

**Fair Sailing** is an initiative by the James Bay Neighbourhood Association (JBNA) to advocate for responsible cruise tourism practices that prioritize the interests of residents, local businesses and the environment of Victoria, Canada’s highest volume port-of-call.

James Bay residents want quality of life, clean air, no foreign garbage and a healthy safe community. The impacts of the cruise industry in our neighbourhood include overtourism, air pollution, the import of foreign garbage and threats to public health.

This section of **Fair Sailing** outlines air pollution studies in James Bay, international agreements, ongoing issues with emissions including particulate matter and greenhouse gases, and what conditions are needed for the introduction of shore power to ensure clean air.

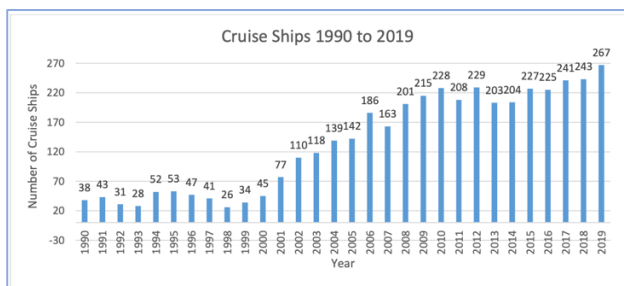
[www.fair-sailing.com](http://www.fair-sailing.com)

## Actions Needed

- Begin transition to 100% electric shore power in 2022 – to be funded without taxpayer subsidies
- Make use of electric shore power mandatory for all ships no later than 2024
- Maximum 3 ships per day
- Use only lowest sulphur Marine Fuel Oil within 12 nautical miles of Victoria

## 2006-2014 Studies and Analyses

By 2006, the rapid growth in the number and size of cruise ships had brought noxious emissions to the neighbourhood. The number of ships had increased from 45 in 2000, to 139 in 2004, and to 186 in 2006. The James Bay Neighbourhood Association (JBNA) realized that data was needed to support anecdotal evidence.



JBNA approached the Vancouver Island Health Authority (VIHA) about the impacts of air quality on our neighbourhood. VIHA initiated the James Bay Air Quality Study (JBAQS) to assess air quality in James Bay. The lead on this study, and subsequent analysis commissioned by BC Ministry of the Environment, was the Spatial Sciences Research Lab (SSRL), University of Victoria. JBAQS began with exploration of the area using samplers

while gathering meteorological information. The study team also looked back to 2006 air quality data gathered at the BC Ministry of the Environment Victoria Topaz Air Monitoring Station, located about 3.5 km from the ships.

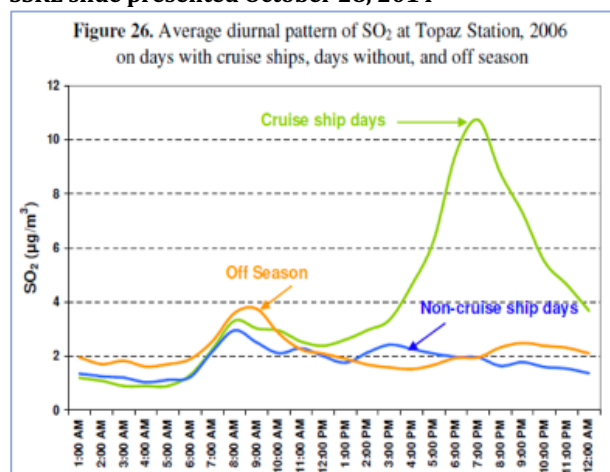
SSRL slide presented October 28, 2014



By isolating cruise ship days from other days, the JBAQS team was able to clearly show that in 2006 the most significant contributor to sulphur dioxide (SO<sub>2</sub>) in the region was cruise ships on days ships were in port. Nitrogen Dioxide (NO<sub>2</sub>) levels were also higher on cruise ship days when compared to

days with no cruise ship visits. Particulate matter and ozone levels were not markedly different at the Topaz station when ships were in port.

SSRL slide presented October 28, 2014



In late 2008, the JBAQS CALPUFF dispersion modelling was completed. SO2 levels, although elevated with ships in port, were not expected to be excessive or a significant health issue.

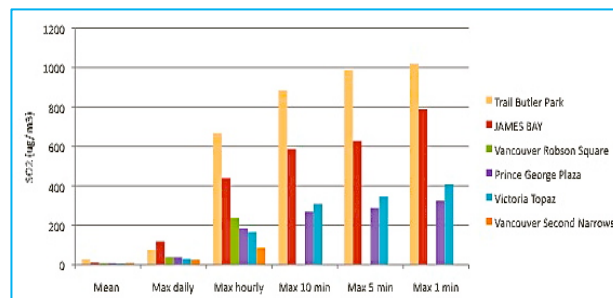
However, dark plumes and high odours remained visible when cruise ships were in port and residents in the path of the plume daily cleaned soot from their cars, decks and windows.

To obtain empirical evidence, the BC Ministry of the Environment placed a Mobile Air Monitoring Laboratory (MAML) on Dobinson Street, off Montreal Street, in James Bay in 2009.

SO2 levels were found to be triple what had been predicted by the JBAQS modelling study. The empirical data suggested a much higher sulphur content in the ship fuel than the industry provided value of 1.6%. Although NO2 levels were also elevated, they did not approach the upper

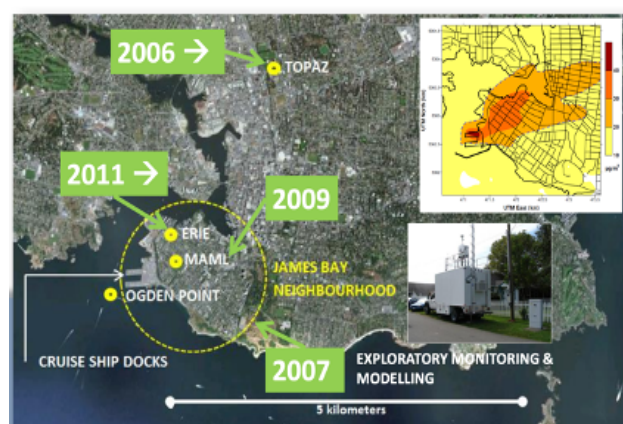
acceptable levels of NO2. Other compounds were at the levels predicted by the CALPUFF model.

MAML SO2 Results (June - August 2009)



SSRL slide presented October 28, 2014

The VIHA Health Assessment suggested 0.4-1.6 premature deaths could be attributable to the elevated levels of SO2. With urging from VIHA, a single SO2 monitor was placed in James Bay in 2011. Once the single SO2 monitor was placed in our neighbourhood, SO2 levels almost halved and the cruise lines moved the most polluting ships off the Alaska route.



SSRL slide presented October 28, 2014: dashed circle representing CALPUFF 'sampler' area; 2006/9/11 indicated locations of monitoring and CALPUFF dispersion schematic of SO2

## 2012-2020 International Agreements

2012 marked the implementation of the North American Emissions Control Area (ECA) agreement which required ships to reduce sulphur dioxide in emissions along the coastline. However, the agreement allowed for ships to employ other means of achieving low SO2 emissions including "averaging" or the use of exhaust gas cleaning systems - scrubbers. Rather than use more costly low sulphur fuel, most cruise-lines opted to use scrubbers, which remove harmful sulphur oxides from exhaust gases of heavy fuel oil.

In James Bay, SO2 emissions were lowered to acceptable levels by 2013, although there were a few incidents of high SO2. For example, on May 9, 2014, there was a particularly high level of SO2 during a

4-ship day. Cruise Lines International Association (CLIA) had advised against having 4 ships visit the port in one day. As of January, 2015, the ECA limit for sulphur in fuels was reduced to 0.1%.

Changes beyond the ECA areas have reduced SO<sub>2</sub> worldwide as new standards under the International Maritime Organization (IMO) came into effect. The IMO Maritime Pollution Convention (MARPOL) protocols lowered the global sulphur limit from 3.50% to 0.50% in fuel, effective from January 1, 2020.

Unfortunately, the use of scrubbers has created new negative environmental impacts. Studies over the past few years have identified significant pollution associated with scrubbers, with the wastewater effluents containing aromatic hydrocarbons and heavy metals. A 2020 study by the Swedish Environmental Research Institute showed ship particle emissions were higher by 41-64% with heavy fuel oil and scrubbers vs low sulphur marine fuel oil.

While the use of scrubbers is permitted, Environment and Climate Change Canada funded an analysis by the International Council on Clean Transportation in 2020. The report recommended an immediate prohibition on using scrubbers and warned of negative effects of scrubber discharges on marine life.

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## On-going Issues

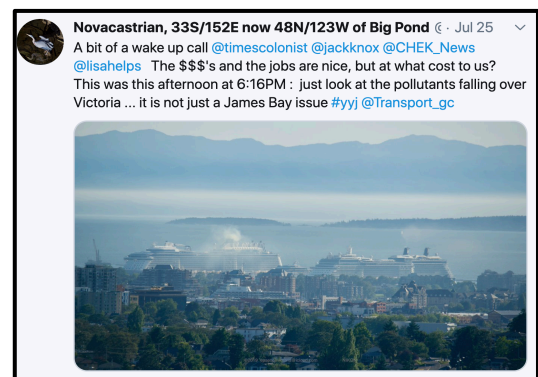
### Particulate Matter and NO<sub>x</sub>

As sulphur dioxide levels from cruise ships have been reduced to acceptable levels, other compounds are being emitted, especially greenhouse gases, particulate matter (black carbon), NO<sub>x</sub> and volatile organic compounds.

Locally, there is enhanced concern about particulate matter, both fine and ultrafine particulates. While scrubbers reduce large particulates, the higher levels of fine particulates are more of a health concern as ultrafine particulates more easily enter the lungs. A study by the Bloomberg School of Public Health, John Hopkins University, found that concentrations of particulate matter on cruise ship decks were comparable to concentrations measured in polluted cities, including Beijing and Santiago.

In addition to “black clouds”, James Bay residents have commented on orange and brown plumes. Residents with chemical sensitivities continued to report problems with other residual chemicals through 2019. In 2019, City of Victoria Mayor Helps spoke of “*clouds of black smoke billowing over the legislature*”. Emissions do not ‘stay’ in James Bay; they are dispersed across the region (albeit at lower levels).

Through property zoning, the City of Victoria shares responsibility with the Province and Federal governments for oversight of air quality.



Ogden Point’s zoning, M-2 Light Industrial District - Sections 1 & 1 (g), state: *1. The following uses are permitted, provided they are not noxious or offensive to the immediate neighbourhood or the general public by reason of emitting odours, dust, smoke, gas, noise, effluent or hazard: . . . (g) docks, wharves and piers.*

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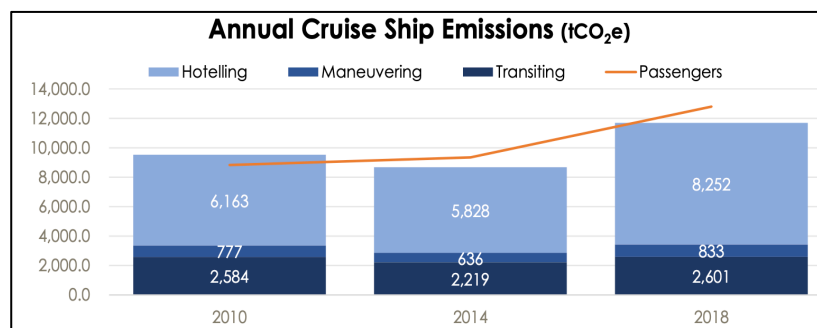
### A Local and Global Problem: Greenhouse Gas Emissions (GHG)

The shipping industry emits more than 1 billion tonnes of carbon dioxide (CO<sub>2</sub>)/year. 80% of the world’s goods are moved by sea. Shipping is an essential service. Cruise ships are not.

CO2 significantly affects climate change. GHG created during a typical 7-day cruise has been estimated as 0.82 tonnes CO2 equivalent (tCO2e) per passenger. This means that well over a million tons of GHG could be generated by cruise ships during the Seattle-Alaska season.

All levels of government in Canada have identified the reduction of greenhouse gas emissions as a priority.

Locally, Greater Victoria Harbour Authority (GVHA) commissioned Synergy Enterprises to conduct an Emissions Inventory study of greenhouse gas emissions created at the Ogden Point Deep-Water Terminal.



2018 GHG emissions:

Cruise increase ~ 7%/yr 2010-18

Cruise ships ~ 12,000 tCO<sub>2</sub>e

“Hotelling” ~ 8,252 tCO<sub>2</sub>e

vs

City of Victoria ~ 358,000 tCO<sub>2</sub>e

2019 GHG emissions:

Cruise for 6 months ~ 3-4 % City of Victoria yearly emissions

The Synergy Enterprises report shows that GHG cruise emissions have increased by 7% a year since 2010 and currently account for 3.3 % of the City’s annual GHG emissions. If the City is successful in reducing GHG emissions by 6% a year and cruise ship emissions continue to increase by 7% a year the cruise ship emissions could account for 7% of the City’s total by 2025.

Since 2014, California ports have made significant improvements in cruise and other ship emissions via the California Air Resources Board:

- Using shore power and shore scrubbers ship emissions have been reduced by 80% while at berth.
- Particulate and NOx emissions are being reduced on a regional level.
- No scrubbers are allowed in lieu of low sulphur marine fuel oil.
- Cruise cost for improvements are estimated at \$4.56 US per passenger.
- Monitoring and reporting of ship practices are ongoing and targets for further improvement are set for 2023 and 2031.
- Penalties are applied for not achieving requirements.

GHG emissions from shipping, and cruises ships, will remain an issue for many years, even as the shipping industry is moving forward and exploring other forms of energy, including electricity, next generation fuels and batteries. (Cruise and shipping emissions are considered “embedded” GHG. Victoria’s emissions from mobile sources are attributed to their port of origin to avoid double counting.)

### *An Interim Solution: Shore Power*

Shore power is a clean technology that enables ships fitted with the appropriate technical equipment to shut down auxiliary engines and connect to hydroelectric power while at berth, virtually eliminating air emissions and engine noise. Changes are also needed to reduce pollution entering and leaving port. This could include fuel type and docking methods.

The corporate responsibility for not polluting, lies with the cruise industry and GVHA, the landlord for the industry, as it owns Ogden Point.

There are three key conditions for shore power to be a local solution: ship capability, port mandate, and scheduling to maximize access/hook-up.

## **Ship Capability**

The 2019 Port of Seattle report shows that most cruise ships using their port have shore power capability. 100% of ships at terminal 91 hosting Holland America and Princess Line cruises were equipped to connect to shore power. It appears that most ships servicing the Alaska run (including Victoria) are capable of connecting to shore power.

## **Port Mandate**

Currently, the availability of shore power and the capability of ships to connect does not automatically lead to cruise ships using the service. The Port of Seattle reported a 89% connection rate in 2019. In Vancouver, which also has shore power, use has been limited – and declining. In 2018, only 70% of ships capable of connection used shore power, compared to 84% in 2015 and 77% in 2013.

## **Scheduling**

Previous shore power proposals considered by GVHA suggested an electric service connection at Pier B. This could service two ships, one on either side of the pier. Scheduling staggered arrivals and departures would facilitate hook-ups.

## **Financing**

GVHA's 2020 shore power feasibility report, authored by Moffat and Nichol, set a cost of about \$25 million to install shore power at two berths at Pier B. In 2010, GVHA introduced a cruise sustainability fee to fund capital expenditures for cruise infrastructure. As of 2019, this fee was \$2.30 per passenger while, by comparison, the 2019 Victoria's airport improvement fee was \$15/passenger.

Mayor Helps has suggested that any shore power should not be financed by the taxpayer.

A carbon tax could also be collected to change behaviour and fund port environmental improvements. Currently BC's carbon tax appears not to apply to marine gas oil. Rather than exempt the industry, the Province could be a leader, requiring the industry to pay a carbon tax on fuel taken on board in Vancouver and on fuel consumed while cruising the BC coast. As stated in the recent Supreme Court decision, Wagner's majority reasons: Para 16: *"By putting a price on GHG emissions, governments can incentivize individuals and businesses to change their behaviour so as to make more environmentally sustainable purchasing and consumption choices, to redirect their financial investments, and to reduce their GHG emissions by substituting carbon-intensive goods for low-GHG alternatives."*

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## **What Residents say**

*"Our quality of life is severely impacted. I recently moved from my house on South Turner St to Kingston/Oswego and was shocked at the distinct deterioration in air quality."*

*"Only those ships refitted with such equipment [shore power] should be allowed to anchor here and only if they solely use shore power."*

*"2020 was a blissful year without cruise ships in James Bay: it was peaceful and quiet; the air was clear and clean."*

*"Considering we live on Ontario Street, way more than 5 city blocks from the "gates of Ogden District", the fumes and bright lighting are highly noticeable."*

*"1) Reduce by half the number of cruise ships . . .  
2) Each ship must use shore power which will reduce pollution. All auxiliary diesel power must be shut down."*

*"I would be happy if Victoria never hosted another large cruise ship. Small cruise ships could be better if properly managed"*

*"A clarification of the neighbourhood position is the right start but, in the end, we must have legislation to require compliance. The City of Victoria seems to have little authority to act and no will to use what authority it does have in order to ameliorate the situation for James Bay and the surrounding area. .*