Caring for the Air

2017
The Lower Fraser Valley Airshed

Metro Vancouver is situated within the Lower Fraser Valley. Air pollution can freely cross our borders both from and into the surrounding areas. These include the Fraser Valley Regional District to the east, Whatcom County in the State of Washington to the south, Vancouver Island to the west and Howe Sound and the Sunshine Coast to the north.

Managing air quality successfully requires effective collaboration with our neighbours and other levels of government, and participation from businesses, public institutions, non-government organizations, and residents. Many of the articles in this publication reflect these partnerships.

We would like to acknowledge the contributions made to this publication by:
Andreas Christen, UBC
Health Canada
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There are many different sources of greenhouse gases that contribute to climate change. It is very difficult to find one single solution to be applied universally.

The closest we can get to a silver bullet is arguably the BC carbon tax, which puts a price on most greenhouse gas emissions. But it requires most jurisdictions to put a carbon tax in place to be effective and even then it’s challenging to raise the carbon tax to a level that will cause greenhouse gas emissions to drop fast enough.

Since a silver bullet is elusive, Metro Vancouver and its member jurisdictions are pursuing a wide range of actions. Each year, local governments in our region implement dozens of climate actions, from low carbon district energy systems to heat buildings, to the adoption of electric vehicles in municipal fleets. They are also taking action to become more resilient to the changing climate, increasing flood protection infrastructure and planting street trees that can handle hotter drier summers. Local governments report on these climate actions to the province in their annual reports. You can find the reports on the Government of British Columbia’s Community Energy & Emissions Inventory website.

Metro Vancouver completed 60 actions in 2015, and over 75 projects in 2016. Now, with the development of a new integrated regional climate action strategy, Metro Vancouver will be building upon its current actions and identifying opportunities to accelerate their progress. The strategy will create a framework for directing climate action towards achieving the region’s greenhouse gas reductions targets and climate change adaptation objectives.

The strategy will also ensure that climate change is considered in every decision to reduce emissions or adapt to our infrastructure. By spreading our investment of energy and resources across many different actions, we feel confident that this strategy will be successful.
Driving into the Future

Technology is quickly changing the world of driving. Cars are becoming more computerized and networked. This is changing how we drive and what we drive. Here are some of the latest developments and changes we might see by 2030.

Near road monitoring using new techniques is helping us understand pollution levels near busy roads. See some results from Canada’s first near-road air quality monitoring station in “Near Road Monitoring” on page 6.

Vehicles could provide instant feedback to encourage Smart Driving techniques in the future. Metro Vancouver recently completed a study to test the effectiveness of providing feedback to drivers about improving fuel economy and reducing emissions (see “Smart Drive Challenge”, page 20).
Autonomous vehicles are poised to arrive within the decade. These are expected to improve road safety and reduce environmental impacts through lower fuel consumption (in ‘Driverless Cars’, page 12, Caring for the Air 2016).

Electric vehicles will be much more commonplace, which will have huge benefits for local air quality and climate change (see ‘All Charged Up About Electric Cars!’, page 8, Caring for the Air 2014).

Car sharing offers an important transportation option for many, with a network of over 2,000 vehicles in our region today. Read more about the environmental benefits and future challenges on page 4.

Streetlight and induction curbside charging will help more people switch to electric vehicles. This is especially important in areas where vehicle owners primarily park on the street overnight (see ‘Garage Orphans’, page 19).
Need a ride, but not your own ride?

Car sharing has become an important transportation option for many Metro Vancouver residents and a valuable part of climate change solutions. A network of over 2,000 passenger vehicles provides people with access to vehicles based on an hourly and/or distance-based rate. Modo and Zipcar are two-way car share providers (the same pick-up and drop-off location) and car2go and Evo are one-way car share providers (the vehicle can be dropped off anywhere within the operating service area).

A 2014 Metro Vancouver car share study noted some of the regional benefits of car sharing and some challenges for land use and transportation planning. The study showed that each car share vehicle in the region has effectively taken between five and eleven private vehicles off the road, either because people have shed their own car after becoming a member or because they avoided buying a car. This helps reduce emissions associated with vehicle manufacturing globally.

A potential drawback in the rise in car sharing is ‘induced driving’, or people driving more after joining a car share than before they joined. The 2014 study showed that for members who did not own a vehicle prior to joining a car share, nearly half (48%) reported driving more afterwards. This could lead to increased emissions of air contaminants and greenhouse gases.

Looking ahead, car share providers are eyeing suburban parts of the region for expansion, particularly near rapid transit stations. Car sharing in these areas could enhance the appeal of public transit and encourage a ‘car-free’ or ‘car-lite’ lifestyle. However car share demand may be initially lower in these areas than in other established car share locations. It may take time to develop and nurture the new markets.

Metro Vancouver will continue to monitor the effects of established and emerging transportation choices and provide information to residents so they can make informed choices about the many transportation alternatives available.

For more information, search ‘car share study’ at metrovancouver.org.
A new method to map carbon dioxide emissions using car-sharing vehicles

Greenhouse gas emissions data are usually presented at the municipal scale. Having higher resolution information at street and block scales could be useful when trying to design effective and efficient policies to help reduce emissions, but it can be difficult and expensive.

UBC Professor Andreas Christen and his team have recently looked at a new approach to measuring carbon dioxide (CO₂) emissions at local scales in cities. Graduate student Joey Lee and research engineer Zoran Nesic designed a way of using affordable and compact CO₂ sensors on regular car-sharing vehicles and even bikes. This approach enables measurements to be made continuously over a large area, in order to determine how CO₂ concentration varies spatially.

As the sensors are transported through the city, CO₂ measurements are recorded automatically. Temperature, time and location information are also logged with each CO₂ measurement. Data from many measurement points are combined into a ‘grid cell’ that represents blocks and streets in a small area. A map is created from the grid cells. Simultaneously, background CO₂ levels were measured on top of a tall tower, and compared with measurements from the mobile street level instruments. Key sources of emissions are then identified from the occurrence of higher street level CO₂ concentrations. For example, vehicle traffic is an important source of emissions in cities, so busy intersections will show up as CO₂ hotspots.

To check the mobile mapping approach, the UBC team measured CO₂ in a 12 km long by 1 km wide area in the City of Vancouver at different times of the year. The results were recently published in a scientific paper (Lee et al., 2016). The team found that in some parts of the city CO₂ was being sequestered by the trees. The team also compared the emission maps created from their measurements with information from independently modelled fine-scale emission inventories. The results were promising, with the measured and modelled emissions agreeing quite well on average.

Reference:
Living near a major roadway has been identified as a risk factor for a number of respiratory symptoms and cardiovascular problems. In Metro Vancouver, more than 20% of the population lives within 100 metres of a major roadway.

You may have driven by Canada’s first Near-Road Air Quality Monitoring Station on Clark Drive near 12th Avenue in Vancouver without even knowing. In fact, air pollutants from your vehicle may have been measured at the station. Metro Vancouver operates the station on Clark Drive, a major truck route, in cooperation with Environment and Climate Change Canada and the University of Toronto. It measures traffic-related air pollutants which are associated with adverse health effects.

A map like the one shown above was done for the entire region, and shows how an analysis of traffic volume and population density were used to find the best location for the monitoring station. Clark Drive uses specialized instruments such as ultrafine particle monitors, as well as instruments found at air quality monitoring network stations. Air quality measurements have been collected for over one year.

Preliminary study results showed that pollution levels near busy roads tend to be higher. Levels would be expected to drop off quickly with distance from the roadway. Carbon monoxide is a pollutant emitted in vehicle exhaust. The graph on the next page shows how levels varied throughout the day on weekends and weekdays. The effects of traffic can be seen. On weekdays, concentrations increased rapidly as rush hour traffic builds in the morning and evening. On weekends, concentrations were lower throughout the day. When measurements are assessed by wind direction the highest concentrations occurred when winds blow from the road toward the station. Lower concentrations are observed when winds blow from the residential area toward the station.

Locations where the busiest roads intersect with the densest populations can be seen in red.
These patterns in pollutant concentrations demonstrate that traffic emissions and air quality near major roadways are linked.

Emissions from motor vehicles are one of the largest sources of air pollutants in our region. Metro Vancouver runs a number of programs to reduce emissions from cars and trucks and is evaluating other regulatory and non-regulatory options for reducing emissions. Check out pages 2 and 3 for more information.

UFP – What it is and what we know about it

Ultrafine particles (UFP) are the very smallest particles that can be measured using air monitoring equipment. Each particle is less than 0.1 μm in diameter – that’s less than 100 billionths of a metre. UFP are so small that new measurement methods had to be developed.

UFP come from natural processes, such as wildfires and plant secretions, and human activities. Human sources of UFP include everyday activities like peeling citrus fruits and cooking meat, as well as some industrial operations. UFP can also be formed in the air from other pollutants.

A major source of UFP is fuel combustion, particularly in vehicle engines where no particulate matter emission controls are in place. Metro Vancouver has been working with Environment and Climate Change Canada and other partners to assess UFP during the near-road study.

Researchers are also investigating UFP and are working to understand their health effects. Diesel soot is one example of a pollutant that contains UFP, and is known to be harmful to our health.
Canadians don’t spend a lot of time commuting compared to being at home or at work. Surveys by federal government agencies found that we spend about 5% of our day, or about an hour, ‘in transit’. But we are often close to traffic-related air pollution while commuting. These traffic emissions may be responsible for a significant part of our overall daily exposure to air pollutants, such as fine particulate matter (PM$_{2.5}$).

Health Canada has been looking at traffic-related air pollution in car, bus and subway (or SkyTrain) environments. They worked collaboratively with several public transit authorities in Metro Vancouver, Toronto, Montreal, and Ottawa on a study to assess air quality in Canadian transit environments. The rail transit systems studied are sizeable as each is approximately 68 km in length. Together they serve about 2.5 million commuters each day.

The study found that air pollutant levels in the Toronto subway, the Montreal metro, and the SkyTrain in Metro Vancouver were tied to unique aspects of their design, such as the material used for the wheels and whether the system was open air or below ground. PM$_{2.5}$ levels measured in the SkyTrain system clearly identified the segments running below ground. It also revealed that particle levels increased in areas further from open air segments of the system. Interestingly, PM$_{2.5}$ exposures in both the below-ground and above-ground portions of the SkyTrain were higher on platforms than in the trains. This suggests train cabins offer a protective effect.

Throughout Canada, agencies strive to continually improve the quality of the air we breathe. The results are being used to develop assessment methods to improve air quality in transit environments. Health Canada is supporting increased use of public transit by identifying inexpensive and effective opportunities to make improvements. This plays an important role in reducing air pollution in urban areas and public health protection.
Air Quality in 2016

In July 2016, a major fire in Burns Bog in Delta resulted in a large visible smoke plume and elevated levels of particulate matter for a few hours. In spite of local smoke effects and the widespread smell of smoke in parts of the region, shifting winds and good dispersion meant that conditions did not become worse that the short-term air quality objective (25 μg/m³) for fine particulate matter, which is a major component of smoke.

In 2016, several health and air quality agencies, including Metro Vancouver, collaborated to develop improvements to the sensitivity of the Air Quality Health Index (AQHI) to smoke from wildfires. A pilot project was initiated to see whether the changes will provide people with more useful information when smoke infiltrates the region.

Air Quality Trends

The regional trends charts (right) illustrate the change in average air quality across the region over time. Measurements from monitoring stations between West Vancouver and Hope are averaged to represent the ambient (outdoor) air quality typically experienced in the region.

Average trends for the region show that improvements have been made over the last decade for most air contaminants, even while the region’s population has grown. The region’s air quality improvements are a result of many emission reduction actions that have been implemented. Sulphur dioxide levels continued to improve mainly due to stricter requirements for lower sulphur in marine fuels (see page 13) while improved vehicle emission standards and the AirCare program have been largely responsible for lower carbon monoxide and nitrogen dioxide levels.

Peak ground-level ozone levels (not shown), which occur during summertime hot and sunny afternoons, are better now than in the 1980s and early 1990s. However, despite lower levels of pollutants that form ground-level ozone, average levels of ground-level ozone are increasing. This is partly due to an increase in ozone formed outside Canada coming into our region. Metro Vancouver and partners have developed a ground-level ozone reduction strategy to address this issue.
FINE PARTICULATE MATTER (PM$_{2.5}$) IN 2016

In 2016, fine particulate matter (PM$_{2.5}$) levels throughout the region were better than the Canadian Ambient Air Quality Standard (see map above). Measurements averaged over the entire year were within Metro Vancouver’s annual objective. Peak levels, based on the highest 24-hour average, were worse than the short-term objective (25 μg/m$^3$) on one day at the Mission station and a separate day at the Abbotsford-Airport station, both occurring in spring. A combination of factors including emissions from local sources, such as heating, transportation and burning, along with stagnant weather conditions are thought to have caused these exceedances.

GROUND-LEVEL OZONE IN 2016

Ground-level ozone forms when nitrogen oxides and volatile organic compounds react in the air in the presence of sunlight. Ground-level ozone levels were better than Metro Vancouver’s air quality objectives and the Canadian Ambient Air Quality Standard at all monitoring stations in 2016. The map above shows how measurements for 2016 compared to the Canadian Ambient Air Quality Standard.
SULPHUR DIOXIDE IN 2016

Average concentrations of sulphur dioxide for 2016 are shown above with all stations equal to or less than 1 ppb. Average levels continued to decrease significantly in 2016 compared with previous years and can be attributed to stricter marine fuel requirements. Levels were better than Metro Vancouver’s air quality objectives at all stations in 2016 except for at the Chilliwack station that exceeded the numerical level of the 1-hour objective (75 ppb) during an airshow event. Since the largest emission sources in the region are marine vessels (mainly ocean-going vessels) and the oil refinery in Burnaby, the highest sulphur dioxide levels are observed near these sources, especially in the Burrard Inlet area.

NITROGEN DIOXIDE IN 2016

Nitrogen dioxide concentrations were better than Metro Vancouver’s long-term and short-term air quality objectives throughout 2016. Annual averages are shown on the map. More than half of the regional emissions of nitrogen oxides (which includes nitrogen dioxide) come from transportation sources. The highest average nitrogen dioxide concentrations are measured in highly urbanized areas near busy roads.
Sophisticated instruments provide high quality data from 29 long-term air quality monitoring stations operating continuously in Metro Vancouver and the Fraser Valley. Instruments are routinely checked, serviced and calibrated against known standards according to federal protocols. Metro Vancouver technicians can also connect to stations remotely to check instrument operation. Preliminary data from the air quality monitoring network are published live every hour on airmap.ca.

Air quality data are not considered validated until they have been reviewed by qualified staff to ensure the measurements are accurate. Measurement data goes through a quality assurance process, such that only validated data are published in formal reports on air quality in the region.

Metro Vancouver’s Mobile Air Monitoring Unit (MAMU) and smaller portable instruments enhance monitoring coverage and can provide samples for detailed laboratory analyses. Monitoring results from MAMU were reported in 2016 for specialized studies in Lions Bay and the City of North Vancouver. These studies compared data collected by MAMU with network stations and provided information on a number of local issues including traffic, industrial emissions, and smoke from residential wood burning. Metro Vancouver plans to expand mobile and portable monitoring capabilities, to further augment the existing network.

Emerging technologies have now made air quality monitoring possible using very small sensors. While these sensors may give up some accuracy and quality compared to the instruments used in the network, many are low-cost, easy to install, require little power, and can share data using wireless connections and smart phone apps. Some are even wearable and provide information on an individual’s exposure to air pollution throughout the day. Increasingly popular use of these devices by “citizen scientists” may offer people an opportunity to improve their understanding of how pollution levels vary throughout their community and at home. Metro Vancouver will be assessing these small sensors in monitoring air quality in the region.
Sulphur dioxide (SO₂) is an air pollutant that is emitted when sulphur-containing fossil fuels are burned. The good news is that emissions and levels of SO₂ measured in our region are decreasing. This has a positive impact on our health. SO₂ can cause people with lung conditions such as asthma to experience breathing problems, increases in hospital admissions, and even premature death. It can also react with other substances in the air to form fine particulate matter or acid rain.

Historically, marine vessels were the largest source of SO₂ emissions in our region. Ships’ fuels contained much higher amounts of sulphur compared to fuels used in cars and trucks. The governments of Canada and the United States recognized the impact of ship emissions on coastal air quality and worked with the International Maritime Organization to designate an Emission Control Area (ECA) in North American coastal waters. This meant that starting August 1, 2012, the level of sulphur allowed in marine fuels was decreased by more than 75%. This further reduced by 90% on January 1, 2015.

To see if the expected air quality improvements occurred after the introduction of the ECA, Metro Vancouver and the Vancouver Fraser Port Authority developed a passive SO₂ monitoring program for the Burrard Inlet area. Passive samplers work by allowing air to diffuse across a sensitive surface, rather than actively pulling air samples into an instrument. Therefore they require no power or maintenance. Five samplers have been installed in Vancouver. The results show a striking reduction in average SO₂ levels occurred after January 1, 2015 (see chart below).

Metro Vancouver and partners are reviewing the air quality objective for SO₂. You can see how current SO₂ levels in our region compare to the objective by checking out Airmap.ca, as well as the air quality data summary provided in this Caring For the Air report.
Why don’t you charge them with pollution?

Metro Vancouver is often asked, “Why aren’t you charging Company X with pollution?” or “How can you issue a permit to Company Y? They are going to emit chemicals and cause pollution.”

Air contaminants are emitted from many sources. Metro Vancouver’s Air Quality Management Bylaw allows the District Director to authorize the discharge of “air contaminants” but it prohibits anyone from discharging an air contaminant so as to cause “pollution”.

Pollution is caused when air contaminants reach levels that “substantially” change how people, plants and animals are able to use the environment. “Substantially” is the key, but what is substantial?

- Is it when Metro Vancouver’s air quality objectives are exceeded, if so how many times and by how much?
- If people’s lives are being adversely affected, how many people, how frequently and how severe must the effects be?
- Is it when a doctor has told you that a facility’s emissions are affecting your health?

The determination of pollution is a judgment call that may be complex and somewhat subjective.

If it is determined that pollution is being caused, Metro Vancouver’s District Director may issue an Order to stop the pollution. However, an Order may be appealed to the BC Environmental Appeal Board. Alternatively, Metro Vancouver may charge someone with causing pollution, which must be proven in a court of law.

An air contaminant is a substance emitted into the air that can:
- injure the health or safety of a person
- cause material physical discomfort to a person
- damage the environment
- interfere with the normal conduct of business
- injure property or any life form
- interfere with visibility

Pollution is the presence in the environment of substances or contaminants that substantially alter or impair the usefulness of the environment.

The District Director is a staff person appointed by the Metro Vancouver Board, who has permitting authority.
Odours are a frequent complaint by Metro Vancouver residents. In 2016, Metro Vancouver received nearly three times as many complaints related to odours than in the previous year. Sources of odorous air contaminants can include waste management facilities, rendering plants, animal feed producers, food processors, restaurants, petroleum refineries, and agricultural activities. Depending on the terrain and weather conditions, odorous air contaminants can be transported over long distances and reach many people.

A person’s exposure to odours may have various effects, ranging from noticing that the air ‘smells different’, to negative impacts on business activities, on a person’s physical health, or impairing people’s ability to enjoy their environment. Metro Vancouver tackles impacts from odorous air contaminants in several ways.

Responding to Complaints
When a complaint is received by Metro Vancouver, staff follow up to see what might be causing the odour. Weather information, the complainant’s description, and on-site observations (when appropriate) help staff determine the probable source of the odour and what further action may be needed.

Complaints can be made through a phone line at 604-436-6777 or on the Metro Vancouver website (search ‘Air Quality Complaint’ on www.metrovancouver.org). Helpful information that complainants can provide includes a full description of the odour, the effects and locations.

Regulating Odours
Metro Vancouver regulates the discharge of odorous air contaminants through permits and approvals for specific facilities. There are also regulations for types of facilities or activities that share similar characteristics. Permits and approvals can include facility-specific requirements covering operating standards, collection and treatment of air contaminant emissions, and measurements of specific odorous air contaminant emissions. Permits and approvals can also include limits on authorized emissions.
Open burning has traditionally been used to dispose of debris generated from gardening, land clearing activities and agriculture. Many people have also experienced open burning from campfires. But smoke from burning wood and other vegetative matter is harmful to our health and can cause air pollution.

Smoke contains tiny particles of fine particulate matter (PM2.5) and hundreds of other substances, some toxic. The particles in smoke are too small to be filtered by the nose and respiratory system, so they are inhaled into the deepest parts of our lungs. Smoke is associated with all sorts of health problems — from a runny nose and coughing, to bronchitis, asthma, emphysema, pneumonia and heart disease. It also causes other problems, such as spoiling our region’s beautiful views. Much of the material burned could be recycled or turned into valuable products, such as compost or particle board.

Rules and regulations have been put in place in the Metro Vancouver region to control open burning activities and limit harmful effects. For instance, to prevent the release of dangerous toxins, the following materials should never be burned in open fires, without appropriate air emission controls: tires, plastics, drywall, demolition waste, domestic waste (household waste materials and food waste), biomedical waste, asphalt and asphalt products, treated lumber, railway ties, manure, rubber, paint and paint products, tar paper, and containers for gasoline, motor oil, fuel, or lubricants.

For more information on the rules and regulations that apply in your area, please visit Metro Vancouver’s website (search for ‘open burning’) and contact your local municipality. You can also check out Metro Vancouver Recycles for information on recycling or disposal options for wood, vegetative waste, and materials that should not be burned in open fires.
Improving Your Condo Building’s Energy Use

Building systems need to be replaced as condo buildings age. Renovations offer opportunities to install new systems with better energy performance. Energy advisors conduct building energy audits to help identify these opportunities, calculate costs and energy savings, and recommend the most appropriate technologies and approaches. Metro Vancouver will be launching a strata energy advisor program in 2017 to help strata corporations understand where system improvements can be made in their building.

There are over 7,000 strata associations in Metro Vancouver, which are responsible for more than 800,000 tonnes of greenhouse gas emissions per year. If all condo buildings undertaking major repairs chose energy efficient options, these buildings would emit between 2,000 and 9,000 tonnes less greenhouse gases per year, while saving up to $650 per unit per year on energy bills.

Individual owners and strata councils can reduce energy use and greenhouse gas emissions with simple actions. Individuals could install programmable thermostats, timers on natural gas fireplaces, weather stripping around windows and doors and even wash clothes in cold water to reduce energy use. Tuning up boilers, heating systems, and weather proofing can reduce a strata’s energy bills in buildings.
Our home is one of the biggest purchases we will ever make and yet there are some important things we have very little or no information about when deciding which home to buy, such as energy use and carbon emissions.

Single-family homes are responsible for about 40% of the greenhouse gases coming from buildings. To reduce these emissions, tools are available to help people make decisions that are better for their families and the environment.

Home energy labels, like the EnerGuide Rating System, tell us how energy efficient a home is, how efficient it could become, and how it compares to other rated homes.

Energy efficient homes do more than save you money on utility bills; they are often healthier homes with better indoor air quality, fewer moisture problems, and are quieter and better insulated from outside temperatures and noise.

RateOurHome.ca creates awareness of home energy labels to make carbon emissions and energy use in homes more visible for everyone. The Home Energy Map on RateOurHome.ca allows owners or builders to display their property’s EnerGuide label. You can search properties by EnerGuide rating, type of home, and by location on the map. It’s a great way to learn more about how homes perform when it comes to energy efficiency and carbon emissions.

What better way to start lowering your carbon footprint while making smart decisions for you and your family? With RateOurHome.ca, spotting an energy efficient home just got easier.
Garage Orphans

Like most of her neighbours, Karen parks on the street. In 2015, she purchased an electric vehicle (EV) for commutes within the city. She charges her vehicle exclusively in public places – the library, the rec centre, the mall. Karen is an example of what we refer to as a “garage orphan”.

Garage orphans are residents without access to off-street parking or those with off-street parking but no reliable access to electricity. Typical garage orphans live in:

- Single family homes where there is no driveway, garage or carport.
- Secondary or basement suites, which have no off-street parking access.
- Condos or apartments which either do not have assigned parking in the building, or who do not have authorized access to electricity for EV charging.

Since about 80% of EV charging takes place at home, access to home-based charging is critical to increasing the uptake of EVs. Several initiatives are helping address the problem.

- Curbside Charging Demonstration: BC Institute of Technology recently received funding from Natural Resources Canada to demonstrate low-cost curbside EV charging using existing street lighting infrastructure.
- EVCondo.ca: In 2016 Metro Vancouver launched EVCondo.ca. It walks EV owners, strata councils and property managers through typical steps in the process of setting up EV charging in an existing multi-family building. The website also contains a registry of EV-friendly strata buildings.
- Multi-Unit Residential Building (MURB) Charging Program: Rebates of 75% of total cost up to $4,500 per charging station were offered by the provincial government to purchase and install Level 2 charging stations in condominiums, apartments and townhomes. The program was so popular it was fully subscribed in under 4 months.
- EV charging in new buildings: In some municipalities developers of multi-family units are required or encouraged to provide EV charging infrastructure.
In August 2016, Metro Vancouver launched the Smart Drive Challenge. Participation was free and all eligible drivers were encouraged to apply.

201 residents were selected to participate and received a data logger. The loggers are small cellular devices that plug in to a port in your car – the same port your mechanic uses during a tune up – to track fuel consumption and vehicle movement in real time. They also recorded trips taken over the study period.

Each participant drove their vehicle normally, without feedback, for three weeks to establish their baseline. After this period, participants completed a half-hour on-line ‘Smart Drive Training’ course. The course describes how to drive more efficiently and make better trip choices that save fuel and reduce emissions.

For the final three weeks of the study, participants applied what they learned and were challenged to reduce their fuel consumption by 15%. Participants received daily email feedback and had access to detailed information online about their performance during this period. They could also see how their results stacked up against the rest of the study participants.

The Challenge will provide a better understanding of how ‘smart’, connected technologies can provide feedback to drivers that reduces fuel consumption and air emissions. Results will also help Metro Vancouver assess similar programs for future use.

With simple changes to driving habits, most drivers can save 10 to 15% on gas! Here are some tips to help.

- Avoid high speeds
- Go easy on the gas and brake pedals
- Be idle free
- Travel light
- Remove roof racks when not in use
- When it’s hot, roll down the windows at low speeds instead of using air conditioning
- Combine trips
- Use a fuel consumption display
- Keep your tires properly inflated
- Get regular tune ups

More information and tips can be found at www.smartdrivemetrovancouver.ca

One way to drive more smoothly is to imagine driving with a hot cup of coffee balanced on your dashboard.
Photo Contest

This selection of photos submitted for a Caring for the Air photo contest highlights striking scenes from around the region. The cover of Caring for the Air 2017 was submitted by Judy Robertson, who together with Maria Grace Santos-Ocampo, are the winners of the 2017 photo contest. Congratulations to Judy and Grace and thank you to all those who submitted photos.