The Railway Association of Canada
L'Association des chemins de fer du Canada

April 2, 2001

Reference: E.14

Office of the Commissioners
North American Commission for
Environmental Cooperation
200 – 393 rue St.-Jacques West
Montréal, QC
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Re: North American Trade and Transportation Corridors: Environmental Impacts and Mitigation Strategies, February 2110

This letter follows a careful deliberation on the findings of the ICF Consulting study, commissioned and recently made public by the North American Commission for Environmental Cooperation, to examine the environmental impacts of NAFTA trade on five bi-national segments of three primary NAFTA trade corridors, with a particular emphasis on air pollution emissions.

Please find attached the Railway Association of Canada's critical analysis of the report, in particular contesting numerous fundamental assumptions in its findings. Specifically, we show that the trucking/rail analysis contained therein is particularly biased and erroneous.

Also attached you will find two fact sheets indicating the current status of the pollutants of greenhouse gases, CO_2, VOC, and NO_x. The foundations of our corrections are the latest available statistics from *Transportation and Climate Change: Options for Action, Nov. 1999* and Environment Canada, 1995. These data clearly indicate that contrary to the statements in the report, rail is in every case, lower on these emission factors than trucks.

Yours sincerely,

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President and
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MH/rb

Attach.

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Critical Analysis

Paper

North American Trade and Transportation Corridors: Environmental Impacts and Mitigation Strategies, February, 2001

Prepared by: ICF Consulting for the North American Commission for Environmental Cooperation

1. Main Points in the Report

Freight traffic in five transportation corridors (Vancouver-Seattle, Winnipeg-Fargo, Toronto-Detroit, San Antonio-Monterrey and Tucson-Hermosillo) will double or even quadruple over the next 20 years.

Trade related emissions of carbon dioxide (CO2), a greenhouse gas, will increase by two to four times over current levels in the study corridors. Trade related emissions of nitrogen oxides (NOx) and particulates (PM) are expected to decline or stabilize. However, in some corridors rail emissions of NOx and PM will increase 50 to 100 per cent. This is because standards are less strict for locomotives and the replacement rate is slower than for trucks.

Increasing truck weights from 80,000 to 105,000 pounds and allowing Rocky Mountain Double longer combination vehicles would reduce pollution by four to seven per cent compared to business as usual, even if freight shifts from rail.

2. Critique on Critical Assumptions in the Report

- The report assumes that truck emissions of NOx and PM_{10} per tonne-kilometre will drop 900 per cent faster than rail emissions.[1] The assumption that support this finding are suspect because:

[1] Page ii states that truck NOx and PM are assumed to drop to $1/10^{th}$ of current level, or stated another way, improve by about a factor of 10. Emission factor tables for rail show improvement by about a factor of 1. Difference between factor of 10 and factor of 1 = 900% [(10-1)/1*100]. Another way to examine this is from the detailed comparisons in the report's emission factor tables. Emission factors for truck (table 4) are assumed to improve 830% for NOx and 1370% for PM. Emission factors for rail (table 6) are assumed to improve 92% for NOx and 69% for PM. The assumed difference truck vs rail for NOx = 830-92 = 738%. For PM, it is 1370-69 = 1301%

(1) **it assumes there will be little or no technological improvement in rail. This is contrary to several new industry driven initiatives which have the potential to reduce rail emissions. The following are a few examples of ongoing technological advancements:**

- *New locomotives:* Both CN and CPR have an aggressive campaign to replace older locomotives with newer high power more efficient units. When used in fleet these locomotives can generate up to a 20% reduction in fuel consumption
- *Automatic Shut Down Devices:* Both CN and CPR as well as many smaller operators have installed automotive devices which significantly reduce idling times and therefore provide a significant reduction in fuel consumption. Idling currently accounts for about 5% of overall railway fuel consumption.
- *Track Lubrication:* For many years, lubrication has been used to reduce friction losses between the wheel flange and the rail gauge face in curving. Increased utilization of this technology could reduce overall railway emissions.
- *Improvements in freight cars:* Improvements in freight cars can have a significant impact on overall railway sector emissions. Such improvements include:
  - *Aluminium body (or other lightweight) cars*
  - *Heavy axle load freight cars*
  - *Frame-based or steer able cars*

(2) **The report assumes that truck traffic on trade routes can double or triple without increasing emissions due to added congestion.** It must therefore assume significant highway expansion to handle this growth, which in itself will induce more traffic, emissions and land use changes. Adding lanes induces substantial new traffic.[2]

(3) **The report assumes that maintenance will follow manufacturers' schedules.** Evidence has shown that there are a large number of trucks in current operation that are not properly maintained. It is unlikely that this practice will change in the future. Poorly maintained trucks have considerably higher emissions.

(4) **The report assumes that new innovative avoidance schemes will not be used to bypass truck emission controls in certain operating situations.** It has recently come to light that devices have

[2] Mark Hansen, University of California, Berkeley, "Do New Highways Generate Traffic?", *Access*, fall 1995

been used to defeat truck emission controls in high speed cruise mode. This is just one of the reasons why actual emission reduction totals never seem to match lofty projections of significant reductions.

(5) **The report calculations assume that new engine standards are implemented by regulatory agencies without modification,** even though it notes "However, it is possible that implementation of the new standards will be delayed, and this would result in *considerably* higher 2020 emission factors for U.S. and Canadian trucks.

(6) **The report assumes that 92 per cent of the trucks in 2020 will have the new cleaner engines produced after 2007.** This may be based on new truck purchase rates experienced in the late 1990's, but there is currently a glut of used trucks and a collapse in sales of new trucks. It is hard to believe that entire truck fleet in 2020 will be composed of trucks produced after 2007. The report assumes that nearly all of the trucks built before 2007 are scrapped and removed from service. Long distance truck tractors often go through two or three owners. The third owner could be an owner-operator running high mileage on a low budget. There is a high demand to export used Canadian trucks to the U.S. and Mexico because of the exchange rate and high horsepower in the Canadian units. Thus, a new truck often *adds* to the pollution that continues somewhere else from the old truck.

(7) **The report assumes that truck weight can be increased 31 per cent (from 80,000 to 105,000 pounds) while increasing fuel usage by only two per cent.** It states that heavier and longer trucks would result in reduced emissions by allowing fewer trucks to carry the freight. Allowing heavier trucks in Canada in the late 1980's led to more, not fewer, trucks. The heavier trucks supplemented rather than supplanted existing trucks.

3. Presentational bias of the Report

The Executive Summary talks about truck emissions of NOx and PM dropping to one-tenth of current levels, but does not bring forward into the summary that rail emissions of CO and CO_2 -the most important GHG, will be one-tenth that of truck.

FACT SHEET
AIR CONTAMINANTS IN THE TRANSPORTATION SECTOR

- Transportation is the single largest source of GHG's in Canada (25%)
- Based on Environment Canada's data in 1997 commercial trucks produced 27% of Canada's GHG emissions while railways produced 4%

Figure 1
Sources of GHG Transportation Emissions, Canada
1997

Commercial Trucks	27%
Passenger Car and Light Truck	44%
Marine	4%
Aviation	7%
Off-Road	13%
Bus	1%
Rail Freight	4%
Total:	100%

Source: Transportation and Climate Change: Options for Action, Nov 1999

- In 1999, Canadian railways carried over 60% by volume of goods in Canada.
- These data clearly illustrate that rail offers significantly better energy utilization than trucking and therefore, have significantly lower GHG emissions (five times more fuel efficient)
- If trends continue, the Government of Canada estimates transportation emissions are expected to exceed 1990 levels 32% by 2010 and 53% by 2020. A shift from tucks to rail especially for long haul traffic would help reduce this increase.
- In the context of environmental stewardship and quality of life, emissions of types of air pollutants (carbon monoxide (C0), particulate matter (PM10), sulfur oxides (S0x), nitrogen oxides (N0x)and volatile organic compounds (VOC)) is another important environmental issue, especially in urban corridors. This problem can be exacerbated in conjunction with certain weather patterns and congested highways.
- As is the case in GHG emissions and is illustrated by the following tables rail's intrinsic fuel efficiency carries over into its emission of other types of air pollution.

Figure 2: Criteria Air Contaminants Emissions Intercity Truck versus Rail (tonnes), 1995*

Total	C0	PM10[1]	S0x	N0x	VOC
Intercity Trucks	118,521	16,938	17,325	199,773	25,633
Rail	21,449	2,922	7,038	112,598	5,462
Percentage Share					
Intercity Trucks	85%	85%	71%	64%	82%
Rail	15%	15%	29%	36%	18%
	139,973	19,860	24,363	312,371	31,095

*Source: Environment Canada, 1995 (latest data available). Note: (1) excludes emissions of coal dust

Figure 3: Criteria Air Contaminants Emissions Per Unit of Effort Truck versus Rail (grams per tonne km), 1995*

Total	C0	PM10[1]	S0x	N0x	VOC
Intercity Trucks	0.76	0.11	0.11	1.29	0.17
Rail	0.08	0.01	0.02	0.4	0.02
Ratio: Rail/ Intercity Trucks	1/10	1/10	1/5	1/3	1/8

*Source: Environment Canada, 1995. Note: (1) excludes emissions of coal dust

- Improving rail emissions of these types of air pollutants and increasing overall fuel efficiency is an important ongoing exercise for Canada's railways. Since 1990 railways' fuel consumption has declined by 1.9% annually. These gains have been brought about by a number of efficiency objectives.