Task Force on Vehicle Weights and Dimensions Policy
Government/Industry Meeting
Monday, November 20, 2006

Agenda Item # 4 - Environmental Stewardship and Equipment Design

Introduction

The Canadian Trucking Alliance (CTA) is a federation of Canada's provincial and regional trucking associations who collectively represent more than 4,500 motor carriers. CTA has a long history of promoting effective and practical measures for reducing emissions from freight transportation. CTA has served, or continues to serve, on Transport Canada's Transportation Table on Climate Change and its National Advisory Group for the Development of a Sustainable Transportation Strategy. CTA is partner to a memorandum of understanding (MOU) with Natural Resources Canada (NRCAN) to jointly explore ways to reduce emissions from trucking. CTA sits on the Board of Directors of the Office of Energy Efficiency. CTA is a promoter of the US Environmental Protection Agency's (USEPA) *Smartway* Program, an initiative designed to encourage shippers and manufacturers to utilize the services of environmentally sensitive freight transportation providers. CTA also played a key role in the development of the USEPA's model regulation on anti-idling. And, CTA helped to bring NRCAN and USEPA together in an MOU on information sharing.

Purpose

This overview highlights some of the environmental opportunities and challenges of the trucking industry. It also provides a comprehensive set of practical measures designed to reduce both smog emissions and the production of greenhouse gases (GHG's) from and by trucking. The relationship between transportation and the environment is very complex. Freight transportation, including trucking, is a derived demand industry. The demand for transportation fuel, including truck diesel fuel, and the resulting emissions of air pollutants (smog) and GHG's (climate change) is a function of many factors – economic activity, vehicle technology, driver behaviour, infrastructure, geography, weather, fuel costs, etc. – all of which combine to make decisions as to how to reduce emissions from the sector very challenging.

Jurisdiction over Transportation & the Environment

In the Canadian trucking industry, the regulatory governance over trucking and the environment is more complex than that experienced by most other industries, reflecting the fact that the regulation of extraprovincial trucking is a shared responsibility between the federal government and the provinces. So too with regard to environmental regulation, where in addition to the federal and provincial governments, municipal governments also have an important role to play. Even with the federal government, several departments lay claim to some aspect of jurisdiction over transportation and the environment – Environment Canada, Transport Canada, Natural Resources Canada and the Department of Finance.

The Trucking Industry

The Canadian trucking industry is the backbone of commercial transportation in Canada, providing flexible, time sensitive services that allow Canadian manufacturers to compete in the North American marketplace. Trucks presently dominate the freight distribution marketplace, handling 90% of all consumer products and foodstuffs and two-thirds (by value) of Canada's trade with the United States. It is a very diverse industry, made up of a few large companies, but dominated by small and medium sized businesses and independent owner-operators, employing somewhere in the order of 400,000 people overall. The industry consumes about 8.8 billion litres of diesel fuel per year in its 600,000 vehicles. Class 8 trucks (those weighing more than 15,000 kg) or the typical tractor-trailer unit account for 277,000 vehicles.

Trucking & the Environment

Trucks, like all modes of transportation rely on hydrocarbon-based fossil fuels for motive energy and to heat or cool the cabs. And, since trucking is the dominant mode of freight transportation, the industry does produce emissions:

- **Greenhouse Gas --** According to Transport Canada's Transportation Annual Report 2005, GHG levels for on-road freight increased by 60% between 1990 and 2003. However, the report cautions that this increase should be viewed in the context of a rise of 120% in freight activity levels during the same period, indicating that *"while (on-road) freight is accounting for increasing levels of GHG …it is also becoming more efficient by decoupling GHG emissions from activity. This has been achieved in a number of ways, including the adoption of better operating practices and the use of more efficient equipment."*

- **Air Pollution --** The most visible impact of air pollution emissions is smog, which is composed of two main ingredients – (1) ground level ozone which is created when nitrous oxides (NOx) and volatile organic compounds (VOC's) react together, and (2) particulate matter (PM). Since 1990, the trend in the emission of these pollutants has been downward, reflecting major advances in engine and fuel technology and regulated emission standards.

The trucking industry has a good story to tell. Over the years, it has greatly improved its fuel efficiency performance. In the fall of 2006, a new generation of smog-free truck engines and ultra-low sulphur diesel fuel has been introduced by law into the marketplace. This is in comparison to the other freight modes who receive no regulatory control over their engine emissions and limited, in comparison to trucking, oversight regarding the sulphur content of their fuel. However, with regards to the trucking industry, CTA believes there are further opportunities to be had and challenges that can be overcome by industry and government working together.

CTA has proposed a series of measures which it feels should be incorporated by governments and industry. Some of these measures deal directly with weights and dimensions.

Environmental Benefits of CTA Proposals						
CTA Proposed Measures	Annual Reductions Per Truck[2]			Total Annual Reductions (Canada)		
	N0x (Kg.)	PM (kg)	GHG (tonnes)	N0x (kg. millions)	PM (kg. millions)	GHG (tonnes, millions)
Smog Free Trucks[3]	817	33	-	28.6	1.2	-
Anti-Idling Devices	134	2	19	37.5	.560	5.3
Reduce/Control Truck Speeds	195	4	10	54.6	1.1	2.8
Wide-Base Tires	28	0.6	4	7.8	.168	1.1
Aerodynamic Improvements	42	0.9	5	11.8	.252	1.4
Expanded LVC Network[1]				1.7	.04	.3
Total Reductions	399	7.5	38	142	3.32	10.6
Equivalent # of Trucks Removed from Air Quality Perspective				90,967	100,606	45,638

[1] Preliminary data from a pending joint NRCAN/CTA study for Ontario only based on an expanded network between Quebec & Ontario. The final study will also show GHG savings from Western and Maritime Canada LVC network.
[2] The calculations used to create the emission savings were generated from USEPA emission factors for Class 8, pre-October 2002 trucks.
[3] Based on sales of 35,000 Class 8 2010 model year trucks.

Combined CTA's proposed measures would contribute to a:

- 142 million kg reduction in NOx emissions or the equivalent of impact of removing almost 90,000 pre-October 2002 model year trucks;
- 3.3 million kg reduction in PM emissions or the equivalent impact of removing over 100,000 pre-October 2002 model year trucks;
- 10.6 million metric tonne reduction in GHG emissions or the equivalent impact of removing over 45,000 trucks.

Specific to pollutant and GHG emission reductions and vehicle weights and dimensions there are a number of issues that the provinces and territories can address that would allow the trucking industry to further reduce its emissions. The specific issues related to weights and dimensions are addressed within the following pages. It should be noted that while some of the issues are included in the reduction calculations above, others are not.

1. Auxiliary Heating/Cooling Systems to Eliminate Truck Idling

The primary cause of idling in long-haul trucks is cab comfort, heating and/or cooling, when the driver is resting or sleeping in the vehicle. Long-haul trucks can often idle at least six hours per day, or 1,830 hours per year. Several auxiliary power unit (APU) technologies are available that can reduce idling by as much as 90%. The USEPA estimates that fuel savings of up to 7,200 litres per year – which would translate into a GHG emissions reduction of 19 metric tonnes, 2.8 kilograms of PM and more than 134 kilograms of NOx .

The successful NRCAN Commercial Transportation Energy Efficiency Rebate program was suspended in March 2006 even though the rebate program encouraged the purchase of 13,280 APU's which eliminated on average, 2,200 idling hours per year per truck. This contributed to reductions of about 186,000 tonnes of GHG, more than 47 million grams of PM and more than 4.5 billion grams of NOx.

However, the weight of an APU can be as much as 181 kg (400 lbs.), which for many trucks eats directly into their allowable payload and therefore efficiency. A report from the US Department of Energy's Argonne Laboratories found that a trucking company's overall revenue could be reduced by as much 0.6% by having to cut payload to accommodate APU's. In response, the US, in its last Energy Bill provided a 400 lb exemption. Canada should follow suit.

The provinces and territories should provide a weight exemption of up to 181 kg. (400 lbs) for trucks equipped with an APU. To alleviate any concerns regarding abuse of this allowance carriers would have to prove to weight compliance officials that a truck's idle reduction technology is fully functional and that the 400-lb gross weight allowance is not used for any other purpose.

2. 2007-2010 Truck Engine Technology

Emissions from truck engines have been regulated for over 30 years by Environment Canada (EC) and the US Environmental Protection Agency (USEPA). The 2007 model year truck engines (which enter the market this fall) will usher in the era of the smog-free truck by virtually eliminating emissions of particulate matter (PM) and nitrous oxides (NO_x). A 90% reduction in PM is mandated for the 2007 trucks. By the 2010 model year, NO_x emissions must be reduced by 95%. If the Canadian trucking fleet was composed exclusively of 2007 engine technology, the air quality impact would be the equivalent of removing more than 90% of today's trucks from the roads.

Concerns over the payload penalties associated with the new equipment have contributed to a "pre-buy" mentality, which will delay the penetration of the new vehicles and delay the environmental benefits. To meet the PM emission reduction requirements, engine manufactures have introduced particulate filters in the 2007 truck engine. The filter acts as a trap by collecting particles in diesel exhaust before they enter the atmosphere. However, the particulate traps weigh up to 136 kg (300 lbs.)

when they are clean and as much as 227 kg (500 lbs.) when filled with PM, which eats directly into vehicle payload and therefore efficiency.

The provinces and territories should allow a weight allowance on a truck's maximum gross vehicle weight of up to 227 kg (500lbs.) on 2007-2010 trucks to eliminate the payload penalty associated with particulate traps.

3. Wide-Base, Fuel Efficient Truck Tires

Tire rolling resistance accounts for nearly 35% of the fuel consumed by a truck. Most tractor-trailer units have dual tire assemblies on the drive and trailer axles, with two sets of wheels and tires at each end of an axle. This configuration increases rolling resistance compared to if single wide-base tires and wheels could be used. Furthermore, single wide-base tires and wheels are lighter than standard dual tires and wheels. Total weight savings for a typical combination truck using single wide-base tires (instead of duals) on its drive and trailer axles ranges from 800 to 1,000 lbs, which increases the carrying capacity per vehicle, improves fuel consumption per load, and reduces GHG emissions. Recent tests of tractor-trailers using the new generation of wide-base single truck tires indicate a potential fuel economy savings of 2%-4% compared to units using conventional duals tires. This amounts to an annual savings of 1,520 litres of diesel fuel for a typical tractor trailer unit, a reduction of 4 metric tonnes of GHG emissions, 0.6 kilograms of PM and over 28 kilograms of NOx emissions.

The major factor inhibiting the use of wide base single tires are that at the present time the maximum allowable vehicle weights for many Canadian tractor-trailer configurations units (in all provinces except Quebec) are lower when equipped with wide-base single tires than for the same vehicles equipped with conventional dual tires, and there are differences in the allowable weights between the various provincial governments. Contrary to the prevailing Canadian jurisdictions' positions on these tires, they are acceptable for use in 50 US states and in fact the US EPA's Smartway Program promotes the use of these tires.

Recent research indicates that the new generations of wide-base tires have no more impact on the infrastructure than standards dual tires. Recently, Quebec became the first province to harmonize the allowable weights for dual and single wide-base tires, while some other provinces are studying the matter.

The provinces and territories should allow the use of the new generation wide-base single truck tires and allow them to be used at the same maximum allowable weights as the current standards for conventional dual tires.

4. Barriers to Fuel Efficient Vehicle Designs

A. Truck and trailer manufactures and carriers are exploring ways to improve fuel efficiency and reduce GHG emissions The introduction of non-payload aerodynamic improvements such as roof fairing, cab extenders and side fairings could result in per unit reductions of almost 2,300 litres of diesel fuel, 5 metric tonnes of GHG, 900 grams of PM and over 42,300 grams of NOx emissions.

While significant advancements have been achieved in the aerodynamic design of tractors and trailers, there is still room for further improvements and enhancements.

Provincial regulations governing truck weights and dimensions can be a barrier to streamlining trucks through aerodynamic devices as sometimes the addition of these improvements can put a tractor-trailer combination in violation of vehicle length standards even though the carrier does not benefit from any increased payload capacity. As an example aerodynamic boat tails are not allowed to be used on trailers without negatively impacting the box length of trailers.

The provinces and territories should allow flexibility within their truck weights and dimensions standards and regulations to allow carriers to add non-payload aerodynamic improvements to their equipment.

B. Longer Vehicle Combinations are presently allowed on a controlled basis (e.g., specific routes, times of day, weather conditions, etc.) in Alberta, Saskatchewan, Manitoba and Quebec. New Brunswick is presently piloting their use. One of the major impediments to the expanded use of these fuel-efficient vehicles is Ontario, which does not presently allow their use under any conditions.

It should be noted that these combinations have been operating in Alberta, Saskatchewan and Manitoba for approximately thirty plus years with an admirable safety record. A study commissioned by the Province of Alberta in 2001 clearly indicated the admirable safety record of these combinations in relationship to traditional tractor trailer combinations and smaller commercial vehicles.

The Government of Canada has been working with the trucking industry and is in the process of completing a joint NRCAN/CTA study on this issue. The draft report indicates a significant reduction in pollutant emissions and GHG's with the extension of a Longer Vehicle Combination network in Canada. It is also noteworthy that the expansion of a Longer Vehicle Combination network was deemed to be the number one action in terms of combined environmental and economic benefit that could be taken to reduce GHG emissions in trucking according the federal Transportation Table on Climate Change.

All provinces and territories should allow the use of Longer Vehicle Combinations on the appropriate highways within their jurisdictions.

C. In Alberta, Saskatchewan and Manitoba there is a requirement for highway shoulders to be paved or partially paved for Longer Vehicle Combination operations.

The initial rationale for this requirement was primarily as a result of rear trailer amplification associated with triple trailer combinations. This characteristic is not an issue with Rocky Mountain Double and Turnpike Double combinations; therefore, this requirement for these combinations should be removed.

The provinces and territories should expand Longer Vehicle Combination networks to include single lane highways without paved or partially paved shoulders for the operation of Rocky Mountain Double, Turnpike Double, and any other future combinations with similar or enhanced operational characteristics.

D. Within the near future the Trans Canada Highway in Manitoba, Saskatchewan and Alberta will be a divided double lane highway. When this occurs carriers transporting between these three provinces will significantly increase their use of Rocky Mountain Double and Turnpike Double combinations. Currently, based on the maximum allowable overall length of these combinations, carriers cannot use RTAC tractors with a maximum wheelbase of 6.2 metres (244") with these combinations. This precludes carriers from utilizing tractors with sleeper bunks with these combinations. Carriers with Long Vehicle Combination operations in Alberta, Saskatchewan and Manitoba while operating in other marketplaces would have to maintain two distinctive fleets, which would be not be efficient.

The provinces and territories should increase the maximum allowable overall length of Longer Vehicle Combination vehicles to allow the use of RTAC tractors with a maximum wheelbase of 6.2 metres (244").

Conclusion

This document speaks to the issue of environmental stewardship and opportunities for the Canadian trucking industry to become better stewards. It introduces (or in some cases re-introduces) a number of realistic actions that can be taken to mitigate the Canadian trucking industry's impact on the environment and its impact on climate change.

The provinces and territories are encouraged to embrace and adopt these recommendations, and demonstrate their commitment and support to the advancement of environmental stewardship in the Canadian trucking industry.

Respectfully submitted,

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