Regional District of Central Okanagan

Idling Reduction Behavioural Insights

December 2023

Table of Contents

Introduction

The Regional Air Quality Program is a joint initiative of the Regional District of Central Okanagan (RDCO), City of Kelowna, City of West Kelowna, District of Peachland, the District of Lake Country and Westbank First Nation. It is guided by the *Clean Air Strategy* (2015), which defined visions, goals, strategies, and actions. The main vision for this work is, "***clean and healthy air for current and future generations***".

There are several programs that operate under the *Clean Air Strategy*, one of which includes a **Vehicle Idling Prevention** program.

The Air Quality Program brings awareness to unnecessary idling as one way to tackle greenhouse gas (GHG) emissions and improve local air quality and the health of residents in the region.

What is idling?

Vehicle idling occurs when a vehicle is in operation but not in motion. The Environmental Protection Agency estimates that an idling vehicle produces about 1.18 grams of carbon monoxide per minute while idling. This means one minute of idling produces more carbon monoxide than the smoke (CO) from 2.4 packs of cigarettes (Chemistry and Toxicology of Cigarette Smoke and Biomarkers of Exposure and Harm).

Natural Resources Canada states that idling for more than 10 seconds uses more fuel and produces more CO2 than restarting the engine. However, to balance factors like fuel savings, emissions and component wear, 60 seconds is the recommended interval.

Vehicle emissions are a major contributor to air pollution in our region. Studies have shown that it is the most important environmental contributor to poor health and premature death. Reducing harmful emissions helps to improve our air quality and reduces health issues related to air pollution.

The Regional Air Quality Program helps to protect and improve the region's air through education, awareness and pollution prevention programs covering all municipal partners and Electoral Areas in the Central Okanagan.

What can we do to reduce unnecessary idling?

There are several strategies that local governments can take to encourage drivers to reduce unnecessary idling behaviours or change attitudes and awareness in relation to idling. This may include a policy lever, such as the one-minute idling control bylaw introduced by the City of Kelowna on July 25, 2022. It may also include the creation and dissemination of idling awareness educational materials and information to increase awareness and eventual behaviour change.

While educational campaigns offer a promising mechanism to change idling thoughts and habits, it's often difficult to assess the impact of awareness campaigns to understand whether their dissemination played a role in behaviour change.

Through this work, the City of Kelowna, on behalf of the RDCO is exploring an empirical approach to understanding whether idling awareness educational materials can encourage idlers to switch off their ignition or change their thoughts around idling.

Purpose of this pilot study: To use an empirical approach using a behavioral insights lens determine whether an idling awareness campaign can encourage Okanagan residents to change their idling behaviour or sentiments towards idling.

Behavioural insights

Behavioural insights (BI) is an emerging field that uses principles from the behavioural and decision sciences (including psychology and economics) to encourage decisions that promote heath, wellness, and happiness. By accounting for the ways that people make decisions and behave in the real world, BI improves programs, policies, and products in ways that encourage positive changes in consumers, citizens, and employees[1].

Value of behavioural insights

Behavioural insights is the application of an empirical approach to understanding and then modifying human behaviour – all for good – and without restricting freedom of choice. A BI approach embraces the concept of a "choice architect" and helps people make decisions that they were likely to make in the first place. These "nudges" should benefit the decision maker and improve health, wealth and happiness, in the eye of the decision maker. They may also improve the health, wealth and happiness of the wider population.

Value of experimentation

Using an empirical or scientific approach to understand and then change behaviour means to make a conceited effort to monitor and measure whether an "intervention" or "treatment" is successful. A methodology based on sound principles can help provide greater confidence that the intervention may apply to the larger population. While this type of approach may appear unnecessary, the cost of not testing or guessing and not measuring can cost more in the long run and have limited impact on the target behaviour change.

---

[1] *UBC Sauder School of Business* *https://continuingstudies.sauder.ubc.ca/behavioural-insights#:~:text=By%20accounting%20for%20the%20ways,the%20public%20and%20private%20sectors*.

Why this challenge is a fit for a BI approach

This pilot project provides an opportunity to better understand the motivations around the behaviour of unnecessary idling in the Okanagan, and then testing an approach to determine if a certain “treatment” can play a role in changing idling behaviour change. This project is ideal as the target behaviour change (reducing unnecessary idling) positively impacts the health of community and environment. If the intervention is successful, there are opportunities to be scaled to a wider audience) knowing that efforts will make a difference rather than guessing.

Scope-RIDE-scale model

There are several key components to a behavioural insights project. They include:

1

Scoping: The scoping phase seeks to outline the problem at hand and identifies the targeted behaviour change. A high-level understanding of the audience, the likely barriers, whether the population of interest can be reached, and whether the behaviour can be measured, will set the project up for success. This bird’s eye view of the project will help to determine if the project is a good fit for a BI intervention.

2

Research: Exploratory secondary research conducted through literature reviews, cross-jurisdictional scans, or qualitative research with the target population, for example, will help to dig into the problem, how it flows, deep dive into barriers, and understand the “how” behind reaching the population and target audience. This phase provides a more comprehensive understanding to the problem and target behaviour change.

3

Innovation: This stage builds off what was learned through the research phase and outlines the study methodology. This work will identify the “treatment” or “nudge,” the target audience, how this audience will be reached, the location, how the target behaviour will be measured, what messaging will be used, and more.

4

Data Collection: In this stage, the methodology is implemented, the BI intervention is trialled, and data is collected.

5

Evaluation: At the conclusion of the experiment, results are interpreted, analysed, and sometimes visualized to understand if the intervention (an idling awareness campaign) impacted behaviour or sentiment.

6

Scale: BI projects serve as rigorous pilot projects, with the idea of rolling out something larger with a larger population. This phase looks at that larger roll-out if the intervention is successful at changing the target behaviour.

Applying a BI lens: It should be noted that the emerging field of behavioural insights typically applies a rigorous scientific approach to understanding and then modifying human behaviour. While this study uses foundational elements of BI, best practices in BI methodology design were unable to be applied due to time and budget considerations. As a result, this work should be seen as using a "BI Lens" as a first step in understanding behaviours and sentiments on unnecessary idling.

Scoping

The scoping phase seeks to outline the problem at hand and identifies the targeted behaviour change. A high-level understanding of the audience, the likely barriers, whether the population of interest can be reached, and whether the behaviour can be measured, will set the project up for success. This bird's eye view of the project will help to determine if the project is a good fit for a BI intervention.

Problem Statement

Transportation is the largest contributor to greenhouse gas (GHG) emissions within the City of Kelowna. Vehicle emissions also directly contribute harmful emissions into the city's air supply. Idling control is an action to reduce GHG emissions and improve air quality from the transportation sector, which has also been outlined in policy documents such as Kelowna's Community Climate Action Plan and the Central Okanagan Clean Air Strategy. Idling creates smog that can seriously affect residents' health. Benefits of reducing air pollution can be measured by the prevention of premature deaths. Improving the conditions for pedestrians and bicyclists in areas where idling frequently occurs is an important consideration for the overall health of the community.

Target behaviours

- Reduce unnecessary vehicle idling while in the act of dropping off or picking up.
- Change in sentiments toward idling.

Barriers to performing target behaviour

- Idling is a deeply engrained behaviour

- Idling is often done for convenience or comfort, which gets prioritized over the attributed negative environmental impacts, long-term health impacts, or curbing behaviour for the greater good, rather than for the self
- Misconceptions or misinformation about how turning a car off and on wastes fuel, etc.

Research

Exploratory secondary research conducted through literature reviews, cross-jurisdictional scans, or qualitative research with the target population, for example, will help to dig into the problem, how it flows, deep dive into barriers, and understand the "how" behind reaching the population and target audience. This phase provides a more comprehensive understanding to the problem and target behaviour change.

Background research was used to help design the methodology for this pilot project. These activities helped to answer the following:

- What audience will we target?
- How and where will we reach them?
- What treatment will we use?
- How will we measure a change in behaviour?
- What do we know about the behaviour we are trying to target?
- What kind of messaging resonates?

Background research

A summary of key points found through desktop research has been outlined below[2]:

Table 1. Summary of background research that provided insights into methodology design

Who idles?	Where do people idle?	Why do they ide?

• The amount of idling a driver does tends to increase with the number of people in the household.
• A driver living with children is more likely to idle than one without children.
• The frequency of idling appears to decrease as a person ages—a retiree is less likely to idle.
• A person living in a rural area is more likely to idle than a person living in an urban centre.
	• Idling occurs in many places including roadways, truck stops and rest areas, bus terminals, restaurant drive-throughs, tourist attractions, landfill and ferry lineups, car washes, company terminals or distribution centres, and school's zones.	• Warming up or cooling down is the most common reason given for idling.
		• Other reasons include:
		  ○ waiting for passengers
		  ○ waiting to refuel or to have their car washed
		  ○ stopping at railway crossings
		  ○ stopping to talk to an acquaintance or friend
		  ○ waiting to park
		  ○ preparing to leave the house
		  ○ running quick errands
		  ○ sitting in drive-through lanes

Literature review

The following studies were reviewed to help shape the overall methodology of the work:

Surveillance or self-surveillance? Behavioral cues can increase the rate of drivers' pro-environmental behavior at a long wait stop. (2017) | Access article

This study was conducted in Canterbury in Kent, United Kingdom at a busy level crossing (train crossing when the barriers are down). Results showed that images of "watching eyes" had no impact, but messages that combined clear instructions with a private self-focusing cue were effective, doubling the rate of pro-environmental behavior.

Method of observation: The outcome was measured discreetly by viewing exhaust activity and listening for engine noise emitted from each vehicle.

[2] *Why do Canadians idle?* https://www.nrcan.gc.ca/energy/efficiency/communities-infrastructure/transportation/idling/4427

Reducing car idling at primary schools: An intervention study of parent behaviour change in Perth, Western Australia (2020) | Access article

A low-intensity 4-week anti-idling intervention was developed comprised of onsite signage, four newsletters, and two fact sheets. The study results showed that a low-intensity behavioural intervention can be an effective strategy to affect parents' attitude towards vehicle idling. This was demonstrated by the reduced number of idling vehicles observed in 8 of the 10 intervention schools and decreased overall particulate matter concentration after the anti-idling intervention.

Motivating the selfish to stop idling: Self-interest cues can improve environmentally relevant driver behaviour (2018) | Access Link

The current paper draws on evolutionary models of environmental behaviour to test whether appeals to self-interest can encourage drivers to turn off their engines at long wait stops. Using an experimental design, drivers were shown one of three self-interest appeals (financial, health, kin) while waiting at a congested level-crossing site in the UK. Results showed that all three self-interest appeals increased the chances of drivers turning off their engines compared to the control condition. Specifically, drivers were approximately twice as likely to turn off their engines in the self-interest conditions (39–41% compliance) compared to drivers in the control condition (22% compliance). Thus, self-interest motives can be effective for promoting pro-environmental behavioural compliance.

Intervention messages:

- **Financial:** You throw away your money by leaving your engine on when the barriers are down.
- **Health**: Warning – pollution: When barriers are down close vehicle windows.
- **Kin**: Think of the children. When barriers are down switch off your engine.

Method of observation: While the barrier was down and the vehicles were stationary, a single research assistant walked along the sidewalk from the barrier as far as the sign recording whether each vehicle's engine was on or off. The outcome variable (whether the vehicle's engine was on or off) was measured discreetly by viewing exhaust activity and listening for engine noise emitted from each vehicle.

Psychological interventions can reduce engine idling and improve air quality (2021) | Access article

A team of psychologists found that using carefully worded road signage can decrease the number of drivers leaving engines idling during queues at crossing barriers. The researchers

tested the effects of three intervention signs fixed to lampposts, which amplified existing signs to request drivers to switch off their engines. These were:

- 'Join other responsible drivers in Canterbury. Turn off your engine when the barriers are down' (Social norm messaging).
- 'Turn off your engine when the barriers are down. You will improve air quality in the area' (Outcome efficacy messaging).
- 'Think about your actions. When the barriers are down, please turn off your engine' (Self-regulation messaging).

The social norm and outcome efficacy messages successfully increased the proportion of drivers who turned off their engines by 42% and 25%, respectively.

The presence of larger numbers of other drivers boosted the impact of the social norm road signage. These findings demonstrate that drivers may feel a stronger urge to conform to the norm of turning their engines off when those ahead of them in traffic do too. This reduces harmful emissions when it is most urgent to do so.

Fostering Behaviour Change – The Power of Commitments (2021) | Access Link

Idling frequently occurs when parents and guardians wait to pick a child up at the end of the school day. Idling is also common at Toronto's aptly named "Kiss and Ride" parking lots when partners wait at the end of the workday for a partner to return on a train from downtown Toronto. Baseline observations indicated that motorists in these two locations were idling their engines 53% of the time.

Two strategies to reduce engine idling were pilot-tested. In the first strategy, a minimum of four signs in various locations were placed at the schools and Kiss and Ride parking lots. This is because barrier and benefit research revealed that the number one reason why Canadians idle is that they forget to turn off their engines. The signs were attached to concrete bases and were lower than most signs to increase the probability that they would be seen. By themselves, the signs did not affect engine idling.

Concurrent with the first strategy, a second strategy was tested in which the signs were used in conjunction with personal contact, prompts, and commitments. The following script was used for these conversations:

"Good afternoon/evening. My name is _____, and I am working with the City of Toronto on a project aimed at reducing vehicle engine idling. We want to decrease the harmful emissions that occur when vehicle engines are left running. These emissions, as you may know, decrease air quality and contribute to climate change. We are asking motorists to commit to turning off their engines when they are parked and waiting in their vehicles. Would you be willing

to join the growing number of people who have made a similar pledge and agree to turn off your vehicle's engine when you are parked and waiting in your vehicle? We are asking those who pledge to turn off their vehicle engine to place this sticker on their window. This sticker will both serve as a reminder to turn your engine off and as a display of your commitment to reducing engine idling. We designed the sticker so that you can easily remove it from your window at a later time. Would you be willing to attach this sticker to your window? We are also giving out these information cards which explain how turning off your engine can save you money, help you breathe easier, and spare the air. Would you like to have one?"

While the signs by themselves did not reduce engine idling, the frequency of engine idling was reduced by 32% and idling duration by 73% when combined with personal contact and commitments. These remarkable reductions occurred even though each conversation lasted only about a minute per motorist.

Anti-idling campaign reduces idling time at elementary schools (2022) | Access Link

For this study, they used the U.S. Environmental Protection Agency's Idle-Free Schools Toolkit to conduct an intensive three-month anti-idling campaign involving teachers and parents at two elementary schools in Utah. The researchers found 38% less idling time and 11% fewer cars idling after the campaign than before. The researchers intended to follow up several months later to see how well the effects of the campaign persisted, but unfortunately, school closures due to the COVID-19 pandemic abruptly ended the study in March 2020.

Method of observation: U scientists have developed mobile tools to monitor air quality, including a van filled with research-grade air sensors. For this study, the van was parked outside the schools for a week at a time in each school's pick-up/drop-off zone. The measurements at the van were then compared with air quality measurements inside the school and near the school's playground.

Idle-Free Schools Toolkit for a Healthy School Environment | Access Link

The Idle-Free Schools Toolkit includes information needed to run an effective idling reduction campaign at a school to reduce student exposure to toxic vehicle exhaust.

Method of observation: Split into zones in which one observer can easily track all the vehicles in that area (e.g., all vehicles on one side of the street in one block; all vehicles on both sides of the street on a small block; all vehicles in the school's traffic circle; all vehicles in one section of the school's parking lot, etc.)

Message Framing to Reduce Automobile Idling (2018) | Access Link

This work incorporates Regulatory Focus Theory, a social-psychological framework which differentiates between promotion- and prevention-focused individuals. Furthermore, messages are framed with respect to idling-relevant concerns that participants identify — finance, health, or the environment.

Participants were asked to express behavioral intention and engagement in response to messages tailored for their regulatory focus and domain of concern. Results revealed that 1) participants prioritized finance and health much more often than the environment; 2) most participant categories responded well to their targeted messages; 3) Promotion/Finance participants seemed especially challenging to motivate, but modifications to their targeted messages led to improved results.

Innovation

This stage builds off what was learned through the research phase and outlines the study methodology.[3] This work will identify the "treatment" or "nudge," the target audience, how this audience will be reached, the location, how the target behaviour will be measured, what messaging will be used, and more.

Target audience

Gathering participants: The background research helped to shape the target audience. In addition, there were pre-established relationships between the regional air quality coordinator for the RDCO and the elementary schools involved in this work.

- Elementary-aged students from Springvalley Elementary School and Quigley Elementary School in School District 23
- Parents or guardians of elementary-aged students
- Teachers, administrators, support staff

[3] *Best practice in this field is to use a randomized controlled trial (RCT). This research technique aims to gather a target population that is as close to the real-world as possible and helps us make sound recommendations. It should be noted that for this project, an RCT is likely not feasible due to budget constraints.*

Treatment & control

Control: Baseline idling observations and idling habits and sentiments survey

Treatment: Delivery of idling awareness assets part of an idling awareness campaign. More details on the campaign materials can be found in **Appendix A**.

Idling awareness assets part of the idling awareness campaign:

- Don't Sit Idly By Sticker
- Switch Off Your Ignition Idling Decal
- Pollution Pit Stop Info Card
- Idling Postcards RDCO & City of Kelowna (2)
- Outdoor Vinyl Banners
- Online StoryMap (website)
- Pollution Pit Stop Video

Location

This pilot study took place at two schools within School District 23, Springvalley Elementary School, and Quigley Elementary School. Both schools were selected due to existing relationships between the regional air quality coordinator and the school administrators through the Safe Travel Planning work conducted in 2023.

Measurement

To determine if there is a change in behaviour or attitude as a result of an idling awareness campaign, the following items were used as direct measures or proxies of behaviour change:

Quantitative: Idling observations

- Visual idling observations at select locations before and after the delivery of an idling awareness campaign over three days in the fall 2023

Qualitative: Idling sentiments survey

- Idling habits, sentiment and awareness survey delivered to school communities before (Part A) and after (Part B) the campaign
- Surveys were circulated to the school community by the school administration; reminders were sent to school contacts to encourage participation
- Further outreach was conducted to PACs for Part B, only
- Paper pamphlets were passed out in the parking lot of Springvalley on one day of measurements for Part B only
- Survey participation was incentivized by entering a draw to win a $50 gift card of their choosing

Pledges: Pledge counts

- Count the number of pledges that result from the idling awareness campaign
- Pledging was incentivized by offering a pizza lunch to the grade at each school with the most pledges

Methodology

- **Pre-Campaign:** In the Fall of 2023, idling vehicles were monitored at either drop-off or pick-up times over three days in a one-week period at two elementary schools within School District 23. During this time, each school administrator was also asked to circulate an online survey to families and the broader school community to understand current habits and attitudes toward idling.
- **The Campaign:** In the following weeks, two idling awareness outdoor vinyl banners were put up in select locations at each school where idling typically occurs. School administrators were also asked to circulate educational materials (Idling Awareness Tool-Kit) to each family at the school.
- **Post-Campaign:** Several weeks after the campaign was delivered, idling observations were conducted once again. During this time, administrators were asked to circulate another short survey to families and the broader school community to understand if habits or attitudes towards idling shifted after receiving idling awareness materials and to determine which messages resonated the most.

Methodology Limitations

With this experimental design, there was no way to isolate the target audience to determine if the treatment impacted idling behaviour or sentiment. This meant that:

- Participants at school pick up or drop off varied each day.
- Respondents who filled out Part A of the survey were not necessarily the same as those who filled out Part B.
- There was no direct linkage between those who received idling materials and those who filled out the survey.

It was thought that if the sample size was large enough, that generalizations could be made about the impact of the treatment on the school community.

An outline of the pilot project schedule and data collection times can be found in **Tables 2** and **3**.

Table 2. Pollution Pit Stop Schedule

	Pre-campaign	Campaign	Post-campaign
Idling Observations	Week of October 16	--	Week of November 20
Delivery Idling Awareness Tool-Kit	--	October 23 to November 17	--
Idling Sentiments and Habits Survey	--	October 23 to November 17	November 20 to December 3

Table 3. Idling observation times at both Quigley and Springvalley Elementary Schools

School	Measurement time
Quigley	AM measurements from 8:00AM – 8:30AM
Springvalley	PM measurements from 2:00PM – 2:30PM

Data Collection

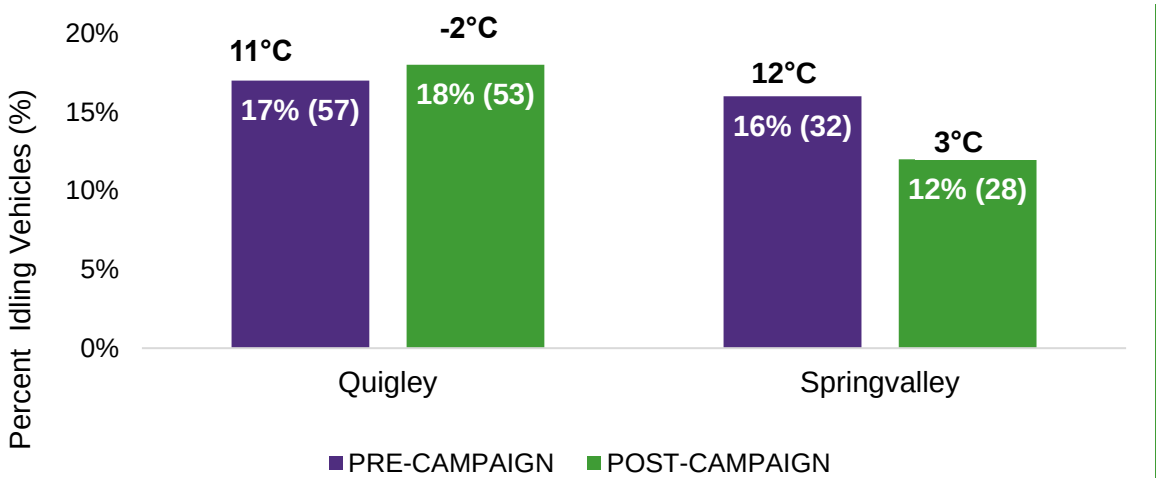
In this stage, the methodology is implemented, the BI intervention is trialled, and data is collected.

Idling observations

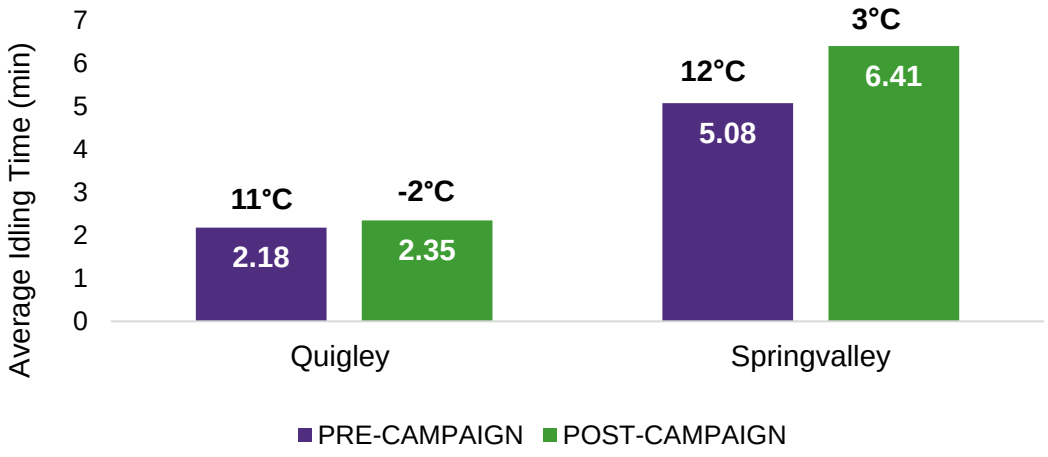
Quigley Sample Size Pre: n = 335
Quigley Sample Size Post: n = 305

Springvalley Sample Size Pre: n = 202
Springvalley Sample Size Post: n = 234

Idling counts



Average idling time



Observations

- For both schools, there were many more non-idling vehicles than idling vehicles.
- At Quigley, the proportion of idling vehicles pre-campaign and post-campaign was relatively the same, with no idling reduction achieved.
- At Springvalley, the proportion of idling vehicles decreased post-campaign by four per cent (4%).
- At Quigley, parents idled slightly more as the temperature decreased (idling time increased only by 17 seconds).
- At Springvalley, parents idle more as the temperature decreases (idling time increased by 1 min and 30 sec).
- At both sites, repeat idling vehicle were observed.
- At Springvalley, a school bus was observed to be idling pre-campaign for up to six minutes over multiple days, but was turned off during the observation days, post-campaign, indicating that some behaviour change was observed.

Idling habits and sentiments survey

Two surveys were administered through this pilot project:

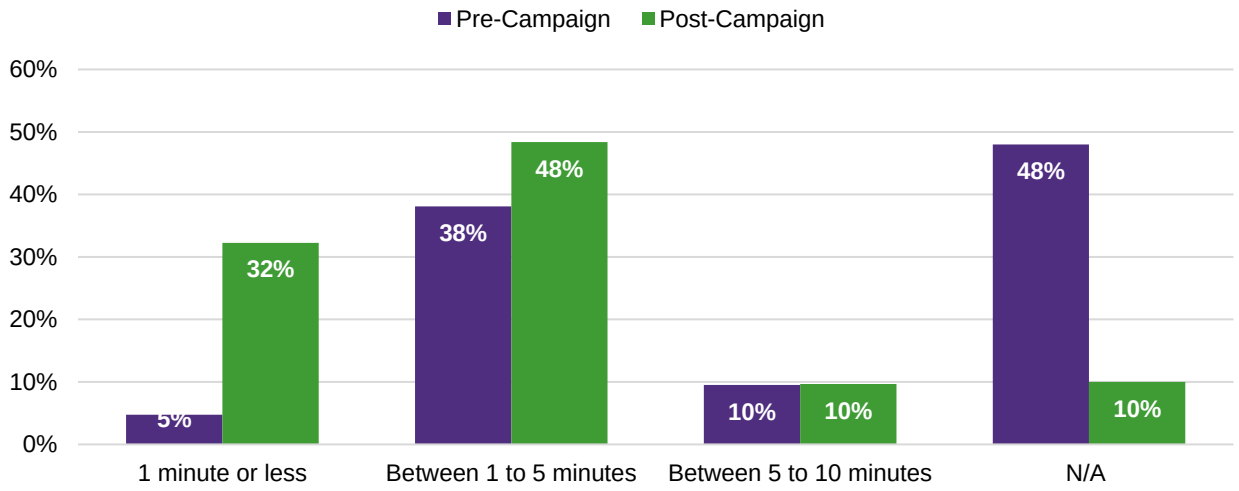
- **Part A: Pre-Campaign** was delivered before the treatment (idling awareness campaign) to understand baseline idling habits, sentiments, and knowledge. It received **21 responses**.
- **Part B: Post-Campaign** was administered after the treatment (idling awareness campaign) to determine if a reported change in behaviour was observed or if sentiments or knowledge changed. It received **31 responses**.

Pre-campaign and post-campaign survey results combined

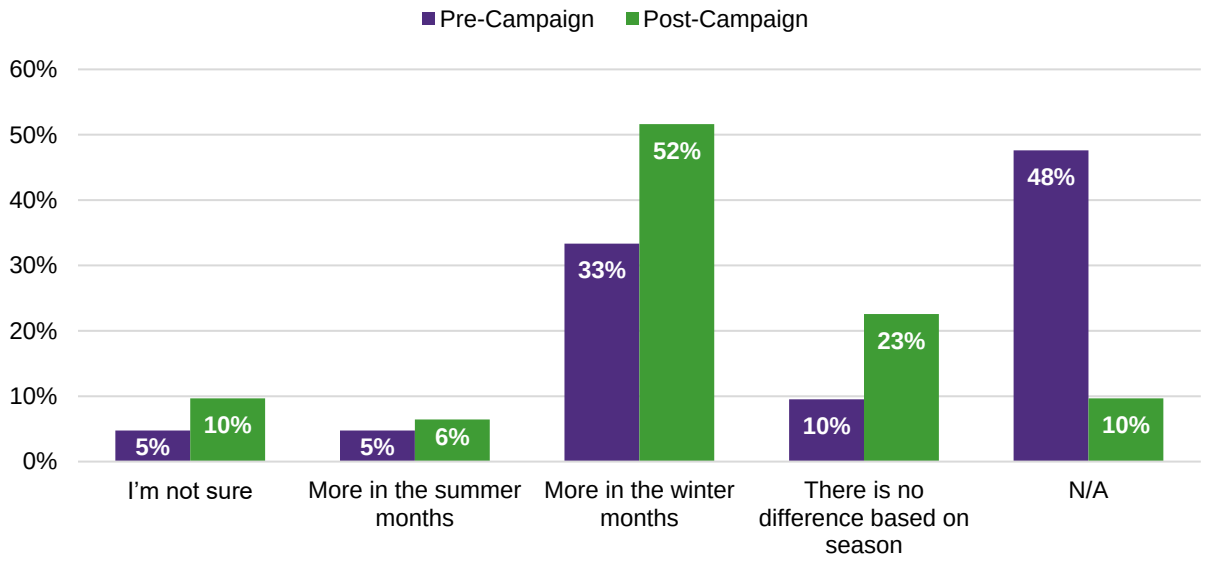
The following results illustrate the pre-campaign and post-campaign results in one combined graph.

Q: On average, how many minutes do you think you idle per day?

The majority in both the pre-campaign and post-campaign idle between **1 to 5 minutes per day**. However, the results reveal that respondents in the post-campaign survey tend to idle less per day than the pre-campaign respondents.



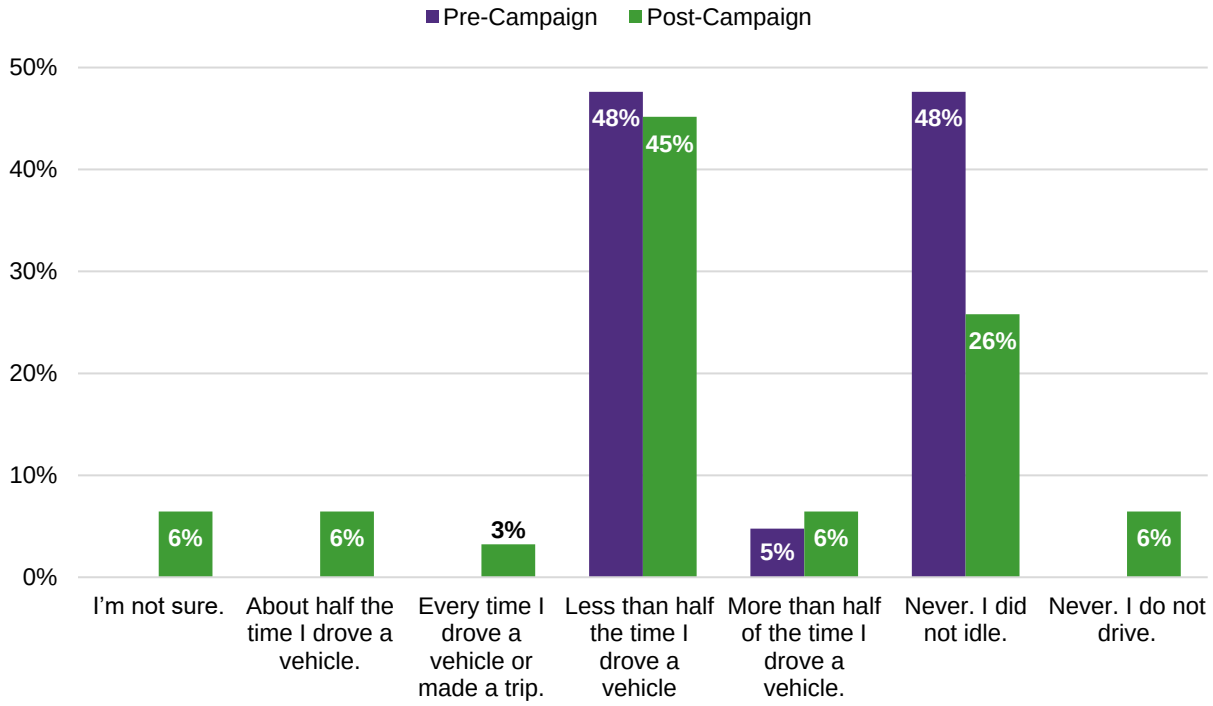
Q: Do you tend to idle:



Q: Consider your idling habits over the last two to three weeks. How frequently did you idle your vehicle? (Pre-Campaign, n = 21) (Post-Campaign, n = 31)

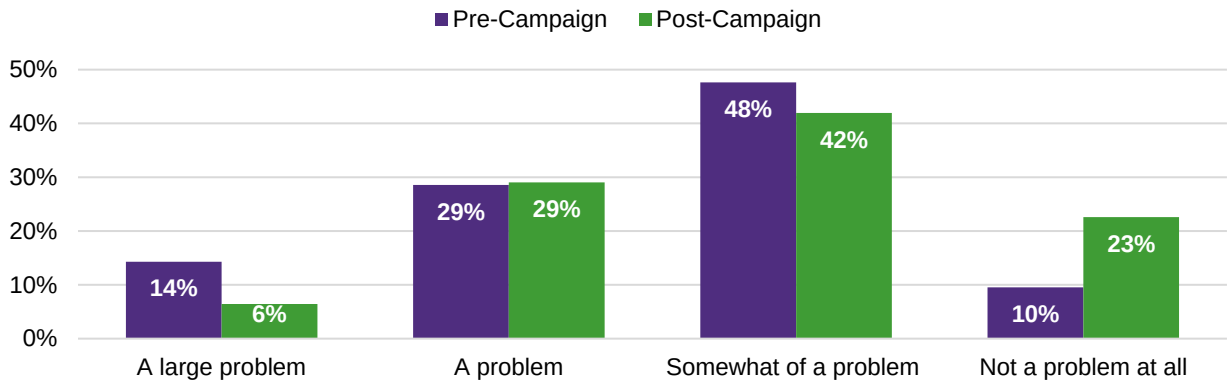
When comparing the results of the pre-campaign survey to the post-campaign survey, it was found that the frequency of vehicle idling slightly increased. While nearly half of the respondents in the pre-campaign (48%) reported that they never idle, only 26% reported the same in the post-campaign.

Additionally, the post-campaign survey showed that 17% of the respondents idled about half the time, more than half the time or every time that they drove a vehicle. This is higher than the pre-campaign, where only 5% of respondents reported idling more than half of the time they drove a vehicle.



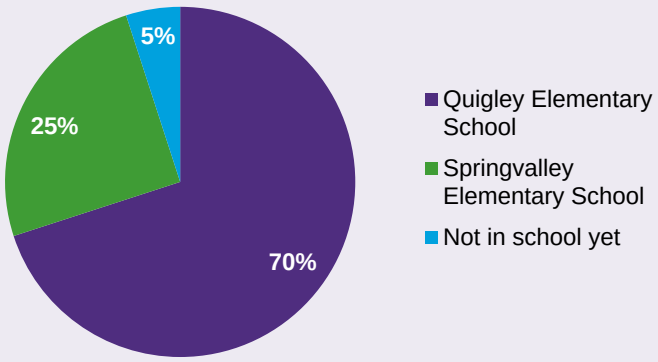
Q: How much of a problem do you think idling is at your child's elementary school? (Pre-Campaign, n = 21) (Post-Campaign, n = 31)

Overall, respondents in the pre-campaign survey were more likely to think that idling is a problem at their child's elementary school. While 43% in the pre-campaign survey responded that idling is a "large problem" or a "problem," only 35% in the post-campaign responded the same.



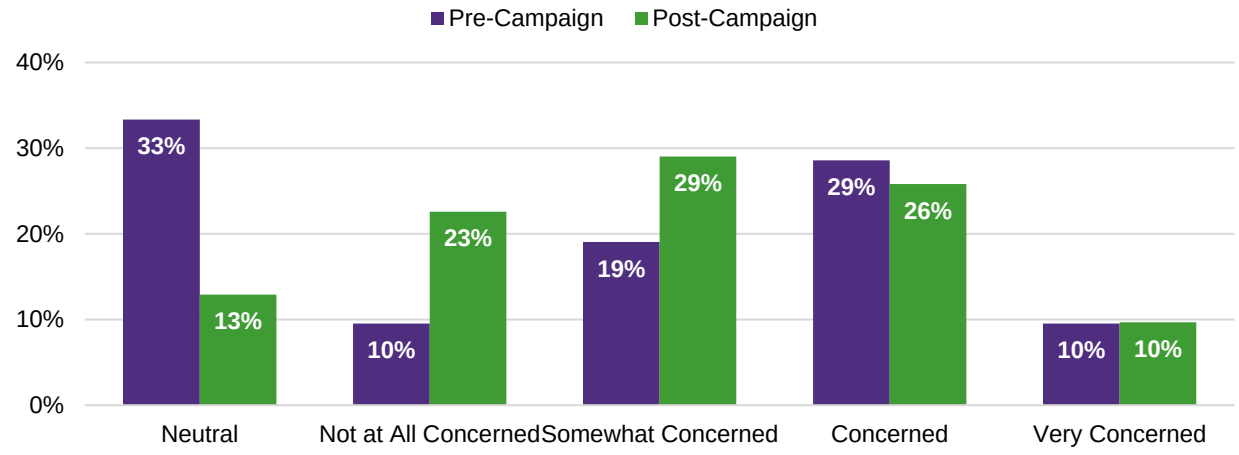
"A large problem" and "A problem" responses by School

Of the total number of pre- and post-campaign survey respondents who indicated that idling is a "large problem" or a "problem" at their child's elementary school, the majority (70%) have children who attend Quigley Elementary School.



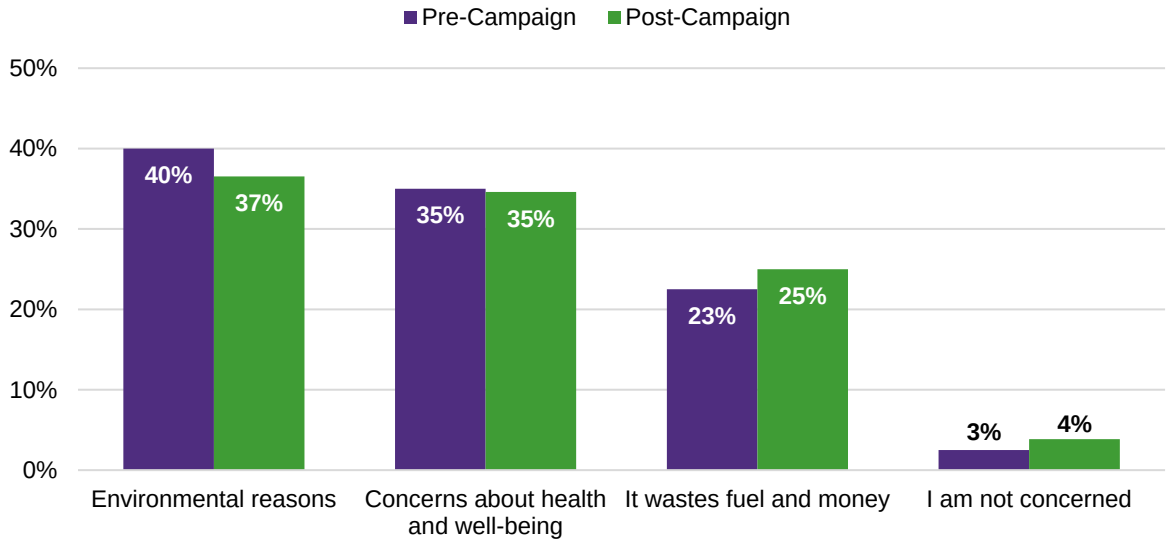
Q: How concerned are you about vehicle idling in your community? (Pre-Campaign, n = 21) (Post-Campaign, n = 31)

Generally, respondents in both the pre-campaign and post-campaign surveys indicated a similar level of concern for vehicle idling in their community, with 39% of respondents in the pre-campaign survey and 36% of respondents in the post-campaign survey expressing that they are "concerned" or "very concerned."



Q: Why are you concerned about idling? Please select all that apply. (Pre-Campaign, n = 21) (Post-Campaign, n = 31)

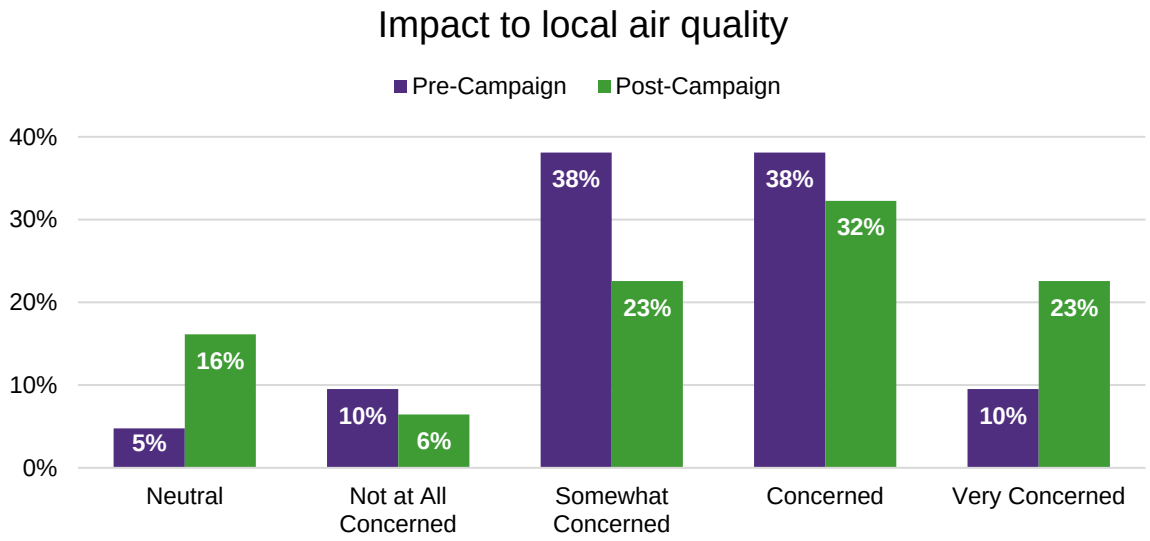
The reasons for concern regarding idling remained relatively consistent between the pre- and post-campaign surveys. Environmental reasons were cited as the greatest concern by both groups, followed by concerns about health and well-being and wasting fuel and money.



Q: How concerned are you about the following impacts of idling? (Pre-Campaign, n = 21) (Post-Campaign, n = 31)

Overall, post-campaign respondents expressed slightly higher concern about the impacts of idling on local air quality, climate change, and the health of themselves or the health of others.

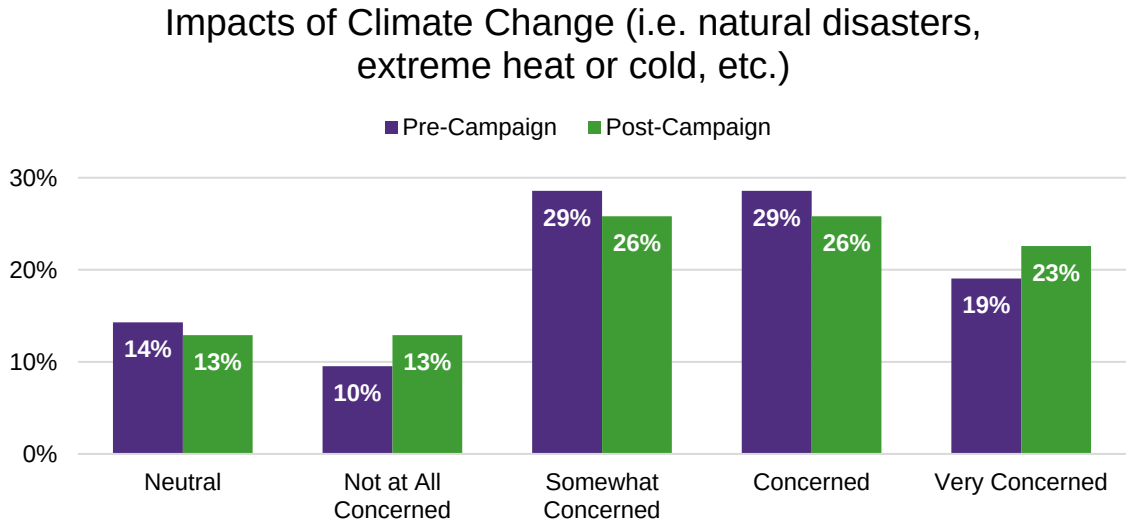
The greatest increase between the pre- and post-campaign groups was seen in the impact to local air quality, with a 7% increase in those who were “concerned or “very concerned.”



Total % of “Concerned” and “Very Concerned”

Pre: 48%
Post: 55%
Ave: 51.5%

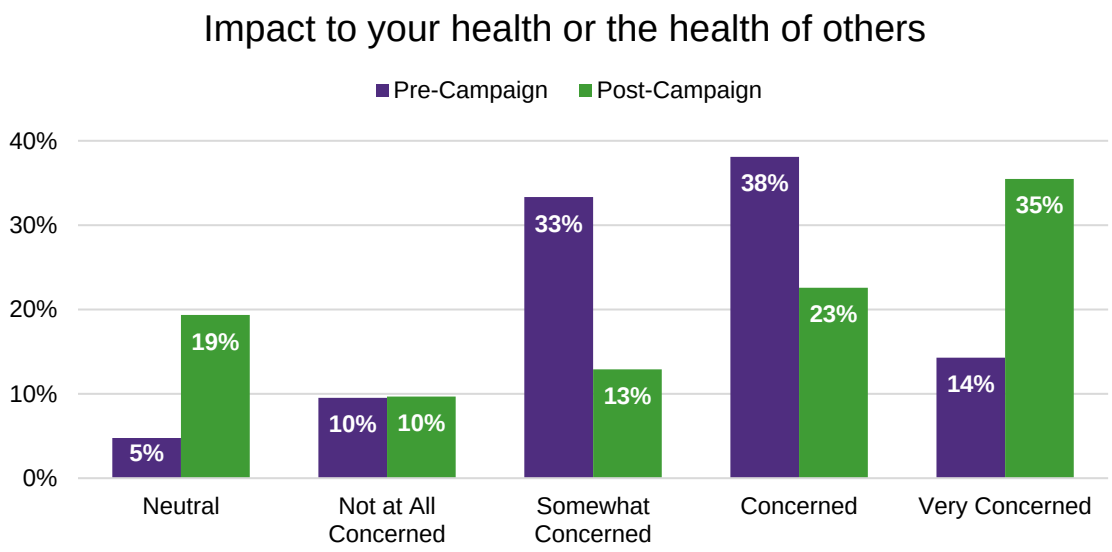
Results reveal a 7% increase in respondents who were "concerned" or "very concerned" from the pre-campaign to the post-campaign survey.



Total % of “Concerned” and “Very Concerned”

Pre: 48%
Post: 49%
Ave: 48.5%

Post-campaign results showed a 1% increase in the respondents who expressed they were "concerned" or "very concerned" about the impacts of climate change.



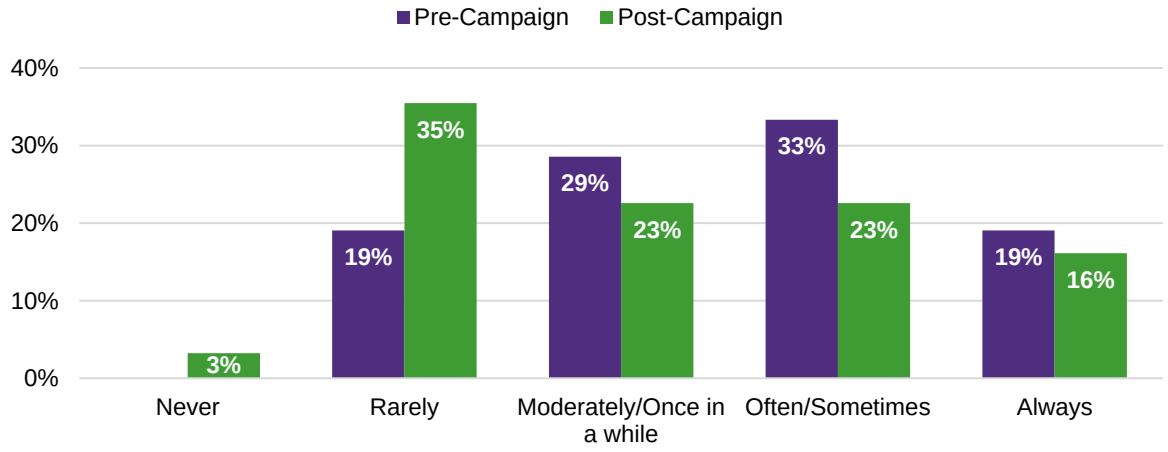
Total % of "Concerned" and "Very Concerned"

Pre: 52%
Post: 58%
Ave: 55%

Six percent (6%) more respondents expressed concern about the impact on their health or the health of others in the post-campaign survey.

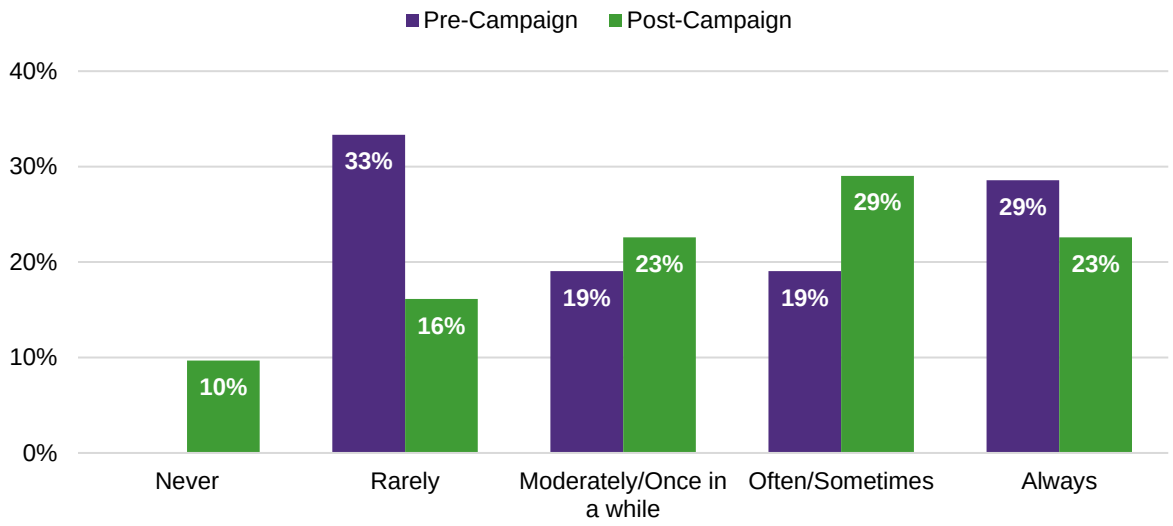
Q: Do you notice when SOMEONE ELSE is unnecessarily idling? (Pre-Campaign, n = 21) (Post-Campaign, n = 31)

Results reveal that pre-campaign respondents were more likely to notice when someone else is unnecessarily idling, with 52% indicating that they "often/sometimes" or "always" notice. This is 13% higher than the post-campaign respondents, where only 39% indicated that they "often/sometimes" or "always" notice.



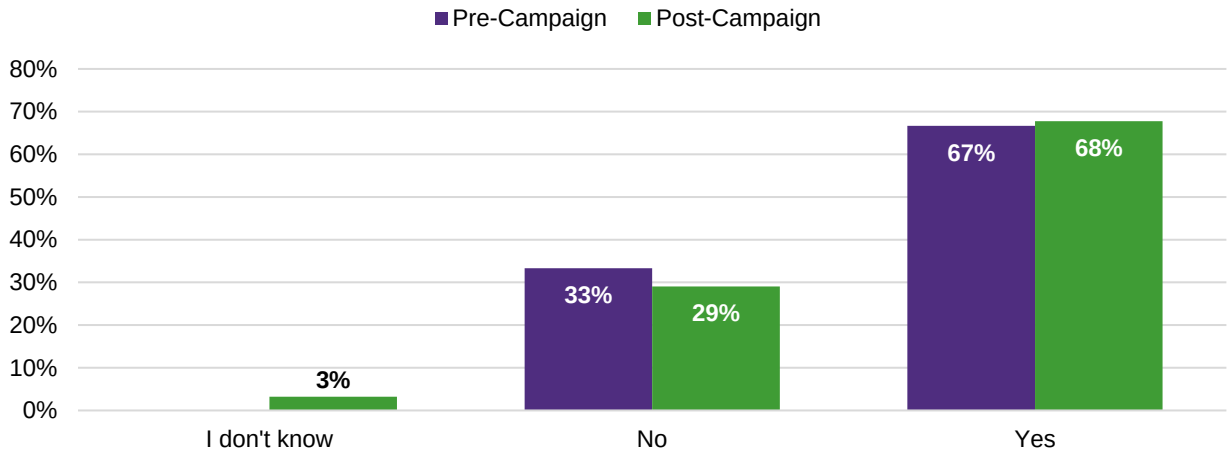
Q: Do you notice when YOU are unnecessarily idling? (Pre-Campaign, n = 21) (Post-Campaign, n = 31)

Overall, respondents were more likely to notice when they were unnecessarily idling in the post-campaign. Fifty-three percent (53%) of respondents in this group indicated that they "often/sometimes" or "always" notice, compared to 48% in the pre-campaign.



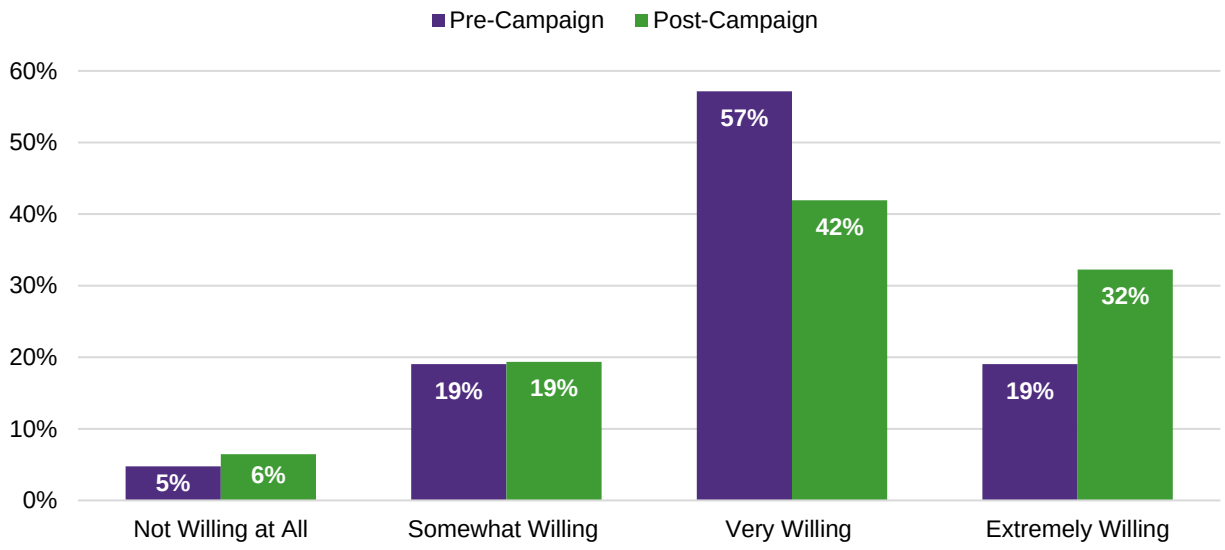
Q: In the last two to three weeks, have you turned off your engine because you noticed that YOU were unnecessarily idling? (Pre-Campaign, n = 21) (Post-Campaign, n = 31)

According to the pre- and post-campaign surveys, most respondents reported that they had turned off their vehicle's engine in the past 2 to 3 weeks to avoid unnecessary idling. However, there was only a slight increase of 1% in the number of post-campaign respondents who reported doing so.



Q: How willing are you to change your idling habits? (Pre-Campaign, n = 21) (Post-Campaign, n = 31)

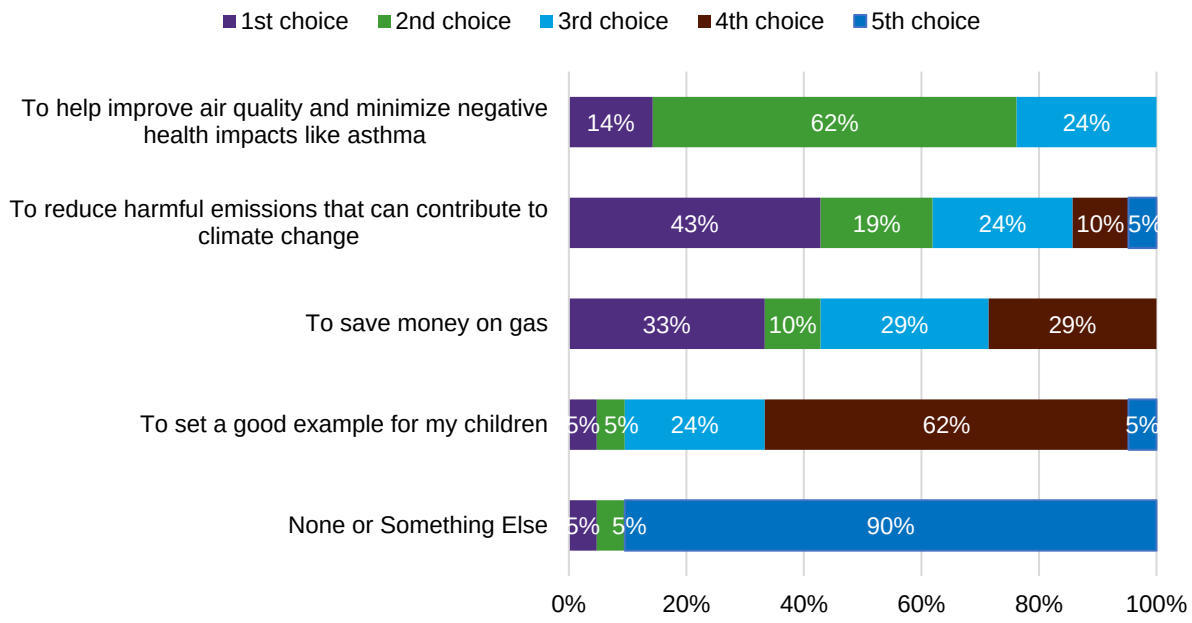
Respondents showed a willingness to change their idling habits in both the pre- and post-campaign surveys. However, the results indicate that in the pre-campaign survey, 76% of the respondents were "very willing" or "extremely willing" to change their idling habits, while in the post-campaign survey, the percentage decreased slightly to 74%.



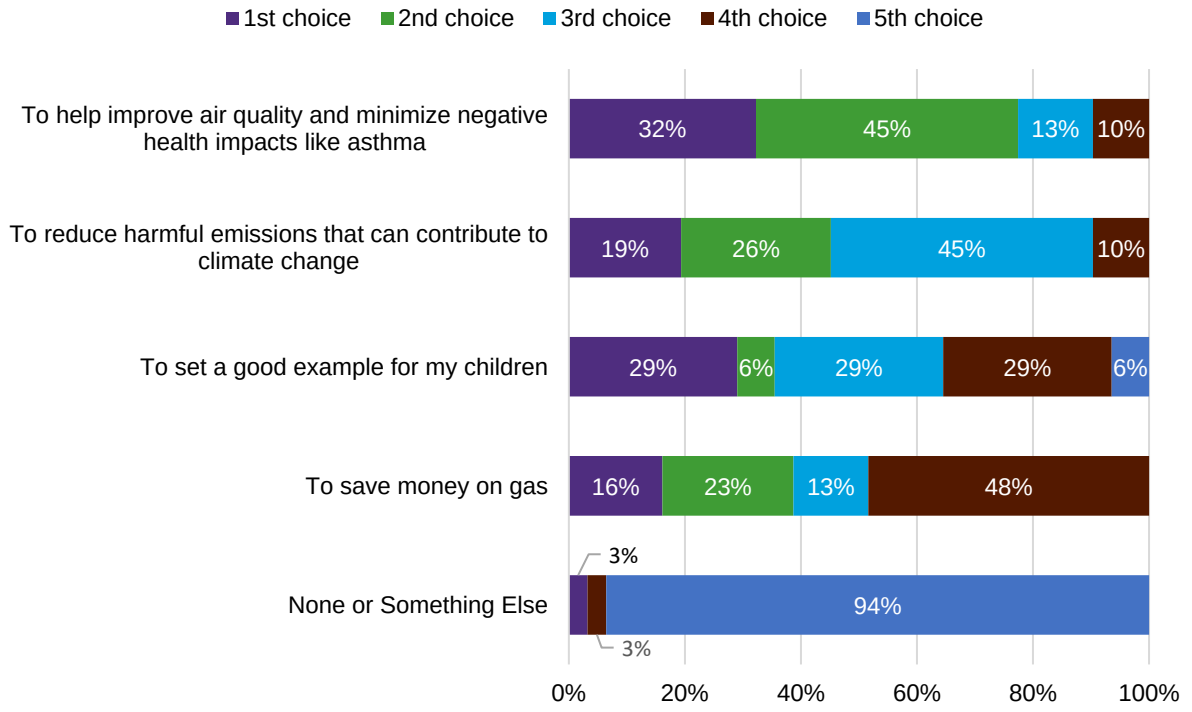
Q: Please rank the following reasons in which you would consider changing your idling habits (1 = most compelling reason; 5 = least compelling reason): (Pre-Campaign, n = 21) (Post-Campaign, n = 31)

In both the pre-campaign and post-campaign surveys, the respondents' motivation to change their idling habits remained similar. The highest-ranked reasons for changing these habits were to improve air quality and reduce harmful emissions that can contribute to climate change. However, “to set a good example for my children" was ranked higher in the post-campaign survey than in the pre-campaign survey.

Pre-Campaign



Post Campaign



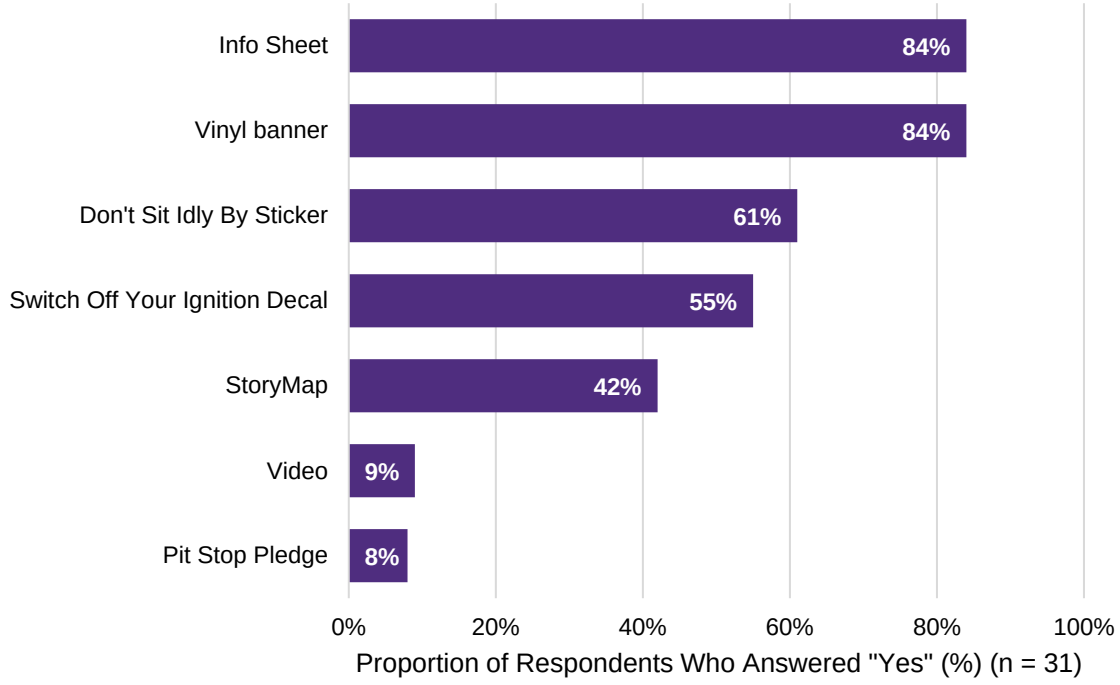
Part B: Post-campaigns survey results

There were several questions on the Part B survey that were not included in Part A. These questions asked about the efficacy of campaign assets and messaging.

Q: Over the past two to three weeks, your school participated in an Idling Awareness Campaign. Please indicate if you noticed, received, read, or participated in any of the following activities: (n = 31)

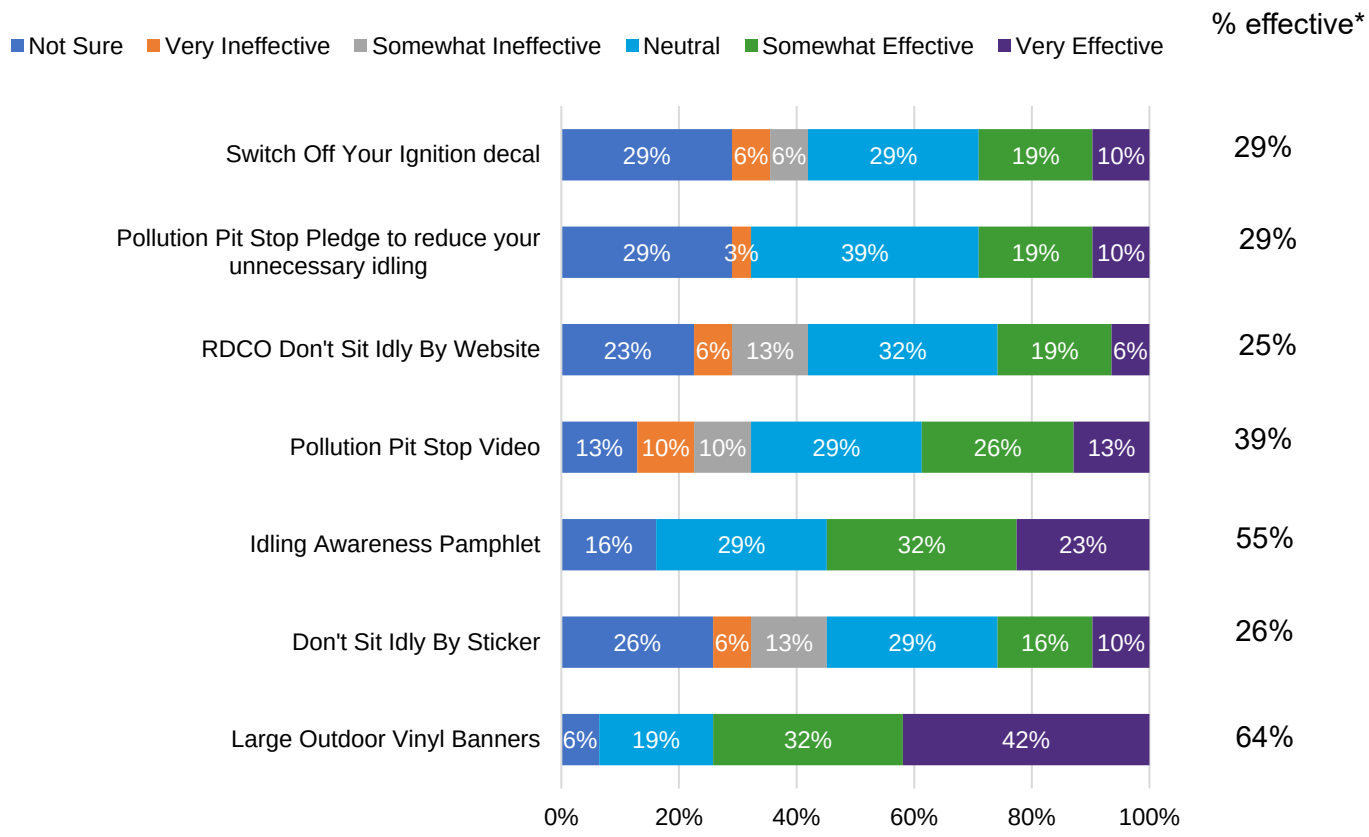
Of those who responded to the survey, 30 of 31 encountered at least one piece of idling awareness educational material(s).

The info sheets and vinyl banners were highly effective, with 84% of respondents indicating that they noticed, received, or read these materials. Over half of the respondents noticed or received the Don't Sit Idly By sticker (61%) and the Switch Off Your Ignition decal (55%), while less than half interacted with the StoryMap, video and Pit Stop Pledge.



Q: Were the following communication methods effective in teaching or bringing awareness to idling? (n = 31)

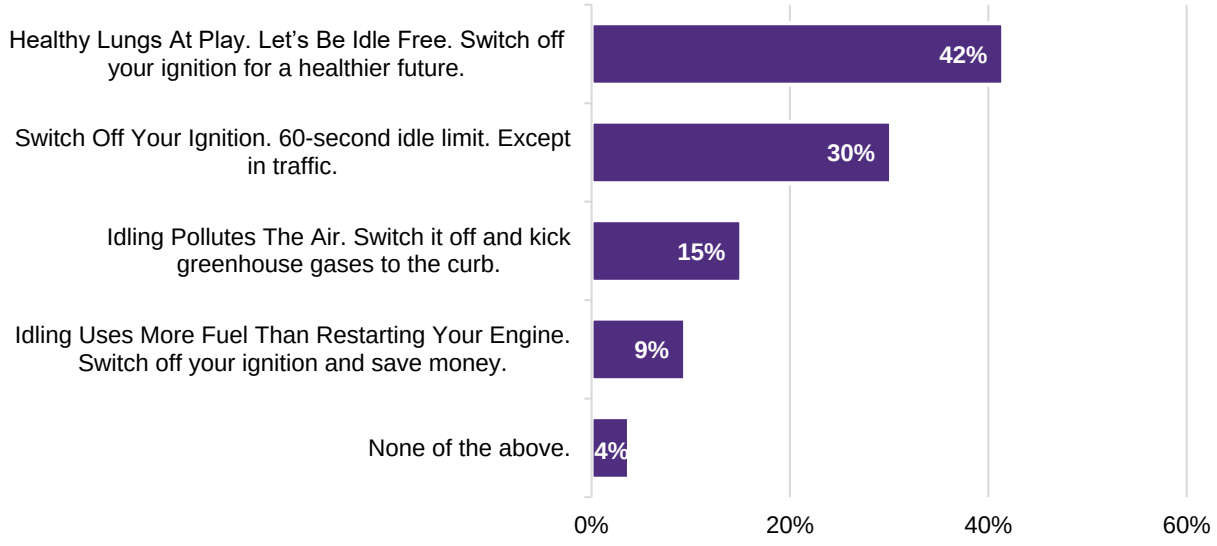
Nearly three-quarters (74%) of respondents believe that the large outdoor vinyl banners were an effective[4] communication method. Fifty-five percent (55%) of respondents also found the idling awareness pamphlet effective.



[4] Selected either “Somewhat Effective” or “Effective”

Q: Over the last several weeks, your school put up 2 to 4 outdoor banners that created awareness around the impacts of idling. What signage resonated with you most? Please select all that apply. (n = 53)

Forty-two percent (42%) of respondents indicated that “Healthy Lungs at Play. Let’s Be Idle Free. Switch off your ignition for a healthier future,” resonated the most with them.



Pledges

As part of the idling awareness toolkit, parents were asked to take the “Pit-Stop Pledge” and commit to not idling for greater than 60 seconds. Taking the pledge was incentivised through a pizza party lunch to the grade at each school with the most pledges.

At the end of this study, there were a total of 51 pledges, with 27 pledges from Quigley Elementary and 26 from Springvalley (**Table 4**).

Table 4. Number of pledges received after the idling awareness campaign.

School	Post-campaign # of pledges
Quigley Elementary	27
Springvalley Elementary	26
Other	3
TOTAL	**58**

Other notable data & observations

The following data were collected on the educational campaign can be found in **Table 5**.

Table 5. Access to online idling awareness assets

	TOTAL
Number of visits to the StoryMap	96
Number of views on the Pollution Pit Stop video	36
Scan of QR code to Part B Survey	11

Evaluation

At the conclusion of the experiment, results are interpreted, analysed, and sometimes visualized to understand if the intervention (an idling awareness campaign) impacted behaviour or sentiment.

The study's key insights include:

Idling observations

- For both schools, there were many more non-idling vehicles than idling vehicles*, overall.*
- At Quigley, the proportion of idling vehicles pre-campaign and post-campaign was relatively the same, with no idling reduction achieved.
- At Springvalley, the proportion of idling vehicles decreased post-campaign by four per cent (4%).
- At Quigley, parents idled slightly more as the temperature decreased (idling time increased only by 17 seconds).
- At Springvalley, parents idle more as the temperature decreases (idling time increased by 1 min and 30 sec).

Idling habits

- Respondents idle most frequently in the winter months; an idling awareness campaign did not impact this response.
- Respondents idle less than half of each time they drive; an idling awareness campaign did not impact this response.
- Respondents idle between 1 and 5 minutes per day; an idling awareness campaign did not impact this response.
- Of those who were exposed to at least one idling awareness assets, there was a slight increase (1%) of those who switched off their ignition.

Idling sentiments

- Respondents believe that idling is “somewhat of a problem” at their school; an idling awareness campaign did not impact this response.
- The concern for idling in “your community” went from neutral to taking some sort of position after the delivery of an idling awareness campaign.
- Respondents concerns around idling are primarily related to environmental impacts, followed by concerns about health and well-being, then wasting fuel and money.
- Post-campaign respondents expressed slightly higher concern about the impacts of idling on local air quality, climate change, and the health of themselves or the health of others.
- Concerns over air quality and health increased by 7% and 6%, respectively.

Idling awareness

- The idling awareness campaign did not contribute to greater awareness of *others* idling their vehicles.
- The idling awareness campaign created greater idling *self awareness* in 5% of respondents.
- Greatest knowledge gaps around idling came from the following in both surveys:
    - In the winter months, the best way to warm up my vehicle is to drive it.
    - It takes more gas to restart your car than it does to leave it running.
    - With advanced emissions technologies used in today’s vehicles, carbon dioxide emission from an idling vehicle are greatly reduced.

Willingness to change

- While respondents are quite willing to change their idling habits, the idling campaign did not increase willingness.
- The most compelling reasons one would change their idling behaviour include the following:
    - **Health:** To improve air quality and minimize negative health impacts
    - **Environment**: To reduce harmful emissions that can contribute to climate change
    - **Personal savings**: To save money on gas
    - **Modeling behaviour:** To set a good example for my children
- The idling awareness campaign did not elicit a self-reported behaviour change.

Reaching our audience

- Information pamphlets and large outdoor vinyl banners in high traffic areas are an effective way to reach this audience (74% of respondents indicating that they noticed, received, or read these materials).
- Over half of the respondents noticed or received the Don't Sit Idly By sticker (61%) and the Switch Off Your Ignition decal (55%), while less than half interacted with the StoryMap, video, and Pit Stop Pledge.

Effective educational tools

- Large outdoor vinyl banners placed at high-traffic locations are an effective way to communicate and raise awareness about idling.
- Other effective educational tools include information pamphlets and video.
- Stickers or decals, the StoryMap website, and the pledge call-to-action were the least effective educational tools.

Messaging

Four versions of the outdoor vinyl signage were created, each with a different line of messaging related to: health, action, environment and saving money.

- Health-related signage resonated most with this audience (42%).
    - *Healthy Lungs at Play. Let's Be Idle Free. Switch off your ignition for a healthier future," resonated the most with them.*
- Action-oriented signage also resonate with this audience (30%).
    - *Switch of Your Engine. 60-second Idle Limit except in traffic*.
- Messaging related to the environment or saving money resonated the least.

Conclusion

Key insights

This pilot program had some successes and challenges. The greatest limitation to having stronger results was the small sample size for both surveys and the large disparity between temperatures during the pre- and post-campaign observations.

Some behaviour change was observed at one location, while the other location did not exhibit behaviour change. Anecdotally, one observation of a bus driver switching off their engine after the outdoor signage was displayed may provide insights into a new audience / renewed efforts for more education with the bus driving community. Self-reported idling only marginally decreased (1%) of those exposed to at least one asset in the idling campaign. With a greater sample size, this result may provide more significant insights.

As far as idling sentiments go, perceptions of respondents' own idling habits didn't change. However, it should be noted that survey respondents had low reported idling tendencies to begin with. Interestingly, survey respondents reported a 5% increase in self-awareness when it comes to idling and increased concern over the negative impacts of unnecessary idling (health and air quality). This heightened awareness can bring people closer to changing their behaviours over the long term and even sharing their knowledge or concerns with others, which further expands the reach of the true objective of this work to reduce unnecessary idling.

For future campaigns, there were several insights gained through this process. There is an opportunity to further educate on some of the more technical aspects of idling (see above notes). Messaging around health, action and environment resonate more than saving money. Lastly, large outdoor signage in high-traffic locations is an effective way to reach audiences, while information pamphlets and video are effective methods of education.

Finally, it's unclear whether replicating this campaign with this audience will produce behaviour or sentiment change. While the educational assets are already created, there are still costs associated with printing, circulation of materials, liaising with school district staff and parent advisory groups, on-site observations, adjusting surveys, survey analysis and reporting. These resourcing costs should be accurately re-budgeted to determine the actual costs of replication. At minimum, there is an opportunity to re-use the banners in high-traffic locations as this is an effective method of reach, education and increasing self-awareness. There are also opportunities to adjust messaging related to idling, focusing less on saving money and more on health and the environment.

Scaling

- Repeating this study would require the following elements to be completed by staff or a consultant. This resource implication should be taken into consideration if the decision.
    - Relationship building with the school

Study limitations

- Survey sample size was too small to provide conclusive results. Greater effort needs to be taken to encourage participation (earlier outreach with PACs, etc.), or the methodology needs to be modified to seek greater insights; see the first bullet under “for consideration” as an option to gain better insights.
- Pre- and post-idling observations should be taken during a smaller temperature spread at less than three degrees Celsius (in the winter, not summer) to have more comparable results.
- Study methodology was not designed to be administered to a specific test group (i.e., families participating in drop off or pick up varied everyday). Therefore, it’s difficult to confidently say there is a cause-and-effect relationship after the treatment was delivered. While generalized assumptions can be made, direct linkages cannot.

For consideration

- There could be more potential with the data if the results, pre- and post-campaign, were combined to increase the sample size. This wouldn’t provide insights into the efficacy of a campaign but would provide insights into reported idling habits and sentiments to understand the behaviour better.
- There might be some greater insights to be obtained by cross-tabulating some of the data; however, it should be noted that cross-tabulation further decreases an already small sample size. Consider combining the data and then conducting cross tabulation.
- Monitor the reach of online communication methods such as the video and StoryMap to gain further insights into outreach success.
- Re-use the banners with schools annually, without the BI study, to continue to raise awareness and promote self-awareness, which can lead to a reduction in unnecessary idling.

Appendix

Campaign

The idling awareness campaign consisted of the following:

Banners: Four outdoor, vinyl banners (48” x 96”) were developed with four separate messages and were placed near common idling locations at each of the two schools involved in the study.

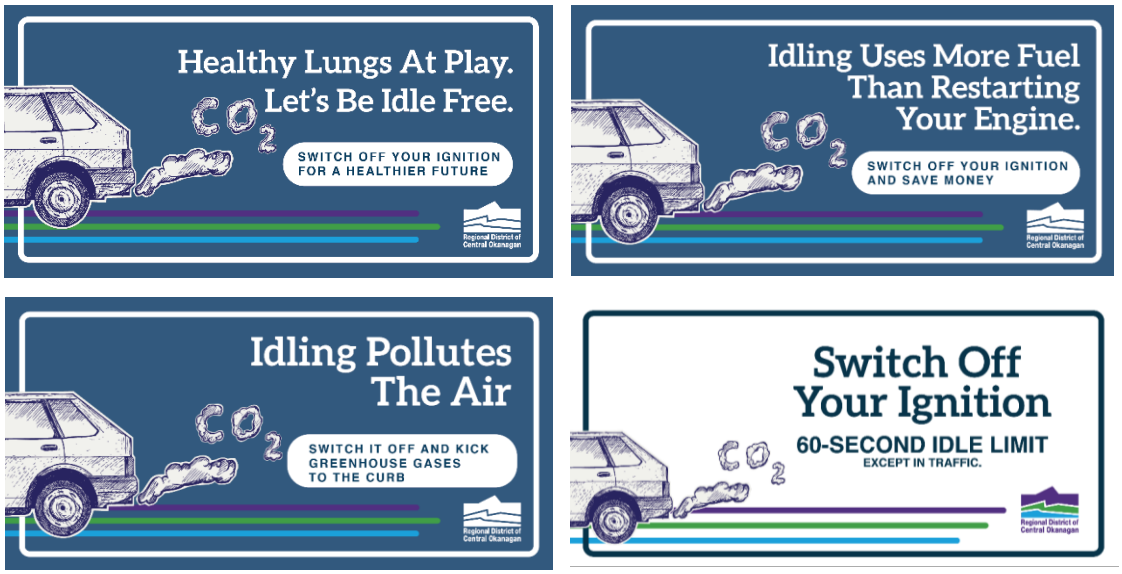


Figure 1. Idling Awareness Outdoor Banner

Idling Awareness Toolkit: An idling awareness toolkit was developed and circulated to each family at both Springvalley and Quigley Elementary Schools. The kit contained the following:

- Don’t Sit Idly By Sticker
- Switch Off Your Ignition Idling Decal
- Pollution Pit Stop Info Card
- Idling Postcards RDCO & City of Kelowna

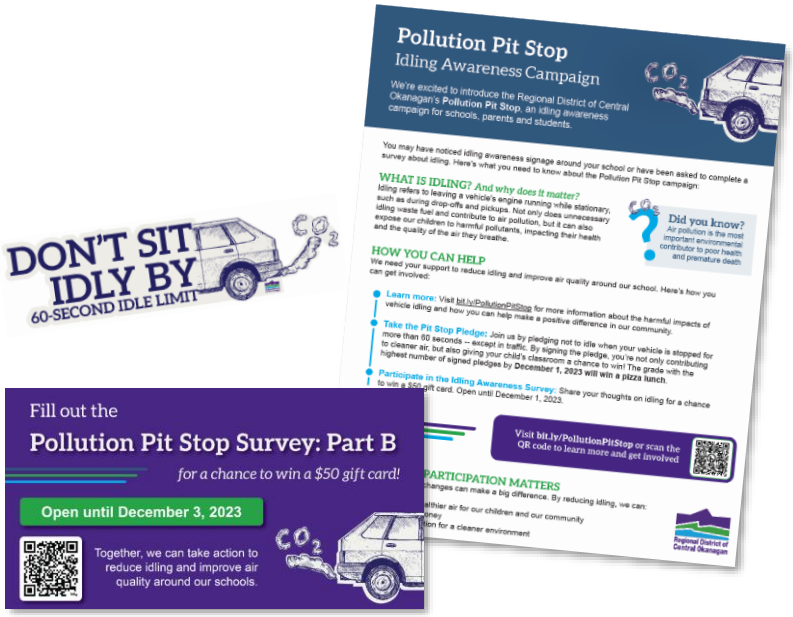


Figure 2. Contents of the Idling Awareness Tool-Kit

StoryMap & Video: Printed materials encouraged families to access the resources on the StoryMap, which provided an opportunity to learn more about the impacts of idling, watch a kid-friendly video, and take the Pit Stop Pledge.

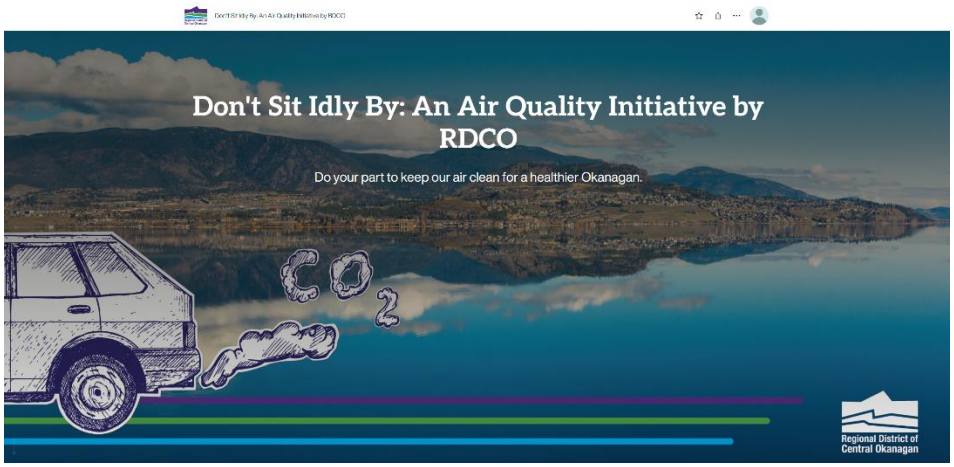


Figure 3. StoryMap cover page

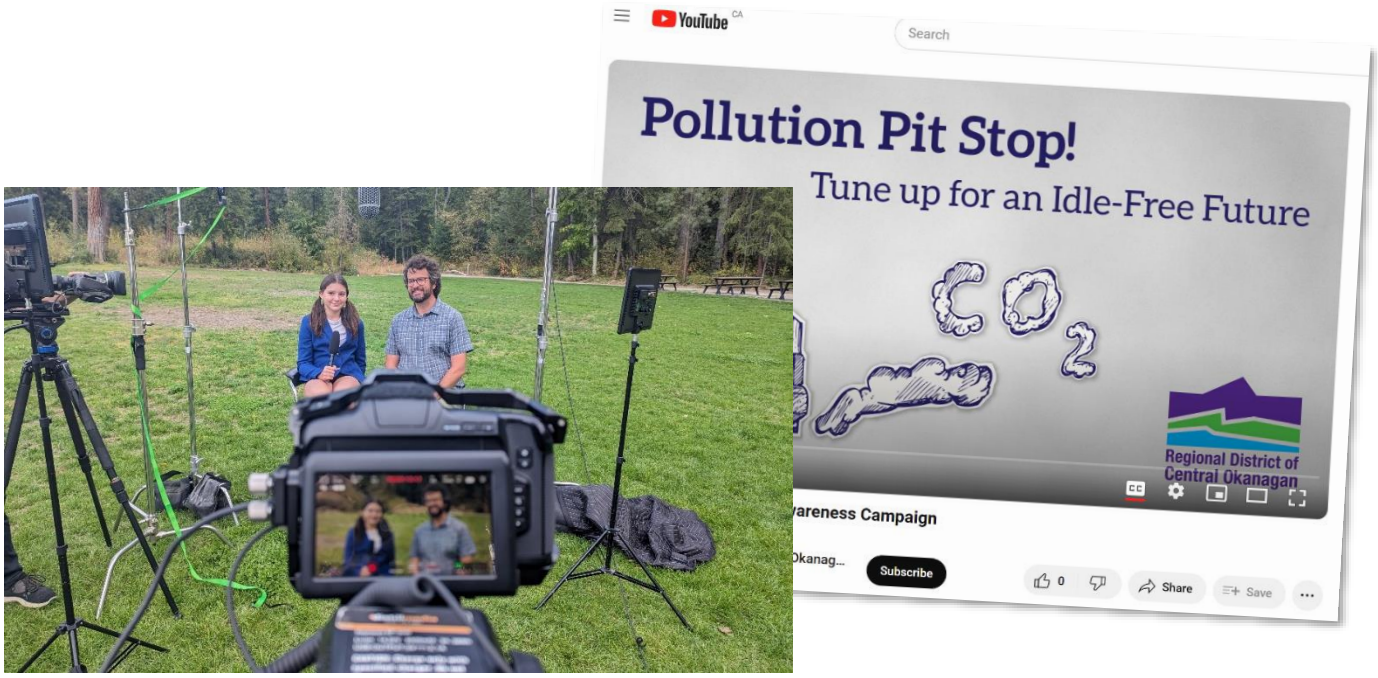


Figure 4. Pollution Pit Stop filming (left) and video (right)