A RESPONSE TO THE 'DISCUSSION PAPER ON CANADA'S CONTRIBUTION TO ADDRESSING CLIMATE CHANGE'

Submitted by
The Railway Association of Canada

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Final

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INTRODUCTION

The Railway Association of Canada has worked diligently to provide incisive and insightful policy and research work in the areas of climate change and sustainability. With the support of freight and passenger/commuter railways the RAC welcomes another opportunity to contribute to this discussion and is pleased to provide a response to the *Discussion Paper on Canada's Contribution to Addressing Climate Change.*

This submission clearly outlines that railways have a significant energy advantage over other land based modes of transportation. It also illustrates that railways are not only used by primary resource industries but carry a significant portion of goods critical to the modern day Canadian economy. It goes on to provide feedback on the measures proposed in the discussion paper and suggests that serious consideration be given to the question of optimal modal balance and the GHG reduction that could be garnered with a shift of traffic from truck to rail. The RAC would also like to take this opportunity to endorse the Canadian Urban Transit Association's submission.

The bottom line is that with a small number of targeted low cost measures and policy changes by government, rail, both freight and passenger would be able to fill a major piece of Canada's "Kyoto Gap".

SUSTAINABILITY

Sustainable development is one of the greatest challenges facing the planet. Transportation sustainability represents an important challenge everywhere, but especially in industrialized countries such as Canada. The country continues to increase emissions of Greenhouse Gases (GHGs) and toxic pollutants, congestion (verging on gridlock at times in some cities), and land use conflicts.

The existing fragmentation of jurisdictions and conflicting policy goals are proving to be obstacles to reducing our consumption of energy, maintaining environmental quality, and making more efficient use of capital and human resources. A profound reassessment of social, economic and environmental values is urgently needed. Such a paradigm shift must bring about changes that transcend the performance of transportation providers by also influencing the factors that motivate decisions and preferences of shippers and travelers.

The need for fundamental change in travel and physical distribution patterns is most critical in large urban centres where the main bottlenecks occur. Change in major urban centres is a necessary condition for success. Certain border crossings (up to five in number) are also critical for road and rail movement of freight and people. Solving the problems on intercity links alone, while significant, will not have sufficient impact to make transportation sustainable in the long term.

The latest Environment Canada fact sheet (Number 3) confirms that this trend continues. To quote:

> *"Between 1990 and 1999, this sector (transportation) contributed 33% of Canada's emissions growth of 91.4 Mt from 1990 to 1999. In 1990, transportation is estimated to have emitted 146.0 Mt; in 1999, this has risen 21% to 176.6 Mt.*

*Almost all of the growth in emissions since 1990 can be attributed to 3 sub-sections. **Light-Duty Gasoline Trucks (LDGT)**, the category including Sport Utility Vehicles (SUVs) and Minivans, contributed 42% or 13.0 Mt of this sector growth, **Heavy-Duty Diesel Vehicles (HDDV)** contributed 40% or 12.3 Mt and **Off-Road Diesel Vehicles** were responsible for 15% or 4.4 Mt of overall sectoral growth."*[1]

There are significant differences between emission levels in rural and urban areas, with the situation in certain urban centres approaching crisis levels at peak times during the year. Although, alarmingly, some rural communities north of Toronto have recently begun to experience serious air quality degradation when smog advisories have been issued in the city itself. Passenger and freight transportation also face different issues as do each of the modes considered independently, (i.e. air, road, rail and marine). In addition to some of the health concerns they raise, problems related to environmental emissions are closely linked to problems associated with efficiency, in that major bottleneck congestion is a common theme running through both economic and environmental problems.

RAC MOU with Environment Canada

In 1995, the RAC voluntarily entered into a Memorandum of Understanding (MOU) with Environment Canada (EC) in which the railway industry agreed to cap their emissions of NOx at 115 kilotonnes. This agreement is in effect until 2005. The railway industry has never exceeded the cap even while significantly increasing activity. The MOU also sets out a methodology for calculating the overall level of a range of emissions from data on fuel consumption provided by the railways. Discussions have been held between the RAC and EC on expanding the MOU to cover other types of emissions such as GHGs.

These issues appear to be greatest in and around cities and at certain congested border crossings. The ramifications of these 'choke' points extend well beyond the environment, into the social fabric of the nation and the competitiveness of Canada as a trading nation, particularly because it relies so heavily on its ports and border crossings on a daily basis.

Major Canadian urban centres are confronted with considerable population and land use growth projections. Increases in emissions will continue at a brisk pace despite significant technical advances in virtually all modes of transportation. Population in urban centres and urban traffic will grow at rates far exceeding the potential of traditional efficiency measures to cope with resultant congestion and emission increases.

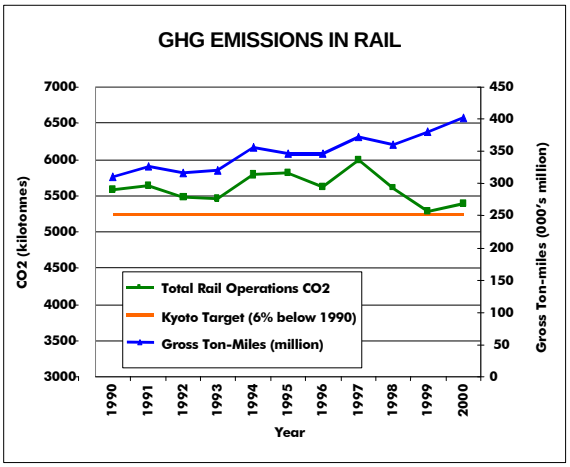
All of this means that notwithstanding the 1997 targets proposed in the Kyoto Protocol, (which for Canada would mean a reduction in total emissions for all industries to a level approximately 6% below 1990 emission levels), actual emissions will in fact grow and probably exceed the 2010 targets by one third or more. The challenge associated with the Kyoto targets is greatest in and around cities, and it is exacerbated by society's increasing reliance on roads for transportation of all types.

[1] Canada's Greenhouse Gas Inventory, Fact Sheet #3, Environment Canada, January 2002.

RAIL'S EMISSION PERFORMANCE

Greenhouse Gases (GHG)

With respect to GHG, rail's performance is different, positive and sustainable. Canada's railways are Kyoto compliant according to the latest Environment Canada data. From 1990 to 1999, GHG emissions from Canadian railways decreased by 8.5%. This is while managing a growth of 30% in business levels since 1990 (see Table 1). There are few energy-consuming industries that can claim such results, and certainly no others in the transportation sector.



Note: Based on railway fuel consumption; somewhat different from Environment Canada's estimate, trends are very similar also contains 2000 results.

To illustrate the striking difference, heavy duty diesel trucks are responsible for 40% (total emissions up 50%) of the growth of GHG emissions in the transportation sector from 1990 to 1999, while rail's decrease in emissions reduced overall GHG growth in the transportation sector by 2%. It is worthwhile to note that railways carry approximately 60% by volume of rail/truck activity in Canada while trucking accounts for 40%. In 1999 the rail sector produced 6.5 megatonnes (Mt) of GHG emissions, while heavy-duty diesel trucks alone produced 36.9 Mt of emissions…a ratio 5.7 times higher than rail.

Table 1 – Transportation Sector GHG Emissions

Mode	GHG Emissions (Mt)		Change		Contribution to 1999 Total	Contribution to 1990-1999 Growth
	19 0	19 9	N t	9	%	%
Heavy Duty Trucks	24.6	36.9	12.3	50.2	21	40
Rail	7.1	6.5	-0.6	-8.5%	4	-2
Vehicles SubTotal	146.0	176.6	30.6	21.0%	100%	100%

Source: Canada's Greenhouse Inventory Fact Sheet #3, Environment Canada, January 2002

The reason for this performance is the intrinsic fuel efficiency advantage of railways. To quote Environment Canada "rail transport boasts the lowest GHG intensity of all freight modes. Total emissions actually declined by 8.5%...further reducing rail's GHG intensity by 23.5%."

The advantage of rail is simple physics. Steel wheels on steel track produces significantly lower friction than rubber tires on pavement. Furthermore, the rail system has very low grades; locomotives and cars can be coupled together to gain maximum rolling efficiency. These advantages combined means that much less horsepower is needed to move goods on rail. For example, less than 100 Hp is required to transport a truckload equivalent of materials on rail. This compares to 400-500 Hp in the average heavy-duty diesel truck.

Since 1990, railways in Canada have been able to steadily reduce emissions by reducing fuel consumption. This has been achieved in a number of ways:

- New highly efficient locomotives: Over the last few years, both CN and CPR have purchased a significant number of new higher horsepower locomotives. These locomotives improve overall fuel efficiency by approximately 18-20% and are Environmental Protection (EPA) compliant. The increased fuel efficiency translates to fewer exhaust emissions and the increased horsepower allows more work to be done with fewer locomotives.

- Increased system efficiency through better operating practices and the use of technology.

  Examples:

  - The industry hauls more products and generates more revenue but does it with almost 1/3 fewer locomotives and 1/4 less rail cars.

  - CN and CPR have entered into an agreement to share track capacity through the Fraser Canyon east of Vancouver. This allows both railways to move all of the heavy westbound traffic on the side of the river with the lowest uphill grade. They run empty cars plus the light container trains in the opposite direction on the other side of the canyon. This operating change alone has allowed westbound trains to use one less locomotive – considerably reducing fuel consumption and GHG emissions.

  - The use of longer trains, up to 12,000 feet, has allowed for a better match between required locomotive horsepower to weight and speed per movement. As a result, overall locomotive efficiency, as measured by gross tonne miles per horsepower, increased by 11 percent in 2000 and another 3 percent last year.

Other Emissions

Although GHG emissions represent a pressing global concern, the state of air quality, especially in Canada's dense urban areas, cannot be ignored. Last year, Toronto had 23 smog alert days, almost double its previous record of 11 for 1998. Air quality in urban areas is a function of emissions of oxides of nitrogen, particulate matter, volatile organic compounds and carbon monoxides. In terms of these types of emissions rail also compares very favourably. Although there are some nuances, the amount of these types of emissions like GHGs is generally directly

proportional to fuel consumed. Given rail's intrinsic fuel efficiency, all types of non-GHG emissions are lower per unit of output than other land based surface transportation modes. Table 2 outlines the latest Environment Canada data for other types of emissions.

Table 2 - Others Emissions: Heavy Duty Truck and Railways 2000

	PM[2]	VOC[3]	CO[4]	NOX[5]	SOx[6]
Heavy duty trucks emissions (intercity)	11,108	18,288	130,268	274,923	4,760
Truck tonne-kms (billions)	203	203	203	203	203
Heavy duty trucks activity tonne-kms (billions)	174	174	174	174	174
grams per truck tonne-km	0.098	0.161	1.148	2.422	0.042
Grams per inter-city truck tonne-km	**0.064**	**0.105**	**0.747**	**1.577**	**0.027**
Rail emissions tonnes	2,600	5,510	20,880	109,290	5040
Rail freight emissions (96.9%)	2,519	5,339	20,233	105,902	4,884
Rail tonne-kms (billions)	322	322	322	322	322
Grams per rail tonne-km	**0.008**	**0.017**	**0.063**	**0.329**	**0.015**
Ratio Inter-city truck/rail (grams per tonne-km)	**8 to 1**	**6 to 1**	**12 to 1**	**5 to 1**	**2 to 1**

Source: Environment Canada, Railway Association of Canada.

In all cases rail outperforms trucks in grams per tonne-km of emissions, the best measure of emissions per unit of work. In the case of emissions that are linked to smog production, particularly nitrogen oxide(s) (Nox), the story is very much the same. The findings are contained in RAC's latest filing under the terms of the Memorandum of Understanding between Environment Canada and the RAC, signed in 1995 and covering the period 1990-2005.

The policy goal for Canada should be a framework which minimizes emissions per unit of work. In the transportation sector, this measure of unit of work is tonne-kms which incorporates both the weight of goods carried and the distance. This is the only relevant and real benchmark of emissions performance.

The data collected by the railway industry under the monitoring program include annual traffic volumes on gross ton-miles and net ton-miles, the annual diesel fuel consumption for mainline and branchline service and for yard switching and passenger service. As well, the data includes the annual emissions of oxides of nitrogen (capped at 115 kilotonnes) and carbon dioxide, of hydrocarbons, oxides of sulphur, particulate matter, and carbon monoxide, for information purposes.

The railways calculated and reported voluntarily on their fuel consumption and emissions in three designated Tropospheric Ozone Management Areas for 2000: the Lower Fraser Valley in British Columbia, the Windsor-Quebec City Corridor, and the Saint John area in New Brunswick. They

[2] Particulate matter
[3] Volatile organic compounds
[4] Carbon monoxide
[5] Oxides of nitrogen
[6] Oxides of sulphur

also segregated their data for winter and summer operations and tracked measures being undertaken to reduce fuel consumption and consequent emissions.

The U.S. EPA has set standards for emissions of air pollutants such as hydrocarbons, nitrogen oxides and particulates from new and rebuilt locomotives.
Transport Canada has no such regulations. Instead, the Railway Association of Canada has entered into a voluntary emissions cap under a Memorandum of Understanding with Environment Canada (referred to above).

In practice, Canadian railways are buying locomotives that comply with US EPA emission standards Tier 0 (2000) and plan to buy those that comply with Tier 1 (2002) and Tier 2 (2004). The RAC is of the view that the Canadian market is too small to have different specifications. Rebuilds in Canada that do not meet EPA rebuild standards are allowed to operate in sporadic transborder service, but cannot operate in domestic U.S. service. As presented in the previous data, the overall quantity of emissions is small.

RAIL'S ROLE IN THE ECONOMY

As an essential part of Canada's transportation system, the railway companies contribute directly to national competitiveness and prosperity.

Canada's railways play a major role in the nation's economy:

- Contributing $10 billion annually to the Canadian economy
- Employing 41,000 people with average annual earnings of $59,000
- Operating one of the largest railway systems in the world
- Minimizing the economic shock of rising transport fuel prices on the economy (five times more fuel-efficient than inter-city trucks)
- Minimizing the environmental impacts of transportation
- Contributing over $640 million in taxes annually

Canada's railways are a major link to external markets:

- Exports account for 40 percent of Canadian GDP and 40 percent of its exports move by rail. Two-thirds of Canada's rail traffic is the result of external trade
- For many products, transportation is a significant portion of total costs. Thus, for Canadian exports to be competitive in world markets, delivery costs must be the lowest possible
- Rail routes strategically located to take advantage of the growing NAFTA economy
- Partnerships with Canadian ports to maximize use of Canadian routes

Canadian industry depends on rail to get their products to market:

- Coal 99%
- Grain 90%
- Auto industry output 90%
- Aluminium inputs 75%

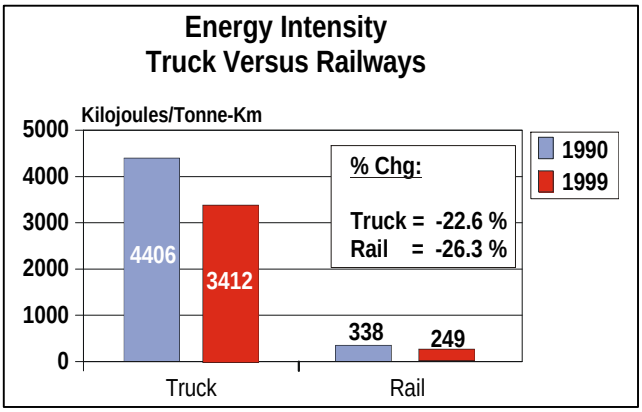
- Chemical industry output 70%
- Potash, chemical fertilizer 65%
- Pulp and paper 50%
- Steel 40%

Rail plays an important role in the Canadian transportation market:

- $322 billion revenue tonne-kilometres, up from $246 billion in 1991
- Almost 4 million carloads, equivalent to 12 million truck loads
- 1.5 million containers/trailers
- 4.2 million inter-city passengers
- 47 million rail commuters in Montreal, Toronto and Vancouver

DISPELLING MYTHS

Myth #1. Trucks are reducing emissions and becoming more efficient much more rapidly than railways

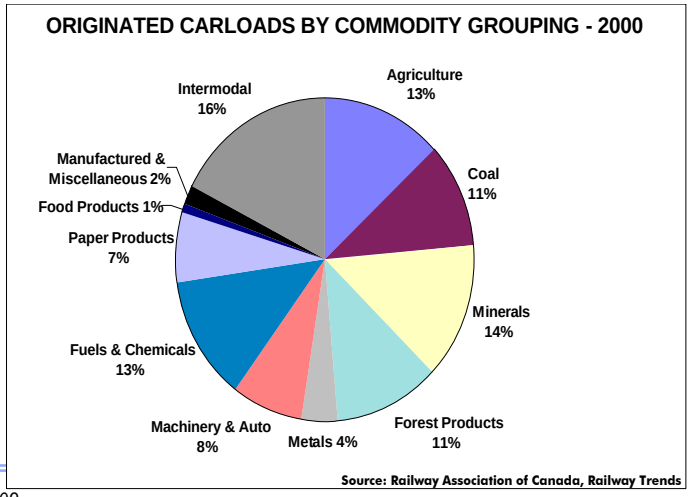


Between 1990 and 1999, truck energy intensity (energy per tonne-kilometre) declined 22.6 per cent, and most of this gain was in large trucks rather than small and medium trucks. Rail's energy intensity declined 26.3 per cent. In absolute terms, truck energy intensity declined by 994 kilojoules per tonne-kilometre compared to a decline of 89 for rail. Again, this is because the base amount for truck in 1990 was 13 times bigger (4406 kilojoules per tonne-kilometre compared to 338 for rail) and thus truck had more to shed. Recall that rail is extremely efficient at hauling over 60% by volume of total truck/rail freight in Canada while using a significantly lower number of power units than trucking.

Reality: In 1999, trucks had 13 times the energy intensity of rail, from 1990 to 1999

Myth #2. Railways carry only heavy, commodity type goods … they do not participate in the "new economy"

Intermodal traffic now represents the largest and most rapidly growing commodity component of the rail sector. Growth in intermodal activity (both trailers and containers) is up 53.1% from 1995 to 2000.

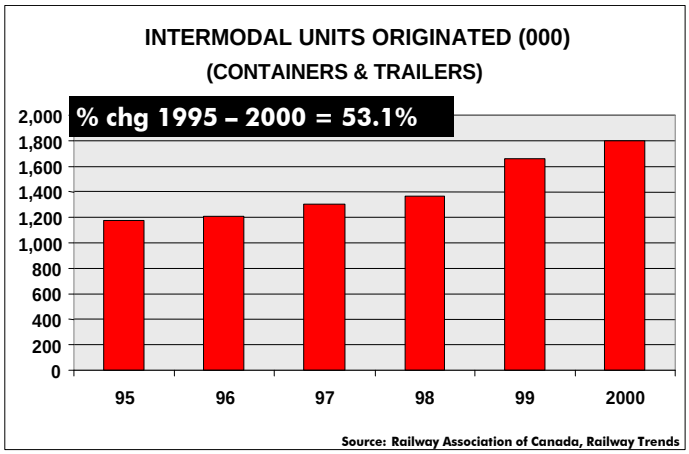


There are essentially two intermodal product segments:

Domestic: consumer products and manufactured goods, operating through both retail and wholesale channels within Canada and U.S.

International: handling import and export traffic through the ports of Vancouver, Montreal, Halifax, Mobile and New Orleans.

As a result of the growth in intermodal traffic over the last few years, containers and trailers now represent the largest single commodity grouping for the industry. If all the non-primary commodity groups are added together, the results show that half of rail's business is of significant value per unit and not, as the stereotype suggests, heavy, commodity type goods.



Innovative Intermodal Initiatives

CN's new **RoadRailer®** Service is a perfect example of how we use innovative technology to meet 21st century shipping challenges. This unique service provides CN customers with the best of both worlds; the flexibility of trucking and the efficiency of rail.....Since RoadRailer® trailers can travel on both rail and road, they can offer a seamless, door-to-door service at very competitive prices. RoadRailer® is another example of continuing commitments to easing the congestion on the highways and protecting our environment'

CPR's **Expressway** is a revolutionary short-to medium-haul transportation service that combines the best of truck and rail to help reduce costs and better serve customers' needs.
Developed with input from trucking companies, and CPR's $52 million investment, Expressway allows shippers to move their standard, non-reinforced trailers in high-volume corridors. Expressway services are strategically located - with hubs in Toronto, Montreal and Detroit providing round-the-clock services and an easy-to-use reservation system.

Both of the Class 1 freight railways along with their short line partners have been and continue to be very innovative in offering new products, services and guarantees on scheduled delivery. This has allowed them to attract significant amounts of new business involving high value goods.

Reality: Intermodal traffic (high value products) represents the fastest growing and largest single commodity group for railways in Canada.

Myth #3. Railways are only effective for long haul traffic

It is interesting to note that while rail has targeted specific services (CPR Expressway, CN Roadrailer) for shorter haul intercity movements, trucking continues to haul over longer distances; a trend that has emerged as a consequence of the rapid growth in cross-border traffic. In the case of for-hire Canadian trucking carriers the average domestic shipment distance is 674 kms, the average transborder shipment distance is 1110 kms for a total average shipment of 771 kms. The average length of haul for Canadian railways in domestic and cross-border traffic is 1,267 kms, very close to transborder shipment distance for cross border truck traffic.

A great deal of rail activity does occur in the 500 to 700 km move range, especially in dense urban and NAFTA corridors.

Short line and regional railways generally feed traffic to and from the long haul carriers. They have an average length of haul of 301 kms and compete directly with the trucking sector for their market share.

Reality: Railways have introduced services which target short haul movements, furthermore the average shipment distance for trucks is comparable to rail especially for cross-border traffic.

Myth #4. Railways cannot operate in a just-in-time economy

The way railways operate in Canada has changed dramatically over the last few years. One of the most significant is the introduction of a fully scheduled freight railway. Although to people with a non-railway background, this does not seem like a significant change in approach; it clearly is. In the past, freight railways did not follow precise schedules. The conventional wisdom was when you finished assembling a big train, it would then depart. This was, in part, a function of a regulated industry, with decisions being made only on the basis of reducing costs. Service was less of a consideration. Today, this philosophy has changed significantly and railway customers have noticed radically improved reliability in terms of delivery and on-time performance. Customer satisfaction has become the watchword for freight as well. Significant investments have been made in new logistics data systems to put the tools in place to make over 90% on-time service a reality.

Furthermore rail traffic, compared to other modes, was not severely affected by the events of September 11th, largely because of previous investments and best practices in security. These include:

- Dedicated, private and controlled corridors
- Large railways have their own police forces
- Railway security measures in place since 1997 Memorandum Of Understanding (MOU) between RAC and Government of Canada

Rail has maintained its reliability in freight delivery in the wake of these events. It is also fast becoming a popular alternative to air travel, where passenger service is concerned in the short to medium haul intercity market, rail's downtown to downtown passenger services have been picking up market share, for example, in the Quebec City-Windsor corridor.

Reality: Railways have undergone tremendous change over the last few years, they operate a scheduled service & customer service has become a key consideration.

THE POLICY OPTIONS

Of the four options proposed in the Climate Change Discussion Paper, Option 2: All Targeted Measures is the approach preferred by the RAC.

Why?

- It will provide tangible measurable outcomes;
- It will target areas where the benefits are the greatest for the least cost; and
- Allows for the greatest flexibility to deal with competitiveness issues

Option 1, although appealing in theory, has many issues associated with its practicality in operation. RAC supports the move towards reducing the externalities related to emissions and recognizes that this would involve an emissions trading scheme. But the RAC cautions changes should be introduced in a methodical, well thought-out manner, especially given the high level of Canada's integration in the global and NAFTA economies. Given the complexity and the myriad of issues associated with a trading scheme, the RAC fears this would not provide the early results necessary to make rapid progress towards sustainability and reducing emissions. Nevertheless, government should continue examining options and moving forward in this area. The major concern is that a solitary focus on an emissions trading scheme would not allow Canada to take advantage of the significant opportunities presented in various targeted measures.

Options 3 & 4 have merit, but suffer the same weaknesses of Option 1, namely difficulty in implementation and significant complexity. Their ability to provide tangible results is reduced by the fact that it assumes an international permit trading scheme is in place. Like Option 1, efforts should be undertaken to put in place international trading schemes, but these should not take away from or preclude progress and a dedicated effort to target measures that will have a more immediate effect.

The Measures

The RAC supports the examples of specific measures cited by the Federal Government which would have a positive impact on reducing GHG emissions in the transportation sector, namely:

1- Increasing parking fees in major urban centres, introducing tolls on major highways and enforcing current speed limits;
2- Investing in public transit infrastructure;
3- Encouraging take-up of best practices, alternative fuels, anti-idling technology and replacement of older vehicles in the goods transport industry; and
4- Linking rail and road systems. Particularly targeted incentives/measures for truckers and shippers to increase use of intermodal services.

Nevertheless, there is a key measure missing:

Optimal Modal Balance

As demonstrated earlier in this paper, railways have a considerable fuel efficiency advantage over other land based surface transportation modes which are utilized for both the movement of goods and people. Increased use of railways would involve a shift towards a mode which, on a revenue per tonne-mile basis, would cut emissions by as much as one fifth.

To illustrate on a more macro level, here is a quote from a recent RAC letter sent to Minister David Anderson:

"On the other hand, if in 1990 governments had begun to implement the right policy changes to level the playing field with trucks and had pursued an increased intermodal focus, rail could have grown their share to represent as much as 75% of truck/rail activity (vs. current 62%). In that case, overall emissions from the freight sector in 1999 would have been 1.2% below 1990 levels. The 13% increase in rail's modal share would have changed the situation from a totally unsustainable 30% increase in freight sector emissions to a manageable, a more Kyoto-consistent 1.5% reduction in GHG emissions as indicated above. Thus, given that an average train can take up to 280 trucks or 1000 cars off the public roads, there are a number of opportunities for government to adjust its policies and register immediate GHG reductions."

If looked at on a Mt basis, a 10-15% market share gain (tonne-kms) would have reversed the 14 Mt increase in the transportation sector that represents 6% of Canada's total GHG target gap (of 238 Mt) or approximately 14% of the target gap "still to fill" (96 Mt) after clean energy export credits, etc.

What needs to happen to effect a more optimum modal balance:

1. Taxes: Reduce the tax burden for railways to help put rail on an equal footing with other surface modes of transportation and U.S. railroads. Currently, rail pays direct taxes on fuel, property and capital and has a capital cost allowance (CCA) rate half that of U.S. railroads and Canadian truck carriers. Make monthly transit and rail passes a tax deduction.

2. Infrastructure investment: Include strategic rail infrastructure funding (especially for short lines) as part of any publicly funded infrastructure. In many cases, short lines do not have traffic density levels warranting significant capital investments. This problem has been escalated by the North American railway trend to use heavier cars. In all cases, short lines compete against trucking which utilizes publicly-funded infrastructure. There is clearly a role here for private/public partnering. If this does not happen, increased truck traffic will be a result as these short lines lose business and market share.

3. Deregulation: Public policy makers must maintain the perspective in existing and future policies that railways are commercial enterprises with responsibilities to shareholders, employees and the community; policies that alter the equilibrium between responding to these various roles could in fact threaten the sustainability of the industry.

4. Promote passenger rail in Canada: The Federal government should play a larger role in funding passenger/commuter rail in Canada. Through direct contributions for operating costs, capital and technological upgrades, and through innovative tax measures.

5. Truck size and weights: The Federal/provincial government should reduce existing standards on truck sizes and weights and commence initiatives to standardize truck size and weights across Canada. Although, longer/heavier trucks may represent an opportunity to reduce trucking emissions, the resulting induced shift from rail to truck would increase overall freight sector emissions and destroy the economic viability of the railway industry.

6. Truck hours of service: The Federal/provincial government should not increase the hours of service for truck operators in Canada.

7. Highway user fees: Government should move towards a system of user fees for commercial highway users in Canada. Currently, large trucks only cover about 50% of the damage they inflict on highways in Canada. Removal of this indirect subsidy would create a more level playing field with railways who privately build, maintain and finance their own networks.

8. The growth of short lines: Government should actively promote and support short line railways in recognition of their importance to the viability of regional economies and recognize their primary competition. Trucking is implicitly subsidized because it operates on publicly funded infrastructure.

Note: While some groups have argued that targeted measures would cost billions of dollars and seriously retard Canada's economic growth rate, the foregoing initiatives are primarily policy framework changes, and do not cost billions; nor will they constrain Canada's economic growth.

THE BOTTOM LINE

- In the surface freight sector there was a significant increase in GHG emitted between 1990 and 1999, amounting to 14 megatonnes. This was all attributable to the growth in truck traffic. During that period rail, while its traffic grew 30%, actually reduced its emissions and as an industry is Kyoto compliant. This success has been achieved through a voluntary MOU with Environment Canada. According to a report by Environment Canada earlier this year, "rail transport boasts the lowest GHG inventory of all the freight modes."

- With the measures recommended in the foregoing section, if Canada was able to shift more traffic to intermodal rail (and commuter rail) – recent analysis indicates 10 –15% market share gains are possible – that 14 MT gain in transportation GHG emissions could be reversed. Fourteen (14) MT is not insignificant; it represents 6% of Canada's total GHG target gap (of 238 MT) or approximately 14% of the target gap "still to fill" (96 MT) after clean energy export credits etc.

ANNEX A

TRANSPORTATION DATA GAPS

Despite broad measures of total freight activity and total passenger activity at the national level for each mode of transportation, there are important gaps in data for transportation policy and planning, especially regarding modal integration. To be able to quantify the impact on emissions from measures mentioned above, a clear understanding is required of "system effects".

Measurement of total freight and passenger activity is a chronic problem, spanning generations of planners and policy makers. Data on road transport, especially for private trucking, and in recent years, for domestic marine freight activity as well, is incomplete and inconsistent across the country. Very little at all is known about urban goods movements. This uncertainty compromises estimates of total road transport of goods, and thus has a significant bearing on estimates of intercity freight movements. There is great need for an established authoritative measurement of the total amount of trucking activity that actually occurs within urban areas, separately recording local distribution and collection from long distance. There does not appear to have been significant desire on the part of public administrators to address this deficiency. A fragmented approach to regulation and operation of the industry and its infrastructure explains in part the lack of progress. With so many autonomous players, agreement on overall national needs has not taken place.

Similar problems of data availability pervade the commuter sector. At the municipal level, trip origin-destination data is sparse. Even in the major cities of Toronto, Montreal and Vancouver where periodic surveys are conducted, the time between such surveys is such that there is little to build upon to identify emerging trends in demand over periods less than five years.

In both passenger and freight modes, gathering data has been seen as too costly and considered not to be worth the effort required to do more. Times are changing, and technology is readily available to overcome many of these difficulties. In fact, many carriers are adopting technological solutions for their own benefit, that could be exploited to improve the coverage and quality of transportation data. The federal government should set goals and assign resources to use new information technology to meet needs for data.

With respect to transportation involving two or more modes, (such as marine-rail-truck, rail-truck, ferries, etc.) the problem is even more difficult. The inability to trace movements through modes has been cited recently, since September 11th, 2001, as a significant issue for security concerns at the international level. Loss of continuity in information as traffic moves from one mode to another leaves a gap in accountability for the merchandise or for the containers.

A simple and less sinister example of discontinuity is the example of a shipment of lumber from a mill in British Columbia which leaves by truck to a rail reload centre in the interior of British Columbia, and then carries on by rail to the Port of Vancouver where it may go by rail into the port or be drayed to the port from a rail team track to be put on ship (to name but two of many export options). The weight of this load of lumber would actually appear in transportation statistics, (if in fact the system were accurate enough to capture 100% of the movements) as three shipments, two

by truck, and one by rail and in fact the final export would also appear in marine data. The shipment should be counted once and the activities associated with delivering it to market for the beneficial owner of the goods should be recorded in a straightforward manner.

As mentioned above, the technology is in commercial use today to carry out these activities, and with motivation and appropriate leadership, innovative use of technology that is already in common usage for other purposes could go a long way to improving data on goods movements.

Current methods used to capture transportation statistics through the surveys conducted by Statistics Canada rely on methods that have long become outdated and are too costly to be sustained in the Government budgetary processes. The gathering of information on transportation activity is one area where new thinking should be applied on an urgent basis.

Previous estimates of the benefits of a modal shift from truck to railway

There have been a few attempts to quantify the amount of truck traffic that could potentially be carried by railways. Two of these are notable and discussed below.

A background paper[7] for the Climate Change Transportation Table examined intermodal rail options to truck transport in the corridors Vancouver-Calgary, Montreal-Toronto, Halifax-Toronto, and Toronto-Chicago. Based on the findings of additional cost and GHG emissions reduced, the Transportation Table concluded that freight mode shift was not a likely option. Problems with this study include:

- Did not model the intermodal service to operate in a level financial playing field (e.g. road pricing for trucks)
- Did not do a systems analysis of policy changes to remove barriers to using intermodal, but focused on a few corridors with no change to intermodal policies
- Quantified costs (additional intermodal equipment and service), but not the ancillary benefits (reduce highway congestion, avoid highway expansion, reduce collisions)
- Did not model the intermodal service to use information technology to enforce legal truck speed limits and hours of work regulations (level playing field for safety compliance). This would increase the volume of mode shift, improve the economics of intermodal service, and reduce the cost per tonne of emission saved

In 1998, Transport Canada did a mode shift analysis (contestable truck traffic) in support of deliberations of the Transportation Climate Change Table. Two of the authors (Terry Ganton and Catherine Kim) presented a summary of findings to the 2000 Canadian Transportation Research Forum conference.[8] It concluded that the amount of domestic truck traffic contestable by rail is less than 10 per cent in terms of tonnes. However, 19 per cent of export tonnes and six per cent of import tonnes by truck are contestable by rail. Although this study focused on tones, RAC believes

[7] Delcan et al, *Assessment of Modal Integration and Mode Shift Opportunities*, 1999
[8] Ganton and Kim, "The Potential for Modal Shift: Contestable Truck Traffic", CTRF, 2000

that, because contestable traffic tends to be longer distance, the corresponding percentage of tonne-kilometres would be proportionately greater than by tonnes. For example, the percentage of domestic truck traffic contestable by rail is three times greater by tonne-kms, the best measure of activity, than by tonnes. Other weaknesses in the TC analysis:

- The Transport Canada contestable traffic analysis screened out short distance traffic, for example newsprint moving less than 800 kms. This distance screen apparently had the effect of assuming little mode shift potential in the Quebec City- Windsor corridor.

- It assumed that all truck traffic between adjacent States and Provinces was incontestable by rail, for example Ontario to or from Michigan, New York, Pennsylvania, Ohio, Wisconsin and Minnesota. New technologies such as Expressway are reducing the distance threshold. As with the other study, there appears to have been no testing the impact of policies to remove barriers to intermodal or to level the playing field.

- The analysis includes only a subset of the truck traffic, namely, the large intercity carriers as surveyed in Statistics Canada Trucking Origin-Destination Survey. Three types of truck traffic are excluded:
    - Transported by small truckers, (revenues of less than $1M per year)
    - Transported by private trucking carriers, and
    - Transported by Non-Canadian based truckers.

  These missing pieces are significant. Taken together, they account for more than half of the total truck traffic in Canada. The RAC believes there is no reason to exclude this traffic from an analysis of the contestable freight. In fact, it is reasonable to assume that any traffic having the right profile of distance and commodity is a good candidate for modal shift, whether it is currently transported by large, small, private or U.S. trucks.

- Additional criteria were applied in Transport Canada's evaluation that further contributed to restricting the estimate of the contestable traffic. The matched-flow criteria excludes origin-destination (O-D) pairs where truck is the only existing mode today. The Share criteria excludes O-D pairs where truck's share is larger than 90% today. The rationale for these exclusions is that the existing situation probably reflects some structural reason, such as the absence of rail service, which contributes to the prevalence of the truck mode. The RAC argues that it is unreasonable to use the existing situation to infer that it will forever be applicable in the future. Given a different policy context, the traffic could well be induced to shift, through options such as intermodal or transloads. Omitting this traffic once again restricts unnecessarily the assessment of the potential, and results in an under-estimation of the size of the contestable truck traffic opportunity.

As illustrated in the paper, previous work in this area was not comprehensive and serious data gaps exist. For this reason, the RAC has commenced a new study on contestable traffic drawing upon new road side survey data and railway data. Although the new data does not remove the significant analytical challenges discussed above, it will provide new insights. Both Environment Canada and Transport Canada have been invited to participate in this work. The goal of this

analysis is to provide an estimate and then to look at the quantitative impact of different policy scenarios. GHG emissions reduction will be an important element of this work.