CLIMATE CHANGE IQ

A SERIES OF BACKGROUNDERS

Greener transportation

PART 2

Personal transportation and fuel efficient vehicles

GREENHOUSE GAS (GHG) EMISSIONS are a major contributor to climate change. Transportation in Canada is a major contributor to our GHG emissions – measuring 26% or more of our GHG emissions, according to Statistics Canada. Worse still, Canadian transportation emissions are expected to rise as more people come to own cars and drive them further.

Therefore, any serious plan to lessen the damage and dangers of climate change must include strategies to reduce the GHG emissions due to transportation.

To find the best solution we need to critically examine our options. The National Union has chosen to explore three areas crucial to the transportation puzzle:

1) Biofuels: the good and bad;
2) Personal Transportation and Fuel Efficient Vehicles; and
3) Public Transportation and Policy.

PART TWO

PERSONAL TRANSPORTATION AND FUEL EFFICIENT VEHICLES

THE PROBLEM

More Cars

According to Statistics Canada, our country has more kilometres of roadway per person than almost any other nation. We love our cars and the freedom we perceive ourselves to have behind the wheel – with the wide open road ahead of us. Since the 1950s car ownership has grown from five people per vehicle to less than two people per vehicle.[1] Not only are there more personal vehicles on the road but now there are bigger vehicles on the road.

Bigger Cars

From 2000-2005 the number of pick-up trucks and SUVs on Canada's roads grew by more than one-quarter, while the number of cars and station wagons fell by 1%. These four types of vehicles, pick-up trucks, SUVs, cars and station wagons are collectively termed light vehicles. In 2005, 18 million light vehicles were on the road and more than 40% of them were SUVs and pick-ups (light trucks).[2]

Bigger Emissions

Canada ranks near the top in per capita use of fossil fuels and GHG emissions. Our love or addiction to the personal vehicle is a significant portion of our GHG emissions and the global problem of climate change. Transportation accounts for 26% of total GHG emissions in Canada.[3] Most significantly, emissions in this sector have grown 28% since 1990, making our attempts to decrease our emissions to 6% below 1990 levels, in keeping with our Kyoto commitment, all the more difficult.

Vehicle type	Average fuel efficiency	Kilograms of CO_2	1 tonne of CO_2 every...
Cars	9.1 L / 100 km	21.6 kg / 100 km	4,630 km
Pick-up trucks	14 L / 100 km	33.3 kg / 100 km	3,003 km
Vans	11.5 L / 100 km	27.3 kg / 100 km	3,663 km

To better understand the emission impact of the transportation sector, chart 1 includes a breakdown of emission sources and compares 1990 to 2004. For example emission from cars decreased steadily from 1990 levels up to 2004 and are presumably still decreasing somewhat. Fuel efficiency has significantly contributed to this reduction, since car sales have only fallen 1% between 2000-2005. Conversely light truck emission have steadily risen, as have heavier duty vehicles. Light trucks' continued fuel inefficiency, combined with the increase in popularity of these vehicles, has led to an overall increase in transportation emissions in Canada.

Our kilometres driven has doubled since 1960
David Suzuki Foundation

SOLUTIONS TO LIGHT VEHICLE EMISSIONS

Various recipes have been offered to aid in the reduction of emissions caused by our transportation habits. Canada is a big country and we still need to move ourselves, goods, and resources between and within provinces. So a plan outlining how to meet significant reductions is essential.

Fuel Efficiency

The #1 most commonly recommended solution, endorsed by the David Suzuki Foundation, the Pembina Institute, the Sierra Club of Canada, the Canadian Autoworkers Union and more, is to improve fuel efficiency in all vehicles. The technology is here today and can be implemented in all new vehicles.

But how much of an improvement do we need?

Britain is aiming for average vehicle carbon emissions that are half what our vehicles currently emit (see table 1). Vermont and

nine other US states are calling for a 30% reduction in CO_2 emissions from cars for 2009. North American car companies argue that it could take 12 years to develop a model that meets these standards, yet others claim the technologies exist today that can lower mini van emission by 40%. A US Senate committee has recently approved a Bill to make auto manufacturers improve fuel efficiency of vehicles by 4% annually starting in 2011. The result would be an efficiency improvement from 9.4 litres/100 km to 6.7 litres/100 km by 2020.[4]

In Ontario, Premier McGuinty asserts that Ontario can't afford to set their own tough emission standards. He challenges the federal government to provide consistency across the country, rather than a "hodgepodge of standards".

The US has Corporate Average Fuel Economy (CAFE) standards that have, since the mid-1970s, influenced vehicle manufacturers throughout North America. This standard has been effective at reducing oil consumption and harmful emissions in the past, but has not been strengthened for decades. Canada's own CAFE standards are now needed! These mandatory standards will go a long way to move us towards our Kyoto goals and beyond in the crucial decades to come.

> "In light of the power of the automotive lobby, the federal government must make negotiations with auto-makers transparent. The federal government should facilitate a public stakeholder process including labour, industry, public interest organisations and local governments to determine and re-evaluate the Canadian CAFE standard on an ongoing basis.
>
> "It is essential that the vehicles of the future - fuel-efficient vehicles - be built here in Canada.
>
> "The federal government must develop proactive policies to ensure that the fuel efficient vehicles of the future are built here in Canada, encouraging Canadian-based research into fuel-efficiency technologies and tying subsidies for any new car assembly plants to the production of more fuel efficient vehicles. The federal government should also help the industry through incentives to get more fuel-efficient vehicles on the road."[5]

To date the federal government has made no solid commitment of standards but has only said it "will regulate the fuel efficiency of cars and light duty trucks, beginning with the 2011 model year. Our rules or regulations will be based on a stringent, dominant North American standard. We intend to work in close collaboration with the United States to pursue a Clean Auto Pact that would establish an environmentally ambitious North American regulatory standard for such vehicles."[6]

Choosing a Car

When choosing a car with the lowest GHG emissions there are a number of aspects to consider for your new vehicle:

- fuel efficiency (the number of km/L of fuel)
- the type of fuel required to run it
- the source of that fuel
- total "cradle to grave" energy consumption and waste created.

Every auto manufacturer has a solution on the market. This tells us they're getting the message. But most manufacturers are lagging in the mass production of low – zero emission vehicles. Some examples of vehicle types are:

- *Flex-fuel vehicles* – those that specialize in performing with the use of biofuels and biofuel blends. There are problems with the environmental integrity of biofuels, in some cases there are greater GHG emissions during the production of the fuel *(see Greener transportation: Part 1)*.

- *Hybrids* – vehicles that switch between functioning with an electric motor and an internal combustion engine. Driving or braking recharges the batteries for the electric motor functioning. These vary greatly in their design and should be ultimately judged on their fuel efficiency rating when purchasing for low emissions. They use fossil fuels, but can run on biofuels as well.

- *Plug-in Hybrids* – are still predominately concept vehicles but will soon be in the market place. They are designed to get the most out of the electric motor, by allowing the battery to be charged through plugging the car into a standard outlet overnight or during lunch hours. It is

important to understand that the power coming from your outlet was created somewhere and may have GHG emissions of its own. Renewable energy sources like wind, small hydro and solar are the most sustainable.

- *Electric Vehicles (EVs)* – are predominately concept vehicles for the large auto manufacturers. However, a handful of smaller manufacturers have mass produced their own unique versions. New technologies have allowed lithium batteries to charge 10X faster and have improved the performance of electric vehicles. Bringing the price down for these newer technologies is still the challenge to making electric and plug-in hybrids a mass solution. When recharging EVs at a standard outlet, the electricity source is to be considered part of the GHG price tag. Without renewable power sources there will be GHG emissions connected to your driving. Small community vehicles (CVs) offer an alternative to the common car for moving around communities with zero tailpipe emissions and low noise. Unfortunately Canadian communities have a number of barriers to electric vehicles some of which are:
  1. Electric motorcycles are not permitted on Ontario controlled access highways,
  2. LSVs (low speed vehicles) are not permitted on public roads in 9 out of 10 provinces,
  3. Canadian electric utilities are not allowed to promote electric vehicles.

- *Hydrogen (H) powered vehicles* – are predominately concept vehicles. Several major manufacturers have indicated that mass production is on the horizon, but the infrastructure for hydrogen is lagging. Similar to plug-in hybrids and electric vehicles, the source of the power used to produce H-fuel-cells or H itself is a consideration.

The final consideration for vehicle purchasing is the cradle to grave analysis. How energy efficient is the plant where your car was made? Are employees treated fairly and have safe working conditions? How far does your vehicle have to be shipped to get to your market? Are there hazardous

materials in your vehicle? Are the parts recyclable at the end of the car's life? Assessing all our consumption habits in this way will help move us to a sustainable future.

These are all important questions but generally very difficult for the average consumer to assess. What we can do is ask these questions of the manufacturer when purchasing a vehicle. Challenge their knowledge of the product and let them know that as a consumer these issues are important to you.

Although efficient light vehicles can go a long way to cutting back on our transportation emissions, not all of us are in a position to replace our current vehicle. Incentives like rebates have been shown to have little impact on consumer buying habits and certainly wouldn't significantly reduce the costs of a state-of-the-art low or zero emission vehicle.



Driving Differently

No matter what vehicle you're driving you can get improved fuel efficiency by changing your driving habits. The website www.fueleconomy.gov outlines a few tips that can save you dollars and GHG emissions. Combined these changes in habits can improve your fuel efficiency anywhere from 13%-58%.

- Avoid rapid starting and stopping
- Don't speed
- Remove excess weight from your vehicle
- Use the cruise control to maintain a constant speed
- Don't idle
- Use the overdrive gears to slow down the engine.

Keep your car in peak condition to get the maximum fuel efficiency it was designed for. Combined, these actions can improve your vehicle's performance up to 20%.

- Get a tune-up regularly
- Check and replace air filters
- Keep tires inflated to the recommended level
- Use the recommended grade of motor oil

TRANSPORTATION PLANNING AND TRAFFIC MANAGEMENT

Breaking our Addiction to the Personal Vehicle

> "If we build a freeway system or an extended airport system to meet some prediction of future demand, then we should not be surprised to discover that these investments hasten our progress in that direction. Our plans and analyses boomerang so that our efforts are rewarded by the return of the problem, usually with some force and destructive impact."

All our efforts to solve transportation problems have simply led us to bigger transportation problems.

Roseland, in his 2005 edition of "Toward Sustainable Communities", notes that 88% of North American daily commuters use private vehicles, leaving less than 5% who take public transit.

This use of cars will not only lead to GHG emissions from each vehicle on the road, but will carry with it all the other impacts of driving: personal costs of thousands of dollars a year, crashes, noise, time stuck in traffic, run-off into waterways, pollution from manufacturing vehicles, tires, batteries, and pollution from disposing of them, to name a few. Fewer cars on the road is the answer. But a comprehensive approach needs to be taken to realize this future.

What is it that communities, government and city planners can do to discourage personal car use and encourage alternative types of commuting? Transportation Demand Management (TDM) looks for the best solutions to transportation problems by creatively managing the systems we have in place, with a series of sustainable development objectives in mind. The technological solutions may or may not arrive, but we can restructure our communities now to encourage transportation solutions that have multiple benefits and discourage the personal vehicle that has multiple drawbacks.

When Walking is Pleasant

To make walking a more attractive or practical option we

Why Los Angeles still has smog

It is no wonder that Los Angeles still has smog more than 30 years after the battle to reduce it first began - the battle has concentrated on making vehicles cleaner and more efficient, it has done nothing to make them less needed. The principle that is often forgotten here is the Jevons principle. The Jevons principle was first enunciated in 1865 when an assessment was made that improving U.K. coal-burning efficiency would save coal - Jevons predicted that it would lead to more economic uses for coal. The same principle seems to apply to our present assessment of transportation fuel use. The price mechanism and urban sprawl ensure that for every increase in technological efficiency there is a rapid increase in the use of vehicles.
(Newman, P. 1996. Reducing Automobile Dependence. Presented to OEDC International conference, Toward Sustainable Transportation, Vancouver, B.C., March.)

need to understand some of the reasons why people would choose to drive a walkable distance. With changes to sidewalks and cross-walks the City of Vancouver was able to construct a Wellness Walkway that incorporates ideas for enhancing accessibility throughout the community for those with sight and mobility challenges. Increasing urban density has been shown to reduce the need for cars and motivate walking. So when cities are developed or sectors redeveloped, mixed land uses will help with increasing density – bringing work, groceries, schools and recreation closer to home.

When Cycling is Safe

Bikes are ideal vehicles for congested urban centres, demanding less space. Toronto, Ontario studies show that when cycling facilities are improved, cycling trips increase. Cycling routes can be more direct when sharing roadways. Designated lanes provide greater safety for bikes. Sheltered bike parking allows for secure all season riding. Workplaces with showers and change rooms for cycling employees, instead of parking lots, would encourage workers to leave the car at home.

What is Commuter Challenge?

Commuter Challenge is a national program that aims to increase the awareness of the benefits of sustainable commuting and to encourage Canadians to take action by walking, cycling, taking transit, carpooling or teleworking instead of driving alone to get to work.

Roadway management

Some planners incorporate high occupancy vehicle (HOV) lanes on major roadways, where vehicles with 2+ or 3+ occupants have access to a faster lane for speedy rush-hour travel. HOV preferred parking is a further incentive for car pooling. Even better are designated transit lanes for buses, since buses can hold considerably more individuals. One full bus can hold as many people as a kilometre of car-pool traffic. Designated lanes will have some threshold of efficacy since, as more HOVs occupy the roads and fill their designated lanes, the speed advantage will diminish. Other creative management strategies may be applied as these shifts occur with the aim of favouring vehicles carrying more occupants.

Disincentives for car use include toll roadways, paid parking, car-free areas like pedestrian malls. Traffic calming on local streets can eliminate a speed advantage for those short trips, making cycling or walking preferable.

Public transit services

A transit system that is rapid and cheap will displace car drivers. Bus and city rail system designs that integrate transit routes with the city business development plans are the most successful. Key transit enhancements proposed by the David Suzuki Foundation in "The Bottom Line of Kyoto", for the largest metropolitan areas (Toronto, Vancouver and Montreal) include aiming for ten-minute reduction in vehicle travel time and a five-minute reduction in other urban areas. Other infrastructure improvements include the addition of light rail, commuter rail and designated bus lanes.

Personal incentives of tax exemption for transit passes was implemented last year by the federal government. Several urban transit systems provide an "eco-pass" option for employers to offer as a benefit to employees. These annual passes are discounted and are proven effective at encouraging commuters to switch to transit.

The Electronic Cottage

Telecommuting uses advances in telecommunications which enables employees to work away from the office. This strategy may have the potential to reduce daily commutes, but some observations have shown that more driving may occur in an effort to meet work needs that would all be accessible in the office (postal services, copying, supplies, etc.). Employees might also be encouraged with telecommuting to live a long way from work leading to greater urban sprawl. With these points in mind telecommuting is only part of the formula to reduce car use.

TAKE ACTION TODAY

Many options exist for each and every one of us to do better. A detailed plan of how city, provincial and federal governments can affect change can be tackled with existing systems and technology. No one need wait for a better car or a new technology; changes can be made today in how we manage our transportation systems and attitudes about personal travel.

Each workplace can adopt transportation priorities. Ideas like "Green Provisions" in our Collective Agreements regarding transportation benefits, or participation in community *commuter challenges* and *car free day* will raise awareness at work and in the community about the full impact of transportation on climate change, our immediate environment and our health.

NOTES

1 "Human Activity and the Environment: Annual Statistics 2006, Feature Article: Transportation in Canada. Statistics Canada, Catalogue no. 16-201-XPE.
2 ibid
3 ibid
4 "US panel OKs tougher fuel-efficiency standards", May 8, 2007, CBC News.
5 Sierra Club of Canada National Office: http://www.sierraclub.ca/national/programs/atmosphere-energy/climate-change/cafe-backgrounder.shtml
6 Environment Canada web site: http://www.ec.gc.ca/default.asp?lang=En&xml=A1AD0C92-1456-4D5D-A5B5-9CA9BB684B44