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Ref.:	RCCOW2016-MetroTransit
To:	**Halifax Regional Council Committee of the Whole**
From:	S. M. Mandaville Post-Grad Dips. Chairman and Scientific Director
Date:	April 08, 2016
Subject:	Halifax Transit Moving Forward Together Plan-April 12, 2016 agenda

Dear Mr. Mayor and Councillors: We respectfully suggest that Halifax carry out an intensive publicity campaign to encourage more residents avail themselves of public transit, if available in their neighbourhood. In addition, make major revisions to the Transit proposal to include more areas as well as raise the frequency to greatly increase public use. Otherwise, the public will use their autos rather than public transit.

Fundamentally, there are two (2) prime reasons for our suggestions:-

(1) Doing the public's part in reducing greenhouse gas emissions in accord with international agreements; we herewith insert a summary analysis of a study by the Conference Board of Canada as reported by the CBC, and

(2) Heavy vehicular traffic may have direct impact on lake water quality due to runoff from street surfaces reaching lakes via storm sewers or drainage ditches. The local municipal units have never treated these flows. The concentrations we measured in a few example areas in Halifax were lower than those reported in the USA. Nevertheless, they may still have impact on the biota of the lake bottom sediments, and may result in long term cumulative impacts.

[#1] Low-carbon future means driving less, Conference Board says:

(Excerpts from the CBC News Posted: Nov 12, 2015)

"New zero-emissions cars and gains in fuel efficiency won't be enough for Canada to meet climate change targets for road transport, a Conference Board of Canada study says.

Instead, Canadians will have to change their habits to drive less and governments will have to encourage people to use more sustainable forms of transportation.

Transportation emissions account for about 28 per cent of total greenhouse gas emissions in Canada, with the majority coming from road transport, including light passenger vehicles and freight trucks. Total emissions have risen since 1990.

An 80 per cent reduction in Canada's road transportation emissions by 2050 would require a reduction of approximately 117.5 million tonnes of carbon dioxide-equivalent emissions from 2013 levels.

"To achieve the 80-by-50 target, Canada will need to implement a co-ordinated approach that, in addition to focusing on technological improvements, includes initiatives that reduce demand for road transportation," the Conference Board report says.

Fuel efficiency not enough

But as the carbon intensity of vehicles has decreased, Canadians are driving more and opting for larger vehicles such as SUVs and pickup trucks. In addition, a growing economy and population means more vehicles on the roads.

Even new technologies, such as biofuels, compressed-gas-powered vehicles, hydrogen, electric and hybrids won't bring Canada in range of its emissions targets, the report says.

But the toughest challenge will be to get Canadians to give up their love affair with the car. The reports recommends everyone try to drive less and shift to public transit, cycling or walking.

Challenge to change habits

Those kinds of changes mean expensive investment in infrastructure such as improving public transit, but also in making urban areas safer for pedestrians and cyclists. It also demands that people live closer to where they work.

The burden of that kind of urban planning will fall to cities, and some have already begun setting targets. For example, Vancouver plans to have half of all trips on foot, bike or transit by 2020."

[#2] A representative selection from published literature:-

Common road runoff pollutants and sources (some pollutant concentrations below may have been reduced/eliminated now due to North American regulations):

Kobringer, *et al.*, 1984. Volume I. Sources and Migration of Highway Runoff Pollutants- Executive Summary. Federal Highway Administration, Rexnord, Milwaukee, WI.

Constituent	Primary Sources
Particulates	Pavement wear, vehicles, atmosphere, maintenance, snow/ice abrasives, sediment disturbance
Nitrogen, Phosphorus	Atmosphere, roadside fertiliser use, sediments
Lead	Leaded gasoline, tire wear, lubricating oil and grease, bearing wear, atmospheric fallout
Zinc	Tire wear, motor oil, grease
Iron	Auto body rust, steel highway structures, engine parts
Copper	Metal plating, bearing wear, engine parts, brake lining wear, fungicides and insecticides use
Cadmium	Tire wear, insecticide application

Chromium	Metal plating, engine parts, brake lining wear
Nickel	Diesel fuel and gasoline, lubricating oil, metal plating, brake lining wear, asphalt paving
Manganese	Engine parts
Bromide	Exhaust
Cyanide	Anticake compound used to keep deicing salt granular
Sodium, Calcium	De-icing slats, grease
Chloride	De-icing salts
Sulphate	Roadway beds, fuel, de-icing salts
Petroleum	Spills, leaks, blow-by motor lubricants, antifreeze, hydraulic fluids, asphalt surface leachate
PCBs, pesticides	Spraying of highway right of ways, atmospheric deposition, PCB catalyst in synthetic tires
Pathogenic bacteria	Soil litter, bird droppings, trucks hauling livestock/stockyard waste
Rubber	Tire wear
Asbestos*	Clutch and brake lining wear

Mean pollutant concentrations (µg/l) in runoff from urban and rural highways sources (some pollutant concentrations below may have been reduced now due to North American regulations):

Driscoll *et al.*, 1990. Pollutant Loadings and Impacts from Highway Stormwater Runoff. Volumes I-IV. Federal Highway Administration, Oakland, CA

Pollutant	**Urban (ADT> 30,000)**	**Rural (ADT< 30,000)**
	(µg/l)	**(µg/l)**
TSS (Total Suspended Solids)	142,000	41,000
VSS (Volatile Suspended Solids)	39,000	12,000
TOC (Total Organic Carbon)	25,000	8,000
COD (Chemical Oxygen Demand)	114,000	49,000
NO_3/NO_2 (Nitrate + Nitrite)	760	570
TKN (Total Kjeldahl Nitrogen)	1,830	870
Phosphorus as PO_4	400	160
Cu (Total Copper)	54	22
Pb (Total Lead)	400	80
Zn (Total Zinc)	329	80