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5 STEP GUIDE TO GREENING
THE TRANSIT INDUSTRY AND REDUCING CANADA'S GHG EMISSIONS

(Credit: GO Transit)

There is perhaps no greater challenge to the modern world than that of climate change. Greenhouse Gases (GHG) like carbon dioxide (CO2), are being emitted at higher than ever levels, becoming trapped in the atmosphere and affecting global temperatures—leading to what is known as climate change.

In Canada, the burning of fossil fuels is one of the most significant sources of GHGs. According to Environment Canada, total national GHG emissions have risen 18 per cent, or 726 megatonnes of CO2 equivalent, above their 1990 levels. [1] This increase is largely attributed to the transportation industry, which contributes 23 per cent of Canada's total GHG emissions annually.

Transit can play a role at both the individual and industry level to help reduce GHG emissions. It can help reduce individual emissions through modal shift – encouraging people to move away from auto-congested roadways and high GHG-per-passenger modes of travel and towards greener, more sustainable methods of traveling from point A to point B.

At an industry level, transit systems must recognize that, while the industry may have a net positive impact on overall GHG emissions, it too emits GHG emissions, and must strive to green its operations even further.

A VISION OF SUSTAINABILITY IN TRANSIT

Transit Vision 2040 is an industry blueprint for the next generation of transit systems. Originally published in 2011 and renewed since, its many recommendations and targets are a challenge to the transit industry to keep greening and moving forward. Among the recommendations were that by the year 2020, all transit systems will have:

- Adopted vehicle acquisition and replacement strategies aimed at reducing greenhouse gases produced in their operations.
- An environmental management or green procurement policy in place, designed to reduce the impact of internal operations and facilities on the environment. Policies cover maintenance practices and materials, facility design and driver training programs aimed at improving fuel efficiency.

By the year 2040:

- The transit industry will aim to reduce transit fuel consumption to an average of 2 litres per 100 passenger kilometres and will produce no more than 4.9 kilograms of greenhouse gas emissions per 100 passenger kilometres.
- All transit facilities will be energy efficient. LEED certification is encouraged.

5 STEPS TO GREENING THE TRANSIT INDUSTRY AND REDUCING CANADA'S GHG EMISSIONS

1. ENCOURAGE TRANSIT ORIENTED DEVELOPMENT PRINCIPLES IN ALL NEW INFRASTRUCTURE PROJECTS
2. INCORPORATE EXISTING ALTERNATIVE PROPULSION TECHNOLOGIES INTO TRANSIT SYSTEMS THROUGH GREEN PROCUREMENT POLICIES
3. INVEST IN THE RESEARCH AND DEVELOPMENT OF GREEN TRANSIT TECHNOLOGIES
4. TRAIN TRANSIT OPERATORS TO REDUCE EMISSIONS THROUGH OPERATIONAL BEST PRACTICES AND STREAMLINING.
5. BUILD CLIMATE RESILIENT AND ENERGY EFFICIENT FIXED-INFRASTRUCTURE IN TRANSIT SYSTEMS

(Credit: Réseau de transport de la Capitale)

1. Encourage a modal shift through emphasizing Transit Oriented Development principles in all new infrastructure projects

The creation of Transit Oriented Developments (TODs) are key to creating efficient, popular and sustainable transit solutions for Canadians. It is also a major factor in encouraging a modal shift away from car dependency and towards transit use and active transportation.

This approach to development emphasises high density planning in close proximity to transit stations, transit priority measures within the community and rapid transit routes to employment centres.

The term "active transportation" refers to human powered transportation (walking, biking, etc.) and is often used in coordination with urban transit in TODs. Infrastructure that supports active transportation includes traffic calming measures, bike lanes, sidewalks and recreational trails.

According to the Victoria Transport Policy Institute, residents of TODs tend to own 15-30% fewer vehicles, drive 20-40% fewer annual miles, and will rely more on walking, cycling and public transit than they would in automobile-dependent communities.

Alternatively, when people live in non-TOD communities, they can find themselves dependant on their personal vehicles to commute to work and when traveling within their own communities.

2. Incorporate existing alternative propulsion technologies into transit systems through green procurement policies

On the market today there are a variety of technologies that, if incorporated into Canadian transit systems, would create an immediate and sizable reduction in transportation GHG emissions.

For example, alternative propulsion technologies for buses, such as Liquefied or Compressed Natural Gas (LNG/CNG), electric, clean diesel and hybrid technologies are proven to reduce emissions and often provide more comfortable, quieter rides for passengers.

Unfortunately, the high incremental cost of purchasing alternative propulsion buses, instead of standard diesel buses, creates a procurement barrier for transit systems unless an incentive is created by provincial or federal governments. The additional costs to build the appropriate supporting infrastructure, such as charging stations, for these new vehicles can also create a barrier to adaptiveness.

(Credit: New Flyer)

3. Invest in the Research and Development of green transit technologies

The implementation of existing green technologies alone is not enough to have a permanent and historic change on the transportation sector's GHG emissions.

Over the last decade, Canada's transit industry has been developing, integrating and leveraging new technologies and processes that could greatly help green the transit industry—from cutting-edge alternate propulsion technologies to light weight transit materials for improved fuel efficiency.

Unfortunately, the transit industry has limited involvement in government support programs for R&D. Key barriers for the industry include unwieldy application processes, the ineligibility of relevant activities and costs, and a lack of awareness of the importance of R&D in the transit industry.

(Credit: Toronto Transit Commission)

4. Train transit operators to reduce emissions through operational best practices and streamlining.

Not all GHG reducing initiatives need to be major projects. Small efficiencies can be found in transit operations, and, when taken together, can make major impacts on a system's overall emissions.

CUTA's SmartDRIVER training program teaches drivers to reduce their fuel consumption per trip and emit fewer emissions from exhaust. Driving techniques can have a 5 - 30% impact on fuel consumption, depending on the operator's driving habits (idling, acceleration and braking) and environmental conditions.

Also available to transit systems is training in maintenance and asset management, which helps transit systems not only keep their fleets running more effectively, but also ensures there's a cost effective plan in place to renew assets before they outlive their lifespans.

Vehicles that have outlived their recommended lifespans tend to emit more because they utilize older technologies and the wear and tear on the asset can cause it to run less efficiently.

The government can work with CUTA to help fund its training programs to ensure all transit systems and drivers across the country receive the necessary training to minimize their carbon footprint

(Credit: York Regional Transit)

5. Build climate resilient and energy efficient fixed-infrastructure in transit systems

There are many ways to implement energy efficient transit facilities to reduce the long-term costs and emissions from transit operations. Bus shelters, major transit stations, and operations facilities all present opportunities to maximize energy efficiency.

But the need for modern infrastructure goes beyond energy efficiency. Environment Canada has laid out a number of risks posed by climate change in Canada, including increased flooding and damage to infrastructure caused by extreme weather events. [2]

In order to ensure the safety and longevity of current and future transit operations, climate resilient infrastructure, that can withstand these extreme weather events, must be built into Canadian transit systems.

(Crédit: Société de transport de Montréal)

Province of Ontario

PAN ONTARIO ELECTRIC BUS DEMONSTRATION & INTEGRATION TRIAL STUDY

In 2014 the Canadian Urban Transit Research & Innovation Consortium (CUTRIC) was formed. It is the first Research & Innovation Network dedicated to transit and urban mobility.

One of CUTRIC's major projects will be a Pan Ontario Electric Bus Demonstration & Integration Trial Study. This electric bus demonstration project will:

(Credit: NovaBus)

- Place 25-35 electric buses on Ontario roads over the next 2 years.
- Integrate at least 7 transit systems across 5 or more electrical distribution jurisdictions.
- Incorporate more than one electric bus manufacturer.
- Integrate vehicles that require on-route charging as well as end-point charging.
- Predict and analyze the optimized usage of Ontario's Smart-Grid technology.
- Establish standard practices for the electrification of transit buses across Ontario and create "best practices" for electrification across Canada.

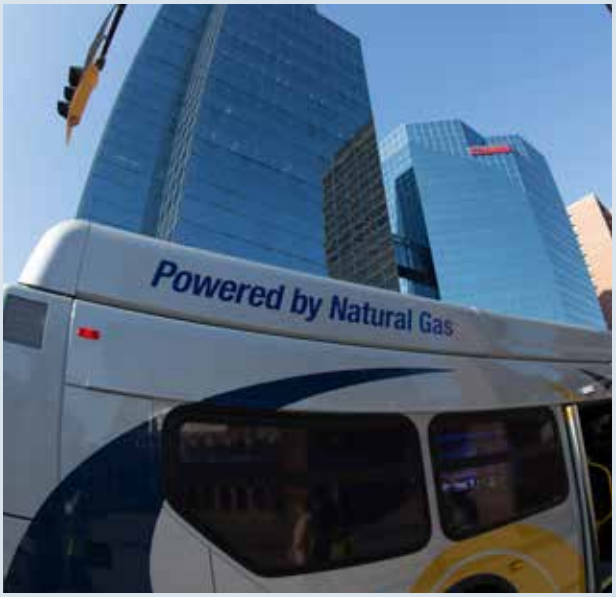
Hamilton, ON

HAMILTON STREET RAILWAY (HSR) AND CNG

In September of 2015, the City of Hamilton installed a new compressed natural gas (CNG) fuel station at the Mountain Transit Centre.

The new station built on the city's long history with CNG technology that goes back to the 1980s. With this new station, the city's capacity for natural gas buses will grow from 35 vehicles to 120 vehicles over the next six years. The projected cost savings of this initiative is about $40 million over the next 20 years while reducing GHG emissions by about 25 per cent – or 86 kilo-tons of CO2.This is equivalent to removing 18,105 passenger cars from the road.

The eighteen, 60-foot articulated CNG buses are the first of their kind in Canada. The city plans to replace about 18 buses per year with CNG until 2020. [3]



(Credit: City of Hamilton)

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1 "Greenhouse Gas Emissions." Environment and Climate Change Canada, 2016. <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=FBF8455E-1

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3 "City of Hamilton and Union Gas Partner to Grow Natural Gas Transit Fleet." Canadian Gas Association, 2016. <http%3A%2F%2Fwww.cga.ca%2Fnews_item%2Fcity-of-hamilton-and-union-gas-partner-to-grow-natural-gastransit-+fleet%2F>

The Canadian Urban Transit Association (CUTA) is the voice of Canada's public transit industry. For additional information including research reports, industry updates, news bulletins and more, please contact us or visit our website.

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