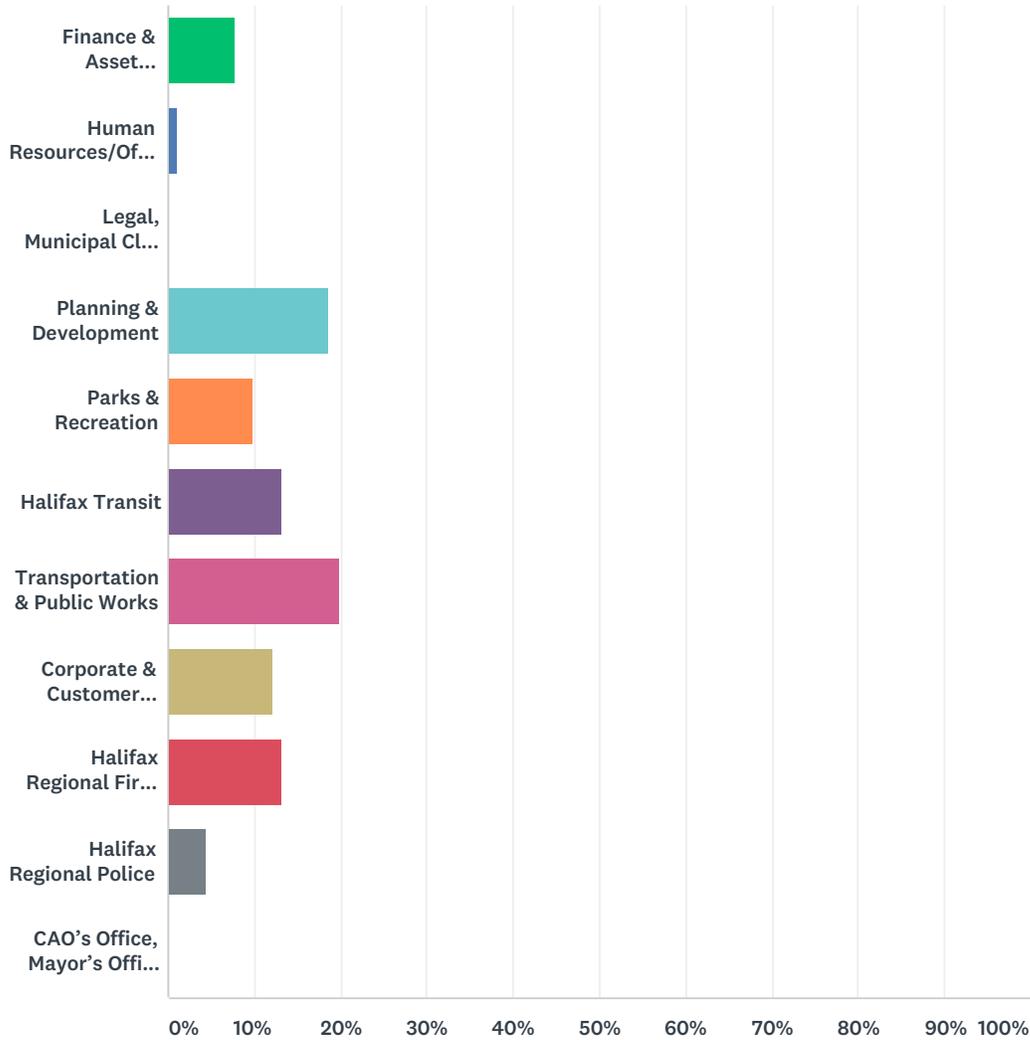
Answered: 91 Skipped: 16



	AGREE	NEUTRAL	DISAGREE	TOTAL
Promote use of CarShare Atlantic (carshareatlantic.ca) by municipal employees	42.86% 39	31.87% 29	25.27% 23	91
Promote carpooling and ride-sharing for employees using municipal vehicles to perform their duties, where appropriate	57.30% 51	30.34% 27	12.36% 11	89
Provide further savings/cost incentives to municipal employees who enroll in Halifax Transit's EPass Program	60.67% 54	31.46% 28	7.87% 7	89

Q18 Please help us understand a bit more about the Policy’s reach within the municipality by selecting your team’s Business Unit from the list below. Remember, all responses are anonymous.

Answered: 91 Skipped: 16



ANSWER CHOICES	RESPONSES
Finance & Asset Management	7.69% 7
Human Resources/Office of Diversity & Inclusion	1.10% 1
Legal, Municipal Clerk & External Affairs	0.00% 0
Planning & Development	18.68% 17
Parks & Recreation	9.89% 9
Halifax Transit	13.19% 12
Transportation & Public Works	19.78% 18
Corporate & Customer Services	12.09% 11

Vehicle Anti Idling Policy

Halifax Regional Fire & Emergency	13.19%	12
Halifax Regional Police	4.40%	4
CAO's Office, Mayor's Office Admin or Council Support Office	0.00%	0
TOTAL		91

Q19 Please share any additional comments with us in the space below. (Optional)

Answered: 18 Skipped: 89

ATTACHMENT F

Figures Illustrating Detailed Responses to Questions 13 through 17 of the Employee Survey

The final questions of the employee survey focused on potential corporate actions and strategies to reduce vehicle and/or equipment idling. Importantly, the actions and strategies suggested in the survey are hypothetical and do not represent actual policy recommendations or decisions by HRM Corporate Fleet staff. The actions and strategies listed in the survey fell into five broad categories that were intended to complement the objectives outlined in Table 1 below. More than 50% agreement was considered to show 'majority support' for a given action or strategy in each category.

Table 1 - Categories for potential actions and strategies (left column) HRM could take as next steps in reviewing and updating its 2008 Vehicle Anti-Idling Policy. Percentages in the left column show levels of agreement with the action or strategy listed. Actions or strategies with less than 50% agreement do not appear here, but are listed in the figures for Q13 through Q17 below.

Options for Driver or Operator Feedback	<ul style="list-style-type: none">• Provide me with periodic, confidential feedback on my idling habits and/or fuel consumption (55% agree)• Provide my supervisor/manager with periodic, anonymous feedback on my team's idling habits and/or fuel consumption (52% agree)
Additional Training Options	<ul style="list-style-type: none">• Provide training on tips to reduce idling, e.g., video on intranet, in-person feedback (53% agree)
Better Enforcement Options	<ul style="list-style-type: none">• Apply the Policy seasonally to avoid temperature extremes (51% agree)• Enforce the Policy using data collected from vehicle/equipment monitoring systems, where installed (54% agree)
Options for Transportation Alternatives	<ul style="list-style-type: none">• Promote carpooling and ride-sharing for employees using municipal vehicles to perform their duties, where appropriate (57% agree)

Figures A through E below show potential corporate actions and strategies that received high to very high levels of agreement among respondents to the employee survey on the 2008 Vehicle Anti-Idling Policy. The actions and strategies are each grouped into one of the 5 categories below.

1. Options for Driver or Operator Feedback
2. Additional Training Options
3. Better Enforcement Options
4. Options to Use Different Vehicles and/or Equipment
5. Options for Transportation Alternatives

The survey responses have been broken down by respondents' frequency of municipal vehicle and/or equipment use to show level of agreement based on how much exposure respondents could have to a particular action or strategy if adopted. Two strategies showed very high levels of agreement, particularly among "essential" vehicle/equipment users: "List relevant examples of how to reduce idling in an attachment to the Policy, tailored to each BU's day-to-day operations" (74% agreement; figure C); and, "Provide better access to more fuel-efficient vehicles and equipment" (70% agreement; figure E).

Figure A – Level of agreement for the strategy “set realistic targets to reduce my idling and/or fuel consumption over time”, in the survey’s ‘Options for Driver or Operator Feedback’ category. Responses are broken down by frequency of vehicle and/or equipment use, from highest (top bar) to lowest (bottom bar) on the left axis.

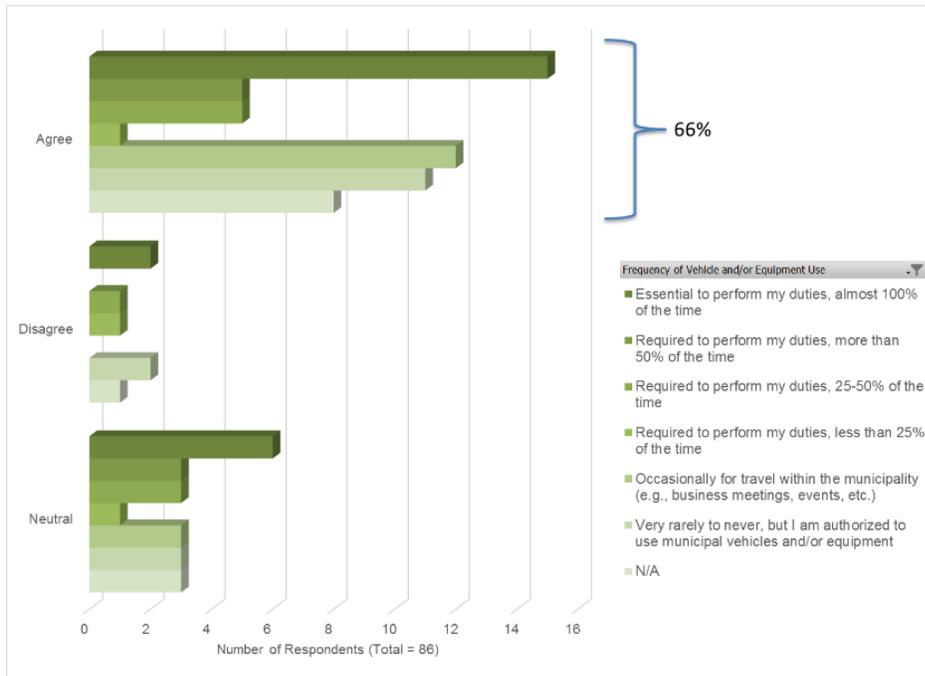


Figure B - Level of agreement for the action “provide periodic, anonymous idling stats for the whole municipal fleet, e.g., via the Employee Hub emails”, in the survey’s ‘Options for Driver or Operator Feedback’ category. Responses are broken down by frequency of vehicle/equipment use, from highest (top bar) to lowest (bottom bar) on the left axis.

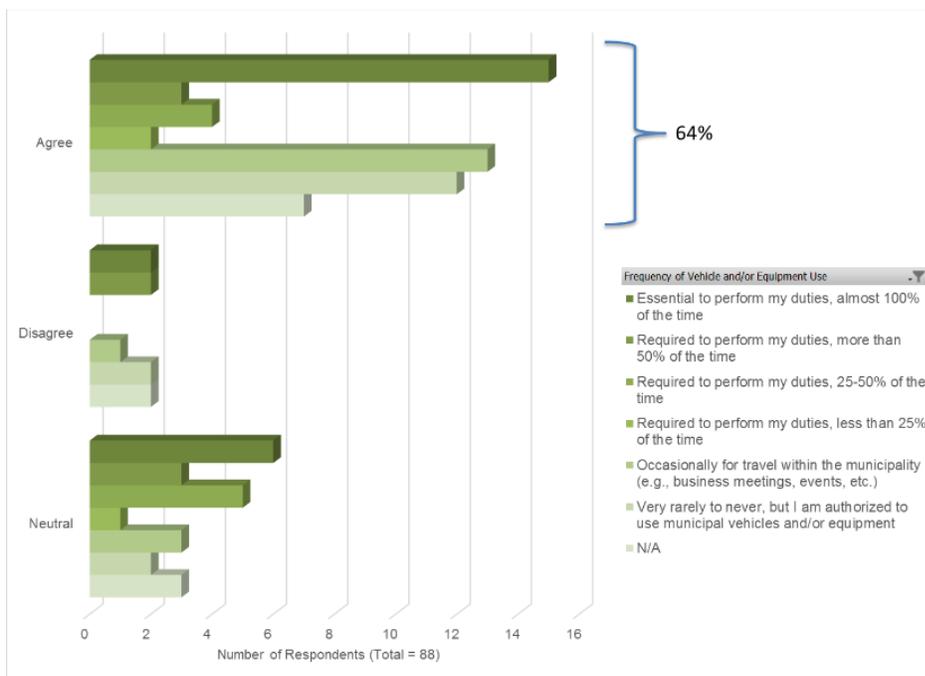


Figure C - Level of agreement for the action “list relevant examples of how to reduce idling in an attachment to the Policy, tailored to each BU’s day-to-day operations”, in the survey’s ‘Additional Training Options’ category. Responses are broken down by frequency of vehicle/equipment use, from highest (top bar) to lowest (bottom bar) on the left axis.

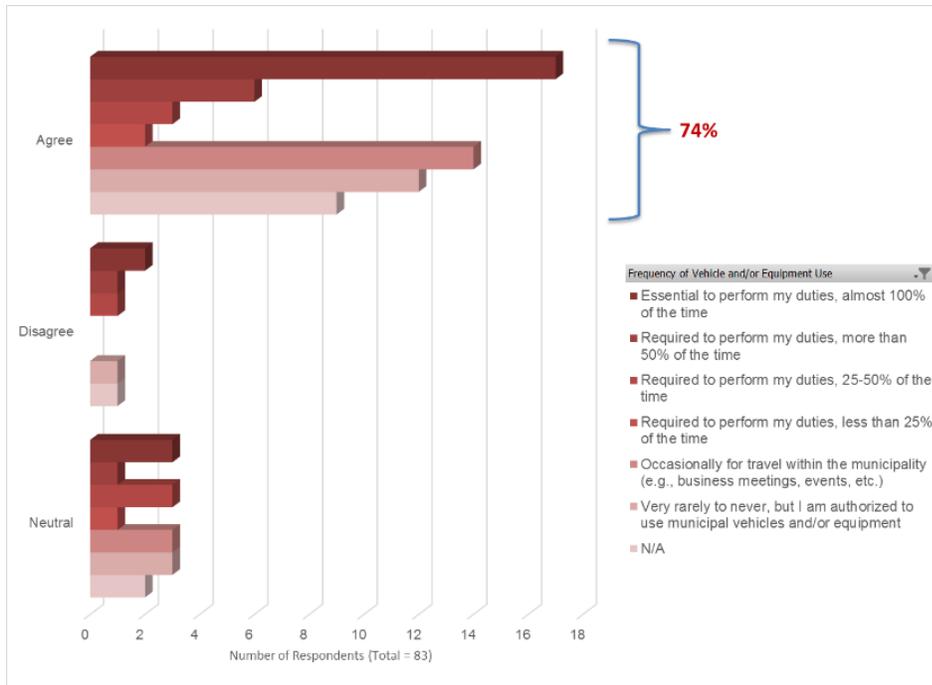


Figure D - Level of agreement for the action “scrap the Policy and trust that municipal vehicle/equipment users will limit idling and/or fuel consumption on their own”, in the survey’s ‘Better Enforcement Options’ category. Responses are broken down by frequency of vehicle/equipment use, from highest (top bar) to lowest (bottom bar) on the left axis.

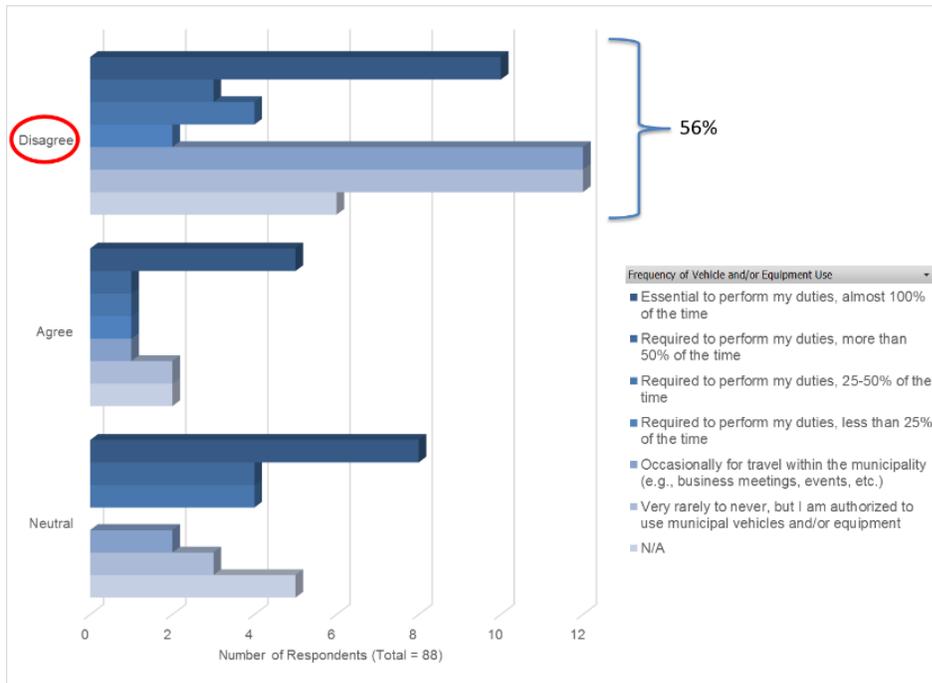
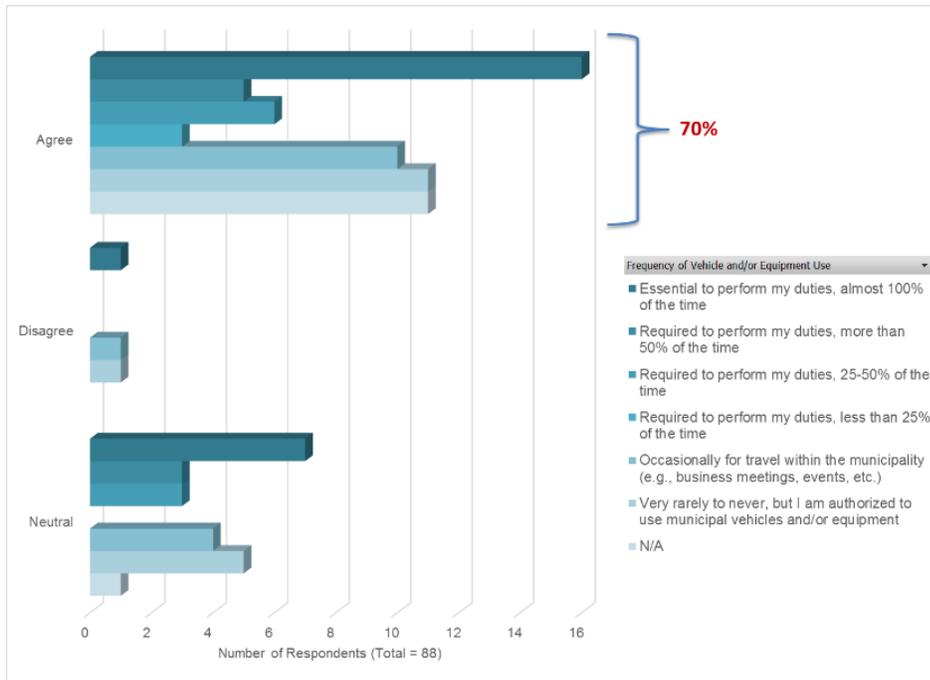


Figure E - Level of agreement for the strategy “provide better access to more fuel-efficient fleet vehicles and equipment”, in the survey’s ‘Options to Use Different Vehicles and/or Equipment’ category. Responses are broken down by frequency of vehicle/equipment use, from highest (top bar) to lowest (bottom bar) on the left axis.



ATTACHMENT G

Discussion of Limitations and Caveats on the Employee Survey and AVL Data

Limitation	Description
<i>Uncertainty</i>	<p>The survey results have not been assessed for statistical significance. Instead, descriptive statistics are provided based upon the survey data. Responses with more than 50% agreement are assumed to be important indicators but are not “statistically significant”. The survey’s design and distribution (in support of a “homogeneous purposeful sample”) and the number of responses relative to HRM’s workforce preclude and limit the analytical power of most inferential, probability-based statistical tests that could determine statistical significance. Similarly, the survey results may be representative of broader trends among HRM employees, but this is not possible for confirm without a more extensive, randomized survey effort that would require additional time and resources to undertake.</p> <p>Purposeful sampling is a non-probability (or non-random) sampling technique in which the subjects in the sample (i.e., users surveyed) match a predefined characteristic, trait or criterion set by the researcher. Only those subjects with the greatest likelihood of providing valuable information were contacted to complete the survey, which limits the response rate and makes the survey non-random. In that case, it is difficult to generalize the results <i>beyond</i> the group that is surveyed, in part because the sample is not representative of the <i>full</i> population, by design. The minimum size of a homogeneous purposeful sample can be as low as 4 to 12 subjects in some studies¹, suggesting that the response rate for HRM’s survey is good (More than 100 responses, representing about 3% of HRM’s entire workforce). There is currently no way to know how many of HRM’s roughly 3,500 employees have access to fleet vehicles and/or are authorized to drive them.</p> <p>The employee survey explicitly included questions that would allow responses to be filtered, or stratified, prior to analysis. This method can ensure the researcher is: i) using the most accurate sample data to answer a specific research question about a specific group; ii) ‘controlling for’ confounding factors such as awareness of a policy; and, iii) improving the credibility of a study by safeguarding the quality of the analysis².</p>
<i>Design</i>	<p>The survey was voluntary, was distributed to the employees most directly affected by the Policy via their managers/supervisors. The survey also took longer than 5 minutes to complete. Those factors directly limit the response rate of any survey. A completely randomized survey design would have to be issued to all staff with @halifax.ca email addresses, would require much more coordination, and would allow for probability-based statistical tests to be performed on the data. However, there would invariably be less valuable information provided regarding vehicle users’ interactions with the 2008 Policy because fewer of the respondents would be vehicle users. Such an approach would be necessary to assess trends relative to all HRM employees’ interactions with the 2008 Policy.</p>
<i>Audience</i>	<p>The employee survey’s design and distribution supported a “homogeneous purposive sample”, a form of non-probability sampling in which a sample of a population is selected based on its characteristics and the objective of the study. In this case, that</p>

¹ Non-probability sampling <https://research-methodology.net/sampling-in-primary-data-collection/non-probability-sampling/>

² This claim appears in a number of seminal works on qualitative research methods, including Patton, M. Q. (2002). Qualitative research and evaluation methods (3rd ed.). Thousand Oaks, CA: Sage, referenced in <https://pdfs.semanticscholar.org/e287/d5579e587325ebaf789834124c4f94969de4.pdf>.

was employees most affected by the 2008 Policy, i.e., those for whom a vehicle is often to always essential to the performance of their duties. However, at least some of those employees may have had less opportunity and ability to respond given the amount of working time they spend operating a vehicle each day. That is especially true for Transit bus operators, even more so because they do not currently have 'halifax.ca' email addresses. The vehicle AVL data can provide insight on driving behaviours of those employees (based on vehicle number and assigned driver data in the database), but that was outside the scope of this report.

<i>Scope</i>	The survey addresses idling related to fleet vehicles <i>and</i> HRM equipment, but the results cannot be corroborated with existing AVL data because they do not include any non-vehicular equipment, e.g., lawn mowers. More work will be required to understand how much unnecessary idling those units commit, and how their fuel consumption can be effectively tracked.
<i>Questions</i>	<p>The survey did not directly ask if respondents felt the 2008 Policy had influenced their idling behaviour. Staff opted against this question <i>before issuing the survey</i> because it a) could be answered through other questions that provide additional valuable data; b) could unnecessarily disqualify respondents not aware of or affected by the Policy; and/or, c) could negatively influence respondents' perceptions of the survey. Whatever the case, such a question is valid and could have provided another useful means of filtering the survey responses.</p> <p>Another valuable question to help filter/stratify the survey responses would be whether a respondent: a) holds a managerial/supervisory role at HRM; b) belongs to an employee union at HRM; or c) prefers not to say. This would help to address the above point and could help to place the responses in greater context.</p>
<i>Training</i>	The survey did not ask respondents to list the period of time they have been exposed to the 2008 Policy, or to rank their existing level of training on anti-idling practices.
<i>Response</i>	The survey was distributed to employees in all BUs and the response rates varied. Two BUs, Halifax Transit and HRP, comprised 17% of the total employee response but do not fall under HRM's corporate fleet AVL system. This prevents staff from complementing their responses with direct vehicle monitoring data.