Transportation

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When it comes to meeting emissions targets, transportation is one of the areas that will need to undergo a transformation. The transportation industry, contributes 24.3% of Canada's total emissions, making it one of the largest carbon emitting industries in Canada (1). Within the transport sector, the largest greenhouse gas sources are freight trucks, light trucks, and commuter cars (2). There are several ways to go about mitigating the emissions associated with this sector. They include:

1. Investing in large scale transport.
Systems such as the GO transit system in Ontario can help to reduce the number of passenger cars and light trucks that are on the road by offering a more convenient way to travel (3). This could have huge benefits to the climate and to our way of travelling by lowering traffic congestion, increasing the efficiency of vehicles on the road, and reducing overall GHG emissions (4). For rural areas without similar public transport systems, a report commissioned by Transport Canada in 2009 suggested designing cyclist-friendly roads, and creating car-sharing incentives as methods to reduce automotive emissions in those communities (5).

2. Switching over to electric vehicles.
Advancing technology has allowed electric vehicles to become viable options for replacing GHG emitting, fossil-fuel powered vehicles (6). Currently, many Canadians find that zero- and low-emission vehicles are still too expensive to make this a realistic option, as of now (6).

From Practice to Policy

In May 2019, the Canadian Government implemented a Canada-wide zero-emission vehicle (ZEV) incentive, allowing vehicle-buyers to be eligible for a tax refund when they purchase a battery-electric, plug-in hybrid electric, or hydrogen fuel cell vehicle (7). Strategies such as this one can be an effective way to reduce emissions, while also reducing the cost for Canadians to own an EV (8).

3. Federal and Provincial government adding and enforcing emissions standards.
Programs such as the 'Drive Clean' program, which require vehicles to pass an emissions test in order to be considered safe to drive, can help to lower and limit the number of inefficient vehicles on the road, reducing GHG emissions (6,10, 8). It can also motivate car manufacturers to offer more efficient vehicles to buyers (8). Studies have shown that these programs are effective in high-polluting nations such as China (9). These studies have shown that while the amount of vehicles on the road is still increasing, emission control programs have caused a decline in GHG emissions since 2013 (9).

In Canada, both Ontario and British Columbia have removed these programs to focus on regulating heavy-duty diesel vehicles, citing significant improvements within the industry standards, leading to reduced emissions from passenger vehicles (10). However, vehicle emissions are still controlled by the Environmental Protection Act, which penalizes vehicles that produce excess emissions or have removed emission-controlling equipment (11).

REFERENCES

1. Environment and Climate Change Canada. (2019). National Inventory Report 1990–2017: Greenhouse gas sources and sinks in Canada. Government of Canada. Retrieved from http://publications.gc.ca/collections/collection_2019/eccc/En81-4-2017-2-eng.pdf

2. Environment and Climate Change Canada. (2019). Greenhouse gas emissions. Retrieved from https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions.html#DSM

3. GO Transit. Benefits of taking GO. Metrolinx. Retrieved from https://www.gotransit.com/en/about-us/benefits-of-taking

4. University of Ontario Institute of Technology: Faculty of Energy Systems and Nuclear Science. (2015). Exploring alternative transportation options in the Greater Toronto Area: Electric and natural gas vehicles. University of Ontario Institute of Technology. Retrieved from https://energyontario.ca/wp-content/uploads/2018/04/Alternative_Transportation_Options_UOIT_-_FINAL.pdf

5. Noxon Associates Limited. (2009). Improving Travel Options in Small and Rural Communities. Transport Canada. Retrieved from http://www.octn.ca/uploads/userfiles/files/Improving%20Travel%20Options%20in%20Small%20and%20Rural%20Communities%20Transport%20Canada%20April%202009.pdf

6. Clean Energy Canada. (2017). Stuck in neutral: Tracking the energy revolution 2017. Retrieved from https://cleanenergycanada.org/wp-content/uploads/2018/03/Report-EVs-2017-FINAL.pdf

7. Transport Canada. (2019). Zero-emission vehicles. Government of Canada. Retrieved from https://www.tc.gc.ca/en/services/road/innovative-technologies/zero-emission-vehicles.html

8. Levay, P.Z., Drossinos, Y., & Thiel, C. (2017). The effect of fiscal incentives on market penetration of electric vehicles: A pairwise comparison of total cost of ownership. Energy Policy. 105: 524-533. DOI: 10.1016/j.enpol.2017.02.054

9. Wu, Y., Zhang, S., Hao, J., Liu, H., Wu, X., Hu, J., Walsh, M.P., Wallington, T.J., Zhang K.M., & Stevanovic, S.(2016). On-road vehicle emissions and their control in China: A review and outlook. Science of the Total Environment. 574: 332-349. DOI: 10.1016/j.scitotenv.2016.09.040

10. Ontario Ministry of the Environment, Conservation and Parks. (2019). Mandatory emissions testing for older heavy-duty diesel vehicles. Government of Ontario. Retrieved from https://www.ontario.ca/page/mandatory-emissions-testing-for-older-heavy-duty-diesel-vehicles

11. Canadian Environmental Protection Act, 1999 (S.C. 1999, c. 33). Part 7, Division 5. Vehicle, Engine and Equipment Standards. Government of Canada. Retrieved from https://laws-lois.justice.gc.ca/eng/acts/c-15.31/page-23.html#h-65058