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THE TRANSPORTATION OF FREIGHT BY ROAD IN CANADA

DEPARTMENT OF ECONOMICS AND POLITICAL SCIENCE

DOCTOR OF PHILOSOPHY

This thesis examines the Canadian Trucking Industry and forecasts possible growth.

In the past four decades, Canadian trucking has increased considerably. Road and rail competition has been keen, especially for higher-valued products. Road service advantage has been pitted against rail economic advantage. Road transport tends to be the shorter-haul carrier, while rail tends to be the longer-haul carrier.

The National Transportation Act, designed to foster competitive control of transportation to the greatest degree possible, appears to be more favourable than adverse toward road transport. Federal labour and safety legislation has, and will, increase costs for the Industry but technological and other changes would appear to offer benefits. Further, the Industry presents a fairly favourable financial situation.

A statistical projection suggests a 109.5 per cent increase in intercity net ton miles from 1963 to 1972, and a 79.0 per cent increase in urban net ton miles from 1963 to 1972.

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by

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PREFACE

The object of this thesis is to examine the Canadian Trucking Industry, to determine changes which are taking place and those which may take place in the future, and to attempt a projection of economic growth.

In the past four decades, the Trucking Industry in Canada has grown considerably. Severe competition has existed between road and rail transport. The service advantage of road transport has been effectively competitive in the short- and intermediate-haul markets, for goods of high value. The economic advantage of rail transport has enabled this mode of transport to be more effective in longer hauls.

There is a lack of documentation of material on road transport in Canada. Probably this is because of the atomistic nature of the Industry, which has been an important control factor. Also, the Industry has grown fairly rapidly. One study, made about 1959, on road/rail competition, was included in the MacPherson Royal Commission Report. To the writer's knowledge, a detailed study of the Trucking Industry and its future, as contained herein, has not been made. It is felt this thesis is necessary and useful because of the many changes which have been effected in recent years, and because of the dynamic nature of the transportation industries.

In addition to the overall study, it is believed that coverage of the following major subjects, in the form presented herein, constitute an original contribution. First, there is included an economic analysis of railway competitive rates and their effect on road transport. Second, there is an economic analysis of demand for road and rail transport in Canada. Third, an attempt is made to assess, from an overall point of view, the effect of the National Transportation Act and Federal labour legislation on road transport. Fourth, there is an examination of the possible effect of technological and other changes on the Industry. Fifth, a financial comparison of the Industry with other modes of transport, other Canadian industries, and United States carriers, is included. Sixth, there is calculated a statistical projection of the Industry's production to 1972. This is based on the Gross National Product in current dollars. There is also a geometric projection of the various components of the Industry.

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A.L. Dartnell.

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CHAPTER I

THE MOTOR VEHICLE AND TRUCKING IN CANADA

INTRODUCTION

In the past fifty years motor truck transportation has been an important factor in Canada's economic life. This thesis concerns the Canadian trucking industry and the more important factors affecting its future. Examination is undertaken of such matters as railway competitive rates, demand for road and rail transportation, Federal legislation, technological change and financial factors. Also, a mathematical projection is made of the industry. Economic analyses are included, where appropriate, and conclusions are advanced on the future of the industry. Before proceeding into an analysis of railway competitive rates in Chapter II, brief reference is made in this chapter to background information on motor vehicles and trucking statistics.

MOTOR VEHICLES

Motor Vehicles in Canada

The first motor vehicle appeared in Canada just before the turn of the century. In the intervening years there has been a fairly rapid increase in the numbers of vehicles, especially during the past two decades. By 1965 vehicles totalled 6.7 million, includ-

ing just over 5.3 million automobiles, 1.2 million motor trucks, and other commercial vehicles totalling 0.2 million.[1] In 1920 there were 21.0 persons per vehicle in Canada. By 1930 this figure had decreased to 8.2, but little change was registered in the next fifteen years. In 1945 this figure was 8.1 persons, but by 1965 the number of persons per vehicle had decreased to 2.9.[2]

Canadian motor vehicle data is impressive when compared with other ccuntries. In 1964, the latest figures available, four countries had a larger number of vehicles than Canada - the United States, France, the United Kingdom and West Germany. Only two countries had a smaller number of persons per vehicle than the 3.0 shown for Canada for 1964 - the United States with 2.2, and Monaco with 2.5.[3]

Reasons for Growth

There are various reasons why growth in motor vehicle numbers has been impressive in Canada, two of which are important. First, with the passage of time, the road network increased considerably. Appendix I indicates that there were 360.0 thousand miles of road in 1932. Seventy per cent of this total was earth road while thirty per cent was surfaced mileage. By 1965, total road mileage had increased to just under one-half million miles, seventy-three per cent of which was surfaced mileage. Of the surfaced roads, there were about 100,000 miles of paved roads, a tenfold increase since 1932, and over one-quarter of a million miles of gravel and other

treated surfaces.

While over the years significant increases were experienced in road mileage figures, vehicle-density ratios showed greater increases with the passage of time. Appendix I shows that surfaced roads increased 238.0 per cent from 1932 to 1965, yet the "all-vehicle" ratio increased from 10.3 per mile to 18.4. Commercial vehicles increased from 1.4 to 3.8 per mile.

It is recognized that there is a growth interaction between roads and vehicles. Frequently it has been necessary to travel over poor roads for extended periods before better facilities were provided. While often the good roads came later, as greater mileages of good roads became available the convenience and usefulness of the motor vehicle became more apparent, encouraging its greater use.

A second major factor which has, unquestionably, influenced the increase in motor vehicle numbers is the close proximity of the United States, where large numbers of motor vehicles have been manufactured. United States automobile manufacturers established subsidiary plants in Canada just around the turn of the century. This gave Canada access to a large body of research, technical and administrative knowledge in the automotive field.

It will be noted from Appendix II that Canada produced over three million vehicles from 1904 to 1940, an average of about 85.1 thousand a year. During the period 1941 to 1950, the average per year was about 234.3 thousand, while in the following decade, the yearly average increased to 414.7 thousand. In the period 1961 to 1965,

automotive production reached a peak, averaging 609.2 thousand vehicles annually. Appendix II also shows that up to 1950, Canada's foreign vehicle trade showed substantial net export figures, i.e., exports exceeded imports. Thereafter, significant net import figures were registered, especially for passenger automobiles. In earlier years, significant numbers of trucks and busses were exported, with a reversal of the trend in the 1950's and early 1960's. However, by 1963 net export figures were again shown for trucks.

This long history of vehicle production in Canada, for a country with a limited population, suggests the large amount of aid given and the influence the United States has had in this field.

MOTOR TRUCKS

Lack of Data

Between 1920 and 1955 the motor truck became a major form of transportation. It was performing an important function in the economy before there was a full realization of the lack of statistical data on traffic and other related material on this form of transport. No doubt this occurred because road transport was an atomistic type of industry and a minimum of regulation existed in the field. Quite a different situation existed with rail and water transport in which there has been considerable government financial participation. History is replete with government hearings, committees and royal commissions, especially on rail transport.[4] When road transport began

to make inroads on rail transport, the statistical dirth for trucking became apparent. While Dominion Bureau of Statistics has supplied financial data on trucking since 1941, and registration data for some years earlier, it was not until 1957 that detailed traffic information was made available. Due to processing, however, annual publication has been delayed after the collection of data. Further, unfortunately, because of a change in sampling procedures, 1964 data is not comparable in most respects to data for former years. Therefore, 1963 material must be used as the latest available in various instances.[5] One example is the data relating to tonnage handled.

Truck Registrations

By 1915 there were 500 trucks registered in Canada. Two years after World War I, this number had increased to just over 30,000, as shown in the table of registrations from 1920 to 1965, Appendix III, sheet one. In 1965 truck registrations totalled 1,205,457. Analysis of the growth in registrations from 1920 to 1965, reveals that approximately 25.8 per cent of the increase occurred up to 1944, while 74.2 per cent occurred thereafter. The annual geometric increase up to 1944 was 10.1 per cent, while after 1944 it was 6.8 per cent (see Appendix III, sheets three and four).

In 1920 trucks comprised 10.7 per cent of the total vehicles. By 1950 this figure had increased to 23.7 per cent but it declined thereafter to 18.0 per cent by 1965,[6] evidencing the more

rapid increase in passenger car numbers.

In 1920 the ratio of persons per truck in Canada was 199.0. By 1964 this had decreased to 16.2 persons. The latest comparison available shows that only two countries have a smaller amount - Australia and the United States - their ratios of persons per truck were 12.9 and 13.8, respectively.[7]

Motor Traffic in Canada

Tons of Goods Handled. Appendix IV, sheet one, reveals that 63.7 per cent of the total 891.8 million tons of freight in Canada in 1963 were handled by road transport. However, two-fifths of the tons handled by truck were transported in urban service. Of the 651.9 million total intercity tons of traffic shown, 29.8 per cent were handled by rail, the major competitor of road transport, while 53.5 per cent were handled by road, the latter handling eighty per cent more tons than rail in intercity service. However, net ton miles performed evidence a different picture.

Net Ton Miles Performed. Net ton miles are available for 1964 and 1965. Appendix IV, sheet two, reveals that of the total 208.6 billion ton miles performed in 1965, railways accounted for 87.2 billion, while trucks performed 19.4 billion. Truck net ton miles were just over twenty-two per cent of the rail total. Thus, while road transport carried eighty per cent more tons in 1963 than did rail transport, road freight was carried shorter distances than

that carried by rail. Using 1963 data, average miles per ton handled on the railways equalled 390, while for road transport the same average was only forty-eight miles.

Two further points of interest are observed in Appendix IV. First, sheet two indicates that between 1950 and 1965, there was a phenomenal growth in oil and gas pipeline mileage. By 1965 this mode of transport was performing 22.4 per cent of net ton miles.

Second, sheet three shows that in 1965 road transport in the United States performed almost one-quarter (22.5 per cent) of the intercity net ton miles. In Canada the proportion performed by road transport was approximately one-tenth (10.1 per cent) of the total. This difference would suggest that there is possibility for growth in the Canadian situation. However, there are some differences existing between the two countries. For example, during the winter season climatic conditions in Canada are more severe than further South. The Canadian population is only approximately one-tenth that of the United States but is dispersed over a land area fairly comparable to the United States area. The use of agreed charges by Canadian railways in more recent years (which subject is dealt with in Chapter II) has been a very competitive rail factor against road transport, inhibiting expansion. The highway system in the United States is much more extensive than in Canada and, thus, has encouraged road transport expansion in the United States. In drawing conclusions then these growth factors in the United States must be considered.

Distribution of Trucks by Class

Classes. For regulatory purposes there are four major or broad truck classifications. In intercity service there are two main categories. They are the for-hire carriers and private carriers. The for-hire group is subdivided into common carriers, which serve the public, and contract carriers, which supply their services under contract to one or a few individuals or corporate entities. Private carriers are those trucks which are used by firms for their own transport services. The remaining two major groups are urban vehicles, including both for-hire and private trucks, and farm trucks. It may even be contended that for-hire contract carriers are private carriers because they transport goods on a regular basis for only one or a few shippers. However, the shippers only hire the services of these contract carriers and this places the carrier in the for-hire category.

Truck and Traffic Distribution. Table I below shows the distribution of trucks and traffic by class in 1963.[8] Also shown is the data and percentage distribution for 1957.

TABLE I

TRUCKS, TONS CARRIED AND NET TON MILES PERFORMED AND PERCENTAGE DISTRIBUTION BY TRUCK CLASSIFICATION, CANADA, 1963, DATA FOR 1957 IS SHOWN IN BRACKETS

	For-Hire	Private Intercity	Urban	Farm	Total
Trucks	60,567 (46,344)	202,711 (214,992)	403,092 (278,891)	334,730 (291,828)	1,001,100 (832,055)
Per Cent) of Total)	6.1 (5.6)	20.2 (25.8)	40.3 (33.5)	33.4 (35.1)	100.0 (100.0)
Tons, Millions	188.2 (127.8)	122.1 (140.0)	219.6 (154.9)	38.5 (28.6)	568.4 (451.3)
Per Cent) of Total)	33.1 (28.4)	21.5 (31.0)	38.6 (34.3)	6.8 (6.3)	100.0 (100.0)
Net Ton Miles, Billions	12.0 (6.7)	4.3 (3.6)	1.9 (1.3)	0.5 (0.4)	18.7 (12.0)
Per Cent) of Total)	64.2 (55.8)	23.0 (30.0)	10.2 (10.8)	2.6 (3.3)	100.0 (100.0)

SOURCE: Dominion Bureau of Statistics, (hereafter referred to as D.B.S.), Motor Transport Traffic, National Estimates, 1958 and 1963.

Analysis of the above table reveals, first, that intercity for-hire trucks perform a large portion of the total service. Furthermore, since 1957 the proportion of for-hire trucks and service has increased. Second, that the proportion of private intercity service has decreased since 1957. While 1964 population

data are available, only tentative population data are available for 1965. A slight increase in the proportion of private intercity trucks is indicated. Appendix V shows that from 1963 to 1965 for-hire intercity trucks decreased from 23.0 per cent of total intercity trucks to 21.5 per cent, while private intercity trucks in the same period increased from 77.0 per cent of the total to 78.5 per cent. This could be indicating a reversal of the trend. Third, while urban trucks account for two-fifths of the total trucks and handle two-fifths of the total tons, they perform only just over ten per cent of the net ton miles. Fourth, farm trucks comprise one-third of the trucks but account for a very small proportion of the total tons and net ton miles.

Regional Distribution. Table II below shows, on a percentage basis, the regional distribution of truck registrations by class.

TABLE II

REGIONAL DISTRIBUTION OF REGISTRATIONS BY CLASS OF TRUCK, CANADA, 1963

Region	For-Hire	Private Intercity	Urban	Farm	Total
		Percentages			
Atlantic	3.0	14.9	8.5	3.7	7.8
Central	63.4	52.1	61.1	32.8	50.0
Western	33.6	33.0	30.4	63.5	42.2
Total	100.0	100.0	100.0	100.0	100.0

SOURCE: D.B.S., Motor Transport Traffic, National Estimates, 1963.

The above table indicates that a small percentage of for-hire trucks are in the four Atlantic Provinces. Undoubtedly this is due to the Maritime Freight Rates Act, which reduces rail freight rates by twenty per cent within the Maritimes and thirty per cent on freight being shipped to other parts of Canada. The reduction is borne by the Federal Treasury. Further comment is made on this subject in Chapter IV. The above table also reveals that there is a large proportion of for-hire trucks in the Central Provinces, where road-rail competition has been intensive, and, further, that almost two-thirds of the farm trucks are in the Western Provinces.

CONCLUSIONS

It may be concluded that Canada has a large motor vehicle population; that road transport handles many tons of goods for short distances; that for-hire trucks perform a good deal of the total service; and that the greater portion of these for-hire trucks are in the Central Provinces, while the great majority of farm trucks are in Western Canada.

FOOTNOTES FOR CHAPTER I

1 Dominion Bureau of Statistics (hereafter referred to as D.B.S.), The Motor Vehicle (Ottawa: Queen's Printer), Part III, 1965.

2 For the years 1920 and 1930 - Roads and Street Facts and Figures on Highways and Highway Transportation (Ottawa: Canadian Good Roads Association, 1954), p. 11; and D.B.S., The Motor Vehicle, Op. cit., 1945, and Part III, 1965, p. 14.

3 Automobile Facts and Figures (Detroit: Automobile Manufacturers Association), 1966 Edition, pp. 26-28.

4 Since 1917, the Federal Government has appointed six Royal Commissions on transportation problems, all of which dealt in large part with the Canadian railways. The Province of Ontario also had one Royal Commission on transportation. There have been at least six textbooks written by prominent writers, the contents of which dealt mainly with Canadian railways. In addition, statistics exist from before the turn of the century. These early data were compiled under the authority of the Minister of Railways for Canada.

5 Because of collection complexities, generally data has not been available for one and one-half to two years after collection. However, for 1964 national data was not available until April, 1967. When it became available, the following excerpts appeared in the text:

> ...As the national estimates have been produced for seven years on a total Canadian truck population basis, it was considered this is sufficient to obtain the trend of the impact of the trucking industry on the national economy and its relation to other modes of transport. The time was, therefore, considered appropriate to concentrate on that portion of the trucking industry which was in competition with the other modes of transport and therefore of most interest to users of transportation statistics.
>
> and
>
> The total truck population, miles travelled and fuel consumed are the only statistical items which can be compared with previous years...

D.B.S., Motor Transport Traffic, Canada (Ottawa: Queen's Printer), 1964, p. 10.

The reaction of the Canadian Trucking Associations, Inc., to the 1964 statistics was as follows:

> Canadian Trucking Associations has told the Dominion Bureau of Statistics that its 1964 trucking reports were grossly misleading and should be withdrawn.

"D.B.S. Statistics Are 'Grossly Misleading' Says C.T.A. Manager," Western Motor Fleet (Regina: Mercury Publications, Limited), April, 1966, p. 18.

6 D.B.S., The Highway, The Motor Vehicle and The Tourist in Canada (Ottawa: Queen's Printer), 1923; and D.B.S., The Motor Vehicle, Op. cit., 1950 and Part III, 1965.

7 Automobile Facts and Figures, Op. cit., 1966 Edition, pp. 26-28.

8 Tow trucks, hearses, ambulances, snowmobiles, farm tractors, cranes, bulldozers, diggers, graders and other road building equipment, military and government-owned vehicles and motor vehicles not requiring provincial licenses, are not included in the D.B.S. Motor Transport Traffic Survey. Approximately 120,000 vehicles are involved.

Tentative truck population data for 1964 is 1,033,000, and for 1965 is 1,072,800, indicating percentage increases over the previous year of 3.3 per cent and 4.0 per cent respectively. (See Appendix V for distribution of truck population).

Information obtained from D.B.S., Transportation and Public Utilities Division.

CHAPTER II

RAILWAY COMPETITIVE RATES

INTRODUCTION

The Road-Rail Competitive Situation

For many years the Canadian railway industry[1] enjoyed a monopoly position. Truck competition became evident in the 1930's, but with the intervention of World War II, large amounts of traffic were still available to the railways. They did not feel the full competitive effects of road transport until the late 1940's and early 1950's. In the earlier part of that period, even though the railways instituted various technological changes, they seemed to do no more than to fight a rearguard action as traffic was siphoned away by road transport. Examples of railway technological change were the acquisition of diesel locomotives, machines for maintenance-of-way work, new types of shop machinery, piggyback, modern devices in marshalling yards, improved signal devices, specialized freight cars and organizational changes.

There were various reasons why road transport made inroads on rail transport. In Chapter I, two of the major ones were mentioned, together with related data. It was observed that in Canada there are almost one-half million miles of road, of which about 360,000 miles are surfaced. Canada's close proximity to the

United States, with the attendant production benefits, was the second reason mentioned. This was reflected in Canada's long history of production of motor vehicles.

Other important factors which have aided road transport to compete with rail transport were national policy burdens placed on the railways, the railway freight rate structure, improvements and the increase in capacity of road equipment with the passage of time, door-to-door service, speed of operation, frequency of service and availability of truck transport. These service factors of road transport have enabled shippers and consignees to lower inventory costs by maintaining minimum inventory levels. With its fast service, road transport can make delivery of shipments on short notice.

Further, not only did road transport make inroads on rail transport but it inhibited the growth of rail transport in untapped areas. With the increase in the decentralization of industry, the versatility of road transport has enabled delivery of shipments to and from, and between, plants far removed from railway services.

When compared with the railways, however, road transport has a cost-of-service disadvantage which increases with distance. Rail long-run marginal costs are lower than those of road, as shown in the study by John R. Meyers and others. Even with a service differential added to rail costs, they are still lower than road costs beyond 100 miles.[2] George W. Wilson points out, however, that care must be exercised:

> ...when a particular figure is presented as 'the long-run marginal cost' for the whole output, it must be recognized that its relevance to transportation in general is limited by...inherently subjective choices ....Selecting different carriers, regions, years, or measurement units will yield different figures...[3]

Value-of-Service Pricing

While the railways enjoyed a cost advantage, their rate structure, based primarily on the value-of-service principle,[4] was geared to a railway monopoly era in which the railways were used as an instrument of development. The rates were related to the value which the shippers were willing to pay for the movement of their goods. Thus goods of high value bore a high rate while those low-valued, heavy, bulk commodities in many instances returned to the railway little more than out-of-pocket or direct cost. Price discrimination existed. Different rates were charged for two commodities receiving the same service. It meant that the major portion of constant (fixed) cost was borne by goods of high value. Under this pricing system, even though the cost could conceivably be the same to transport a car of gravel and a car of automobiles, the freight rate for the automobiles would be many times that of the rate for the gravel.

National development was aided by this value-of-service pricing system as low, bulk commodities were able to move economically. It benefited the railways also because they were decreasing-cost firms in their initial years at least. As heavy-density lines appear

and excess capacity disappears, the railway can tend to become more of a constant-cost firm. In any event, when trucks appeared in numbers, high-valued commodities, especially manufactured goods, became vulnerable to road transport.[5]

Road-Rail Market

Appendix VI shows the road-rail market for net ton miles and tons handled. Both of these indicators show that truck transportation expanded its share of the road-rail market up to the 1960-1961 period, registering a decreasing proportion thereafter, up to 1964. However, there was a slight increase in the proportion of road net ton miles in 1965. This could be signalling a levelling-out of the downward trend. Nevertheless, railway rate action has in part been responsible for the resurgence of rail transport.

STATISTICS RELATING TO RAILWAY RATES AND TRAFFIC

Changing Rate Patterns

During the 1950's, one competitive step taken by the railways was the greater use of competitive commodity rates and agreed charges.[6] For example, in 1955[7] there were in effect on the Canadian railways, ninety-five agreed charge contracts, covering 352 shippers. By 1965 contracts had increased to 1,610 in number, with 2,595 shippers involved.[8] Contracts had increased at an annual geometric rate of 32.7 per cent, while the number of shippers

increased at an annual rate of 22.1 per cent (see Appendix VII, sheets one and two for calculations).

Examination of railway traffic reveals that in 1954, the low point since 1952, 24.4 per cent of total tons were transported under competitive rates.[9] By 1965 this proportion had increased to 49.7 per cent.[10] In addition, in the same period an increase of 43.2 per cent was experienced in total tons. Further, examination of carload data for 1965 indicates that 57.7 per cent of carloads were moving under competitive rates.[11]

Sheets one and two of Appendix VIII contain an analysis of railway revenue. In 1954, 67.0 per cent of revenue was obtained from traffic bearing class and non-competitive commodity rates, rates primarily oriented to the value-of-service principle of rate-making. By 1965 this proportion had decreased to 33.9 per cent. On the other hand, traffic bearing competitive rates (competitive commodity rates and agreed charges) accounted for only 22.5 per cent of railway revenue in 1954. Eleven years later this proportion had increased to 55.7 per cent. Over the period, revenue from competitive commodity rates increased 158.0 per cent, while revenue from agreed charges increased 495.0 per cent.

From the foregoing data it may be concluded that competitive rates have taken a much more prominent role in railway pricing. The section which follows relates competitive rates with railway tonnage distributed on a commodity basis.

Railway Commodity Groups and Competitive Rates

Appendix IX, sheet one, contains data on railway freight tonnage by commodity groups, at two-year intervals from 1952 to 1964 and for the year 1965. Sheet two shows information on commodity group rate patterns for 1960 and 1964.

Examination of the commodity data for the period 1954 (the low point) to 1965, in Appendix IX, sheet one, reveals certain significant points in regard to mine, forest and manufactured products.

First, there was a 67.0 per cent increase in the total tons of mine products which were shipped. This was due in large measure to iron ore shipments in Central Canada, on railways such as the Cartier, and the Quebec, North Shore and Labrador, the latter of which commenced to ship in 1955. Of the 91.5 million tons of mine products shipped in 1965, 38.9 million tons were iron ore.[12] While mine products are bulk commodities, Appendix IX, sheet two, shows that from 1960 to 1964 the proportion of carloads of mine products moving at competitive rates increased from 30.8 per cent to 46.0 per cent. There was a significant increase in agreed charges and a decrease in competitive commodity rates.

Second, in the 1952-1965 period, the low point in tons of forest products shipped was reached in 1958. However, by 1965, they had almost returned to their 1952 level, the peak year of the period in question. Pulpwood and processed wood products (lumber, plywood,

shingles, crates and other similar products) decreased each year up to 1958, but subsequently thereto a recovery was made in both of these categories.[13] It is noted in Appendix IX, sheet two, that from 1960 to 1964 carloads of forest products moving at competitive rates increased from 47.9 per cent to 70.2 per cent.

Third, from 1954 to 1965 tons of manufactured and miscellaneous goods increased by just over 41.0 per cent. Appendix IX, sheet two, shows that by 1960 the proportion of competitive rates on manufactured goods was 76.3 per cent, increasing to 79.6 per cent by 1964.

Manufactured goods and processed forest products have been highly vulnerable to truck competition. This is indicated by the extensive use of competitive rates. The increase in tonnage for these types of manufactured and processed products would indicate that competitive rates have retained and to some extent have increased traffic for the railways.

There is some evidence to suggest that part of the increase in rail tonnage is due to economic prosperity. For example, Appendix IX, sheet one, reveals that during the 1952-1965 period total tons reached a low point in 1954 (143.2 million), as mentioned previously. Two years later, however, tonnage increased to 189.6 million tons but by 1958 a decline to 153.4 million tons was experienced. Thereafter continued growth was evidenced, a peak of 205.2 million tons being reached in 1965. A recently published preliminary figure indicates approximately 214.0 million tons of railway freight for

1966 (see Appendix IX, sheet one). Recessionary trends were evident in the nation's economy both in 1954 and 1958, with prosperity in the intervening period and continued growth from 1959 onward. Thus national economic trends have been similar to trends in railway tonnage. Competitive rates have, however, undoubtedly allowed rail transport to retain traffic as the economy expanded.

THE ECONOMIC EFFECTS

Shippers' Costs

Reduction of Shippers' Rates. With the extensive competitive rate action taken by the railways, the value-of-service principle as a guide in rate-making has become much less important, while the cost of producing the service has become much more important. There has been a tendency for value and cost to coalesce. There have been beneficial effects for the specific shippers involved. Their transportation costs have been reduced (or they have advanced to a lesser degree than would have otherwise been the case), so that they now are closer to the cost of the service provided. Formerly high-valued goods bore the major portion of overhead for the railways. In this way the shippers of these commodities were subsidizing the low-valued commodities. In actual fact they were bearing a progressive type of "tax" based on value, or ability to pay, as the value of the shipment was the major determinant in the rate.[14] One might consider that the situation which existed was somewhat analagous

to our personal progressive tax on income - the higher the salary, the greater the proportion paid on the additional dollars earned.

In any event, with the increase in competitive rates there has been a "tax" reduction accorded to the shipper of high-valued commodities. The economic gap existing between the former rates on these commodities and the cost of service has been diminished.

Revenue Per Ton Mile. Some broad indication of the effect of competitive rates on railway revenue is shown by the revenue per ton mile. The year chosen by the Government for the base year for a number of indicators was 1949. The economy in the post-war period had returned to a more normal peacetime basis. Therefore, using 1949 as the base year, Appendix X reveals that from 1.26 cents per ton mile, a peak of 1.56 cents was reached in 1959, at which time revenue per ton mile had increased 24.0 per cent. From the peak, revenue per ton mile decreased to 1.40 cents by 1964, only 11.0 per cent over 1949. The figure returned to 1.48 cents in 1965, an 11.7 per cent increase over 1949.

Examination of prices in general for the period 1949 to 1965, indicates a 26.3 per cent increase for wholesale prices and a 38.7 per cent increase for consumer prices.[15]

It is suggested that this decrease in railway revenue per ton mile after 1959 was in large measure due to the increase in the number of competitive rates on the railways.

It may be contended that reductions in the revenue per ton mile could result from subsidy action and/or product mix.

First, subsidies, which are mentioned later in this chapter and also discussed more fully in Chapter IV, have in large part been paid since 1959. Class and non-competitive commodity rates have been frozen since that time. Some of the subsidies paid have been reflected in the revenue per ton mile data; others have not.[16] Those included, would result in normal revenue data. Those not included, would prevent the data from rising beyond its peak. They would not, however, decrease it as their purpose was only to hold down railway freight rates.

Therefore, a reduction in revenue per ton mile after 1959 must have resulted from rate changes downward or a change in the product mix, i.e., an increase in the proportion of low-valued products as compared with high-valued products. While an increase in mine products has been witnessed, on which revenue per ton mile is low, there was a substantial offsetting increase in manufactured goods, the more lucrative type of traffic. Product mix may have had some effect, but it would not appear to have been a major factor. The evidence would suggest that reduced rates have been the reason for the reduction in the revenue per ton mile.

In summary then, as horizontal freight rate increases were being experienced during the late 1940's and the 1950's, revenue per ton mile increased. Thereafter when subsidies were paid to the railways (as noted, some were not included in the calculation),

and competitive rates became more widespread, revenue per ton mile decreased. It is also noted from Appendix X that revenue per ton mile of road transport was reduced from 7.3 cents in 1957 to 6.2 cents by 1961, returning to 6.8 cents by 1963.

When compared with the two national price indices mentioned, the lack of increase in revenue per ton mile for both road and rail transport evidences the competitive struggle waged. Out of this struggle has come a benefit to the shipper who had the choice of making his traffic available to either mode of transport and he was thus able to avail himself of competitive rates. The entry of the truck into the transportation field has brought about a competitive market giving benefit to a large body of shippers. Railway rates are, to a much larger degree than formerly, determined in the competitive market place.

Low-Valued Commodities

If shippers of high-valued merchandise have benefited from a rate reduction and they were formerly bearing a large portion of the constant cost for low-valued commodities moving under non-competitive commodity and statutory rates, the logical course of action would be to raise rates on these low-valued commodities to a point where long-run marginal costs for transport of such goods would be obtained by the railway.

First, statutory rates may be increased only by Parliament, but Parliament has not seen fit to make any change in these rates.

Second, as mentioned, the Government decided that no further freight rate increases beyond those levied in 1958 should be applied to class and non-competitive commodity rates until adjustments were made in the railways' overall competitive situation. Early in 1967 the necessary legislation was passed to accomplish the desired objectives. This subject is dealt with in Chapter IV. In the interim since 1959, the subsidies paid by the Government were aimed at relieving the burden of additional rate increases. Therefore, a portion of the subsidies was paid to relieve the railways from the deficiency suffered by not receiving long-run marginal cost from traffic under statutory and non-competitive commodity rates. This has resulted in the Government assuming the burden formerly borne by the shippers of high-valued merchandise.

Viewed in this light, one may consider that transportation development burdens and advancement of primary industries were in the past borne by a specific group of shippers. These burdens have now, in large measure, been lifted from these shippers by the pervasive use of competitive rates to compete with truck competition, and in part, at least, they have been placed with the nation as a whole by the payment of subsidies.

Government Payments - A Digression

Frequently railway subsidies have been criticized by such bodies as the Canadian Trucking Associations, Inc.[17] While subsidies are dealt with in Chapter IV, at this point brief reference will be

made to government payments for direct subsidies to railways and also expenditures on road facilities.

Appendix XIX, sheet one, indicates that during the fiscal year ended March 31, 1966, $110.5 million was paid in direct subsidies to the railways. The major part of these subsidies were of recent origin. Payments under the Maritime Freight Rates Act, which totalled $15.8 million in the year ended March 31, 1966, extend back to 1927. The "Bridge" Subsidy, which has been $7.0 million annually, was established in 1952. It has been used to reduce rail freight rates over Northern Ontario territory. In 1959 the Freight Rates Reduction Act was passed for the purpose of reducing class and non-competitive commodity rates. Since that time, up to $20.0 million has been made available annually for such payments. In 1961 a subsidy payment of $50.0 million was made available in lieu of recommendations advanced by the MacPherson Royal Commission. From 1959 to 1965 payments on behalf of these latter two subsidies totalled $362.4 million.[18] In 1964 a labour settlement was effected on the railways. A payment of $19.0 million was made to the railways by the Federal Government to replace increases in freight rates which may have been necessary. The next year a similar payment of $25.0 million was made. As is shown later, all of these subsidy payments, with the exception of the Maritime Freight Rates Act, have been replaced by a general subsidy which is being paid on a decreasing base.

Another Government payment arrangement which exists relates to the Canadian National Railways. If this Company sustains

a deficit the amount is made up by the Federal Treasury. If it has a surplus, it is paid into the Treasury. Net payments from 1923 to 1965 exceeded $1.0 billion.[19] This arrangement does not fall into the same category as those above because it is made for the purpose of carrying the huge debt which the Canadian National assumed when it took over a number of defunct railway lines.

Turning to road expenditures, Appendix XI shows that the total spent by all levels of government from 1949 to 1965, only sixteen years, was over $14.0 billion. Revenues from all motor vehicle sources totalled almost $8.3 billion. Thus the amount spent on roads exceeded revenues by about $5.7 billion, or 41.1 per cent of the total expenditures. The amount that each segment of road transport benefits from the government aid is difficult to determine. It has been a controversial question for many years, without agreement being reached, as to the benefit-payment relationship trucks and automobiles receive from road facilities.[20] While government aid for road facilities has been beneficial and essential, road transport has in a matter of sixteen years alone received considerable government aid. A much larger amount than that paid to railways.

The Base of the Competitive Rate

Compensatory Rates. Members of the trucking industry have on occasion suggested that railway rates are non-compensatory. In particular they have referred to agreed charges.[21] The inference is that with their extensive financial resources the railways would

maintain the low rates until the trucking competition was eliminated and then the railways would proceed to increase rates to excessive levels. Unquestionably this situation would be undesirable and quite unlikely to take place. With the truck available, the shippers would be quick to acquire either their own fleets or to use for-hire trucks again if uneconomic rail rates were experienced.

The railways, however, maintain that all rates are compensatory. For the purpose of rate-setting the railways use a formula which includes long-term variable costs. In exceptional cases, where the traffic is of a short-term nature, then short-term variable costs are used.[22] It could well be that rates are not necessarily returning a satisfactory level on invested dollars, but this is not the question posed by outside parties.

In the setting of road transport rates, tariff consultants and advisors use railway rates as one guide, plus various other economic features, including the cube factor.[23] Generally the practice is to accord some reduction wherever possible over the rail rate in order to attract the shipper. The Canadian Institute of Traffic and Transportation has pointed out the close relationship between road and rail rates.[24] If this interaction in setting rates exists then there must be some lower level to which the carriers will go.

Rate Base. For the trucking operation to remain viable in the long-run time period, it must offer a rate which is acceptable to the shipper. In this rate struggle between road and rail trans-

port, the lower level to which this competitive action can extend would be the long-run marginal cost of road transport (the higher-cost carrier), i.e., all costs which would vary with the shipment by truck over an extended period, would have to be covered. Further, if the railway, with its economic advantage, meets road transport rates, then the rail rates must be compensatory, or, if at that level they are not, then the road transport rates must not be compensatory.

From the cost information and the unit revenue data available, it would seem then that the railways should be able to proceed to a lower rate level than road transport and still remain within the level of their own long-run marginal costs. From the procedure of competitive rate-making described by railway officers, the base would be the rail long-run marginal cost, with the exception of cases where traffic is of a short-run nature and short-run variable cost is used.

In summary it would seem that the rail rate-making area differential for competitive rates in the short-run time period would lie between the rail short-run variable cost, or out-of-pocket cost, and the long-run marginal cost of the trucking operator. In the long-run time period the area would be between the rail long-run marginal cost and the road long-run marginal cost. In both instances the area differential within which the railways would be able to work

would increase with distance.

The gap or rate-making area differential for the two time periods would be exactly the same if full marginal costs were obtained in the short run. Failing this, the area differential in the short-run time period would be larger than that for the long-run time period.

While the area differentials exist for rail rate-making, it would appear that the principal base used is the long-run marginal cost of the trucking operation. In the short run, deviations could occur but the inexorable economic law of opportunity cost (the requirement of a return to all the factors of production as determined by the market), would take effect in the long run.

Effect on Road Transport

Road Transport Traffic. What has been the effect of competitive rates on road transport? While there is a paucity of information on road transport, especially for earlier years, Table III below shows for-hire and private intercity truck traffic by commodity groupings for 1961[25] and 1963.

TABLE III

TRAFFIC CARRIED BY FOR-HIRE AND PRIVATE INTERCITY TRUCKS, BY COMMODITY GROUPINGS, CANADA, 1961 AND 1963

Commodity Grouping	1961	1963	Average Distance Per Ton, 1963
	Millions of Tons		Miles
Livestock	3.0	2.7	104.7
Food, Feed, Beverages and Tobacco	31.2	34.0	95.1
Fabricated and End Products	78.8	89.9	71.8
Crude Materials (Wood, Coal, Sand, Gravel)	139.2	146.1	15.4
General Freight	30.3	37.5	107.5
Total	282.5	310.2	-

NOTE: Figures do not include Farm Trucks.

SOURCE: D.B.S., Motor Transport Traffic Survey, National Estimates, 1961 and 1963.

Very broadly, one might consider the three categories - food, feed, beverages and tobacco - fabricated and end products - and general freight - as being similar to high-valued manufactured, miscellaneous and processed goods transported by the railways. In 1963 these three categories accounted for 161.4 million tons or 52.0 per cent of the total 310.2 million tons. Of the three categories only general freight exceeded an average distance per ton of one

hundred miles, indicating that the transport of high-valued goods by road is confined primarily to the shorter distances.

The other major portion of tons handled by road transport was that of crude materials. These are similar to mine and some forest products transported by the railways. In 1963 crude materials transported by road totalled 146.1 million tons, or slightly more than 47.0 per cent of the total. The average distance per ton was exceedingly short - only 15.4 miles. This would suggest that road transport was complementing rather than competing with the railways in the transportation of these materials. This may be true in some cases but would not be true in others.

Distances. In Chapter III a very careful analysis is made of demand for road and rail transport in the short-, intermediate-, and long-haul fields. However, at this point it should be noted that the statistical data above indicates that road transport is confined to shorter hauls. This did not appear to be the trend after the railway strike of 1950 when value-of-service pricing was primarily in effect. For a number of years long-distance trucking was becoming quite prevalent and the railway companies were losing substantial amounts of tonnage in the longer-haul field. When the railways instituted competitive rates, there was a serious effect on road transport in distances where the rail economic advantage could be made effective.

There are some trucking operations which engage in longer hauls, one of which is Gill Interprovincial Lines, Ltd., Vancouver.

The General Manager[26] states that for longer distances L.T.L. (less-than-truckload lot) traffic is necessary for an economically sound operation. Higher rates may be charged on this type of traffic because it is the counterpart of L.C.L. (less-than-carload lot) and express traffic on the railways on which higher rates are charged. The trucking official referred to above stated that it is difficult to compete with railway competitive rates for longer-haul traffic. This same type of remark was made by various traffic managers (see Appendix XV). As is shown in Chapter III, however, road service advantage is extremely powerful for shorter distances.

L.C.L. and Express Traffic. Briefly, L.C.L. and express traffic in Canada is fairly limited but it is lucrative traffic. In 1965 L.C.L. traffic on the railways amounted to 1.2 million tons out of a total of 205.3 million tons, comprising just over one-half of one per cent.[27] Further, traffic volume statistics are not available for express shipments because of the fact that parcels and small lots cannot be readily classified into specific groups. For 1965, however, gross revenues of express companies in Canada totalled $84.0 million, of which Canadian National Railways and Canadian Pacific Railway Company earned $77.0 million.[28]

Possibly some liberty can be taken to piece together the information available to arrive at a very rough tonnage figure for L.C.L. and express. Proceeding on this basis, a recent article in The Financial Post[29] stated that the Canadian National Railways and

Canadian Pacific Railway Company earn about $150.0 million a year from L.C.L. and express. By extrapolation this same figure would be $164.0 million for Canada. Thus if approximately $80.0 million resulted from 1.2 million tons of L.C.L. ($164.0 - $84.0 = $80.0 million), then express revenues may be interpreted in terms of L.C.L. tonnage as about 1.4 million tons. Express rates would probably be a little higher than L.C.L., and, thus, the actual tonnage may be less than 1.4 million. In total, very roughly between 2.0 to 2.5 million tons of L.C.L. and express would probably be involved.

This tonnage information is not given on a distance basis and, furthermore, if the railways have retained this L.C.L. and express traffic until now, there must be a fairly inelastic demand for rail service. The major point here is to show the amount still being carried by rail. In the overall picture, it is not a large amount, but there is still a certain tonnage for which trucks can compete very effectively. In referring to express traffic, the President of the Canadian Trucking Associations, Inc., Mr. Georges C. Gouin, felt this tonnage was not insignificant.[30]

Changes Made. On September 5, 1967, the railways made effective changes in rates on small freight (L.C.L. and express). Some rates were increased and some were decreased. Also, various arrangements were made available to encourage shippers to combine small shipments. Where formerly eight factors were used for setting these types of rates, i.e., the value and interrelationship of commodities,

as well as various political and historical considerations, four new factors have been used. They are cost of service, density, damage risk, and "unusual" features. A weight division will be made between those shipments over 300 pounds and those under.[31]

Furniture Vans. One type of trucking which has been able to remain in the longer-distance field is the furniture van line.[32] The door-to-door operation and careful "pad" packing with trailers designed for secure stowage enables these companies to compete effectively, even though their rate is almost double that of the trucking operation handling L.T.L. freight.[33] There are three drawbacks to a movement of furniture by rail. The furniture must be crated, which is a costly operation. The in-transit time is generally lengthy. Also pick-up and delivery service is required at each end of the journey. By their service advantage van lines have been able to expand their operations in recent years.[34] This service advantage can be translated into economic and convenience factors. Thus while it may seem at first glance that the furniture van operation appears to charge a relatively high rate, when the total cost of household furniture shipment by rail is calculated, furniture van shipments are economically sound.

Summary. In summary it would seem that railway competitive rates have curtailed distance trucking and they have enabled the railways to use their economic advantage more effectively. Trucking has continued to expand in the short-haul field and will unquestionably

continue to do so. Horizons could, however, expand for distance trucking if long-haul costs can be decreased with the expansion of better highways, if heavier loads are permitted and if larger equipment is utilized.

SHOULD AGREED CHARGES BE ALLOWED?

Various bodies, when appearing before the Royal Commission on Agreed Charges, expressed opposition to the use of agreed charges in railway rate-making, among which was the Canadian Trucking Associations, Inc.[35] There were many reasons given why it was felt agreed charges should not be allowed on the railways, many of which related to discrimination of one sort or another, i.e., against certain shippers or other carriers. The trucking industry centered many of its criticisms around the fact that a shipper was bound for a period of time (at least one year). In one submission to the Government in 1963, the Canadian Trucking Associations, Inc., said:

> ...Canadian Trucking Associations has always held that railway agreed charges, as permitted under the Transport Act, are potent monopolistic weapons -- weapons by which competition against the railways can be weakened and eliminated and the monopolistic position of the railways re-established....[36]

While the agreed charge has been an effective weapon for the railways, for many years other modes of transport have been free to operate under contract rates. There are contract motor carriers, as well as chartered aeroplanes and ships. There would seem to be discrimination existing if the railways were denied the use of agreed

charge methods of pricing. Further, to prohibit the railways from using this method of rate-making would be to deny the shippers concerned a possibility for reduced transportation charges. A shipper should have the right to be able to enter into the contract or to refrain from doing so.

If it is possible for one carrier, such as the railways, to reduce rates to a level equal to or lower than others, such as road and water transport, there would seem to be no reason why they should not do so. Not to take such action because it may divert traffic from one carrier to another would be detrimental to the nation. First and foremost, the carrier should be the servant of the nation, not the nation the servant of the carrier. While trucking operations may have been curtailed to some extent in distance hauling, the industry has shown growth in the field where its service advantage enables it to compete. Further, the shipper is protected by the availability of motor transport should the railways endeavour to institute monopoly-type pricing. As mentioned, many shippers would no doubt quickly switch to private truck fleets and for-hire trucks would quickly expand their long-distance operations.

Competitive rates such as agreed charges have resulted in a much more competitive market, which is precisely the situation the MacPherson Royal Commission recommendations were designed to achieve. It would appear that the shippers have benefited from a much wider use of competitive rates.

THE FUTURE OF COMPETITIVE RATES

The possible expansion of competitive rates would seem to be limited but they will be a potent force in retaining traffic for the railways. In 1965 only 1.0 per cent of the tons shipped and 2.7 per cent of the carloads were transported at class rates, the type of traffic most vulnerable to road transport, apart from L.C.L. and express traffic. Non-competitive commodity rates comprised 31.6 per cent of tons handled.[37] This type of traffic, however, yields a lower revenue than competitive rate traffic.[38] Statutory rates accounted for 16.7 per cent of total tons[39] but these rates are controlled by Parliament.

The percentage increases in agreed charges from 1961 to 1965 were 10.7, 12.2, 6.8 and 4.2 respectively,[40] evidencing a decline in increase after 1963. It would seem now (1967) that major patterns for freight rates have been fairly well delineated. Probably any substantial expansion of competitive rates will be in regard to new traffic in the economy. In any event competitive rates have been of value to the nation by enabling a competitive market situation to exist. This should not be construed to mean that a healthy trucking industry is not important to the nation. It is. However, each mode of transport should be performing where the nation is receiving the greatest advantage possible.

In the chapter which follows there is an examination of the economics of demand for road and rail transport, which is closely bound up with the material in this chapter.

FOOTNOTES FOR CHAPTER II

1 From 1917 to 1923 the Canadian National Railways was formed from a number of financially embarrassed railways and also some lines which the Government had owned previously. From this time onward, the Canadian National and Canadian Pacific virtually comprised the industry. In addition, there are a number of small, local roads.

2 See Appendix XIII. The study was made by John R. Meyers and others and was included in The Economics of Competition in the Transportation Industries (Cambridge, Mass.: Harvard University Press, 1959), p. 190.

This material was based on a study in the United States from 1952 to 1955. It was shown that for all distance levels from fifty miles up, rail-boxcar long-run marginal costs were less than truck costs. For example, for a distance of fifty miles truck costs were 8.80 cents per ton mile, while rail costs were 6.88 cents. For 800 miles truck costs were 3.24 cents, while rail costs were 0.72 cents. Even adding a "service differential" cost, suffered by the shipper because of slower rail service, the rail costs per ton mile for 100 miles and beyond were less than truck costs.

3 George W. Wilson, "Essays on Some Unsettled Questions in the Economics of Transportation," Foundation for Economic and Business Studies (Graduate School of Business, Indiana University, 1962), p. 66.

4 For a discussion of the "value-of-service" principle see A.W. Currie's book Economics of Canadian Transportation (Toronto: University of Toronto Press, 1959), Second Edition, p. 161.

5 See Royal Commission Report on Transportation, 1959-1961, Three Volumes (Ottawa: Queen's Printer), Volume II, p. 46. (This Royal Commission is generally referred to as the MacPherson Royal Commission. Hereafter this title will be used).

6 There are five major categories of railway rates. They are:

1. Class Rates: Under class rates traffic is grouped into various classes and rates are set for each class. The present arrangement includes ten classes, with multiples in some of them. From a revenue point of view these are the highest rates but they are the foundation of the whole rate system.

2. Commodity Rates: Two of the major categories are included under this heading. They are non-competitive commodity rates and competitive commodity rates. As the names imply, they are rates set on particular commodities. In the first case they are non-competitive, but are set to move economically the low-valued, bulk commodities. The other type is set to compete with other forms of transport, especially road and water transport.

3. Agreed Charges: These are contract rates. A carrier agrees to accord a specific rate in return for the guarantee of transporting all or any part of the goods of a shipper or group of shippers. They are a variation of a competitive commodity rate.

4. Statutory Grain Rates: These are rates which apply to grain and grain products for export. They are set by statute of the Canadian Parliament.

NOTE: Agreed charges were imported from Britain and became legal for the Canadian railways in 1938, when the Transport Act was passed. (See Sections 32 and 33 of the Transport Act, Chapter 271, R.S. 1952). In 1954-1955 there was a Royal Commission on Agreed Charges. Prior to the Royal Commission, the approval of the Board of Transport Commissioners was required for agreed charges. After the Royal Commission, this provision was eliminated by Parliament but an agreed charge rate could be contested by a shipper or another carrier under Federal jurisdiction, the Board being the adjudicator. Other relaxations were also effected.

For a discussion on agreed charges see:

Report of the Royal Commission on Agreed Charges (Ottawa: Queen's Printer, 1955);

and

Motor Freight Transportation, Certificate Course, University of Toronto (Toronto: Canadian Institute of Traffic and Transportation), Chapter 18;

and

Minutes of Proceeding and Evidence, Standing Committee on Railways, Canals and Telegraph Lines, Senate Bill "B", 1937 and Bill 31, 1938 (Ottawa: Queen's Printer).

7 See footnote 6 above. From 1938 to 1950 application was made for approval of only forty-seven agreed charges, half of which were in effect by 1950. After 1955 greater flexibility was made in agreed charge procedures.

8 The Board of Transport Commissioners for Canada, Annual Reports (Ottawa: Queen's Printer), Years 1956-1965. (See Tariffs of Tolls).

9 The Board of Transport Commissioners for Canada, Waybill Analysis, Carload All-Rail Traffic (Ottawa: Queen's Printer), 1954, p. 3.

There was 1.8 per cent of tons shipped at mixed and multiple rates. It was not possible to distribute this tonnage over the other rate classes. Therefore, possibly competitive-type rates may have been slightly higher in proportion, as some of the 1.8 per cent would no doubt have been included with these rates.

10 The Board of Transport Commissioners for Canada, Waybill Analysis, Op. cit., 1965, p. 3.

11 Ibid.

12 D.B.S., Railway Freight Traffic (Ottawa: Queen's Printer), Year Ended December 31, 1965, pp. 11 and 41.

13 D.B.S., Canada Year Book (Ottawa: Queen's Printer), 1955, p. 839; 1959, p. 782; 1963-1964, p. 762; 1965, p. 768; and D.B.S., Railway Freight Traffic, Op. cit., Year Ended December 31, 1964, p. 12.

14 There were various other factors considered such as damage, political and historical factors, but there was a broad relationship between value and rates.

15 D.B.S., Canada Year Book, Op. cit., 1965, pp. 895 and 899; and D.B.S., Canadian Statistical Review (Ottawa: Queen's Printer), June, 1966, pp. 29-30.

Both indicies are based on 1949 = 100.

16 Reduced rates for Maritime freight are included in the ton mile figures. This has been the case for many years. Also, in 1964 no account is taken of the $50.0 million subsidy paid in lieu of the MacPherson Commission recommendations. In addition, in 1965 no account would be taken of the $19.0 million paid for the railway labour settlement. These various subsidies are listed in Appendix XIX.

17 Georges C. Gouin, "C.T.A. Reports," Maritime Truck Transport Review (Moncton, N.B.: Maritime Motor Transport Association), August, 1966, p. 13, and January, 1967, p.11.

18 The Board of Transport Commissioners for Canada, Annual Report, Op. cit., 1965, p. 13.

19 See Annual Reports of Canadian National Railways, 1923-1965.

20 See:

A Summary of the United States Highway Cost Allocation Study (Technical Publication No. 18. Ottawa: Canadian Good Roads Association, June, 1963);

and

United States Department of Transportation, The Highway Cost Allocation Study Supplementary Report, H. Doc. 124, 8th Congress, 1st Session (Washington: Superintendent of Documents, 1965);

and

John Rapp, University of South Dakota, Cost Allocation Revisited, Highway Research News (Washington, D.C.: Highway Research Board of the National Academy of Sciences - National Research Council, February, 1965), p. 11. Professor Rapp includes a good bibliography on highway costing matters.

21 Gordon Gates, "An Appeal to Nova Scotia - Truckers Present Case to Executive Council - Province of Nova Scotia." (Presentation on behalf of truckers made by Mr. Gates of the Maritime Motor Transport Association). Maritime Truck Transport Review (Moncton, N.B.: Maritime Motor Transport Association), December, 1964, p. 14;

and

"Railways Are Warned. Below Cost Rates To End With Coming Transport Legislation," Maritime Truck Transport Review (Moncton, N.B.: Maritime Motor Transport Association), August, 1966, p. 5;

and

Submission to The Cabinet Committee on Transportation (Ottawa: Canadian Trucking Associations, Inc., February, 1963), p. 3.4.

22 Department of Research, Canadian Pacific Railway Company, Montreal, December, 1967.

23 Mr. H.H. Williamson, Transport Tariff Advisor, North Burnaby, B.C., October, 1965. Cube factor - size in relation to density.

24 Certificate Course, Canadian Institute of Traffic and Transportation, Op. cit., Chapter 8, p. 7.

25 The first year the material was available in this form.

26 Mr. J. MacDuff, General Manager of Gill Interprovincial Lines, Ltd., Vancouver, B.C., June, 1966.

27 D.B.S., Railway Freight Traffic, Op. cit., Year Ended December 31, 1965, p. 15.

28 D.B.S., Railway Express (Ottawa: Queen's Printer), 1965; and Transport Review. (A Review Publication) (Ottawa: Canadian Trucking Associations, Inc.), January 6, 1967, p. 3.

29 "Freight May Cost You More," The Financial Post, June 17, 1965, p. 1.

30 Georges C. Gouin, Op. cit., Maritime Truck Transport Review, January, 1967, p. 11.

31 Tariff 100 (Montreal: The Express Traffic Association of Canada, September, 1967).

Reference was made to this arrangement in The Financial Post, September 2, 1967, p. 40.

The Association includes six companies - Canadian National Railways, Canadian Pacific Railway Company, Northern Alberta Railway Company, Ontario Northland Railway, Algoma Central Railway, and Railway Express Agency, Inc.

32 There are six major van line companies. They are actually comprised of a number of smaller agents in the various cities. These lines are Allied Van Lines, Ltd., North American Van Lines, United Van Lines (Canada), Ltd., Atlas Van Lines, Mayflower Van Lines, and Greyhound Van Lines. In each city there are also various independent van companies which operate in the long-haul field.

33 For example, as of 1965, the van line tariff charge per hundred pounds from Ottawa to Vancouver was $20.55. A freight carrier transporting L.T.L. goods would have charged approximately $11.50 per hundred pounds.

34 D.B.S. first published a separate report in 1960 for moving and storage of household goods. From the 1960 report, 163 companies reported total cartage and storage revenues of almost $31.0 million, or about an average of $190,000 per company. In 1963, 227 companies reported revenues of $45.9 million, averaging approximately $202,000 per company.

35 Report of The Royal Commission on Agreed Charges, Op. cit., pp. 26-33.

36 "Submission to The Cabinet Committee on Transportation," Canadian Trucking Associations, Inc., February, 1963, Op. cit., p. 3.9.

37 The Board of Transport Commissioners for Canada, Waybill Analysis, Op. cit., 1965, Table I.

38 In 1965 cents per ton mile for the rate classes were - class rates 3.95 cents, non-competitive commodity rates 1.44 cents, competitive commodity rates 2.61 cents, agreed charges 1.84 cents, and statutory grain rates 0.50 cents. Ibid., Table B.

39 Ibid., Table I.

40 The Board of Transport Commissioners for Canada, Annual Reports, Op. cit., 1961-1965.

As this thesis was ready for submission, information came to hand that in 1966, agreed charge contracts decreased to 1,504, with 2,457 shippers. The reason for this decrease was that ninety days before January 1, 1967, the railways cancelled all contracts and substituted new charges which included an increase of ten per cent. Signatures from 5,000 shippers were received but 732 shippers withdrew and 146 contracts were cancelled. From 1965 to 1966 the net decrease was 106 contracts. Therefore, there would have been an increase of forty, if the mass change had not been introduced.

See: The Board of Transport Commissioners for Canada, Annual Report, Op. cit., 1966, p. 23.

CHAPTER III

DEMAND FOR ROAD AND RAIL TRANSPORTATION

In Chapter II the road-rail competitive situation has been examined from a rate/cost point of view. The effectiveness of rail competitive rates, especially for longer distances, has been shown. This chapter deals with the interrelationship of road and rail transport demand.

DEMAND

Freight Transportation Demand

The demand for physical products requires in most instances that the products be moved from one location to another. Without transportation facilities, this could not be accomplished. Therefore, while transportation demand is not an end in itself, it is a link in the process of fulfilling demand for physical products and it is a derived demand.

Demand for transportation may be viewed in different ways. One could consider the aggregate transportation demand curve for the industry as a whole. This would be the sum total of a host of demand curves for the different products facing all carriers in the freight transportation industry in Canada. Taking a fragmented view, the demand curve for each individual carrier could be dissected into a large number of demand curves for the various products seeking transportation service.

The circumstances surrounding demand for each product are different. Distances are different, handling costs vary because many types of equipment, and loading and unloading facilities are required, and each commodity presents its own unique demand.

Further, different modes of transport encounter different costs for transporting the same goods over the same distance. Some find it more economical to operate in a particular distance field than do others. In view of the broad range of products existing (animals and animal products, mine, forest, agricultural, manufactured and miscellaneous products), the different costs and the different advantages and disadvantages relating to each mode of transport, different demand curves exist for each mode.

Where conditions for two modes of transportation are similar and substitution is possible, a high degree of competition will exist between them. Where one enjoys a distinct or outstanding advantage, then competition will tend to be less until the point is reached where the advantage is eliminated, or almost so, or other offsetting advantages emerge from the other mode of transport, equalizing the situation. In parts of the road-rail transportation market in Canada competition is exceptionally keen between road and rail transport while in other parts such is not the case. Thus, there is a wide variety of transportation demand curves existing in Canada, each evidencing its own degree of elasticity.

Elasticity and Cross-Elasticity

Elasticity. Demand may be described as an inverse relation between price and quantity. Price elasticity or elasticity relates to the change in quantity demanded as a result of a given price change. The slope of a demand curve gives an indication of the degree of elasticity existing. To measure more precisely the coefficient of elasticity of demand, the following formula may be used:

$$E = \frac{\Delta Q}{Q} \div \frac{\Delta P}{P}$$

i.e., the change in quantity divided by quantity demanded is divided by the change in price divided by price. This formula results in the relative change in quantity divided by the relative change in price.[1]

If the coefficient E is greater than one, demand is said to be elastic, or the relative change in quantity demanded is greater than the relative change in price. If elasticity is equal to one, it is considered to be unitary elasticity, and the relative changes in quantity and price are equal. If the coefficient is less than one and more than zero, it is considered to be inelastic. The relative change in quantity is less than the relative change in price. If the coefficient is zero, i.e., quantity demanded remains unchanged with price change, demand is perfectly inelastic.[2] (See Appendix XII re arc and point elasticity).

There are two aspects of elasticity of demand for transportation. First, as transportation is a derived demand, the overall

elasticity of demand will be determined by demand for the product, the ability of the product to bear costs and the possibility for close substitutes. For the same product in two different markets, overall elasticity will likely be different. For example, gravel for a residential building market and an industrial market would likely face quite different elasticities of demand because of the different possibilities for substitutes. There can be very complex relationships existing between the area of production and the area of consumption. Thus, the elasticity of demand will vary with these complex relationships.

Second, within the overall market demand, there can be the cross-elasticity of demand between the various substitutes within the market.

Cross-Elasticity. Within the confines of the overall market, the more perfectly one good may be substituted for another, the greater will be the elasticity of demand for the first one and, also, the greater will be the degree of cross-elasticity of demand, i.e., the greater will be the numerical value of the cross-elasticity coefficient.

Cross-elasticity expresses the relative change in the quantity of a good demanded as a result of a change in the price of another good. It may be measured by the following formula. Using products A and B, the cross-elasticity of demand for product A may be ascertained by:

$$E_{AP_B} = \frac{\Delta Q_A}{Q_A} \div \frac{\Delta P_B}{P_B}$$

The coefficient E_{AP_B} is, therefore, the relative change in the quantity demanded of product A divided by the relative change in the price of product B. Where cross-elasticity is numerically high, a relatively small change in the price of product B would result in a larger relative change in the price of product A.[3]

Road-Rail Elasticity and Cross-Elasticity. As stated, with a wide variety of transportation demand curves existing in Canada, a wide variety of elasticities of demand would be evidenced. Within the confines of the demand for the product, and where any transportation service enjoys a monopolistic position, the demand curve would express relative inelasticity. Where a competitive transportation situation exists, the demand curves facing the various modes of transport would be more elastic in nature and a high degree of cross-elasticity of demand would be in evidence. In such situations there would be a close relationship between the demand for one mode of transport and that of the freight rates of its competitor or competitors. Thus, in the road-rail transportation situation, increases or decreases in rail or road freight pricing, may or may not have an effect on the demand for the other mode of transport. It would depend on the possibility of substitution at the particular price levels concerned.

Cross-elasticity in the road-rail situation may then be expressed by the following formulae. For road transport demand the

formula would be:

$$E_{road\,P_{rail}} = \frac{\triangle Q_{road}}{Q_{road}} \div \frac{\triangle P_{rail}}{P_{rail}}$$

for rail transport, the formula would be:

$$E_{rail\,P_{road}} = \frac{\triangle Q_{rail}}{Q_{rail}} \div \frac{\triangle P_{road}}{P_{road}}$$

To understand better the demand for road and rail transportation in Canada, there follows a brief reference to total transportation.

TOTAL TRANSPORTATION DEMAND

Let us examine overall transportation demand and briefly refer to the relationship of road transport to the other modes. To aid us in this examination, the following percentage distribution of total net ton miles in 1965 was extracted from Appendix IV, sheet two:

Mode	-	Rail	Road	Water	Air	Oil Pipelines	Gas Pipelines	Total
Per Cent	-	41.8	9.3	26.5	*	14.3	8.1	100.0

* Less than one-tenth of one per cent.

Water Transportation

There are three areas where water transport is prevalent. They are the Atlantic Coast, the St. Lawrence Seaway and Great Lakes, and the Pacific Coast.

While water transport offers some competition to road transport in the areas mentioned, there are factors which limit the freight

involved. First, water transport tends to carry lower-valued freight, while road transport tends to carry higher-valued merchandise. Second, for a number of months during the winter period, inland waterways are not useable. Third, road transport attracts demand mainly because of its service advantage. Water transport is slow. Fourth, the areas mentioned for water transport are geographically limited. Navigable waterways for freight transport are more extensive in the United States than in Canada.

There are instances of water competition in Canada but such situations would seem to be limited. For example, steel is transported by water up the coast of Vancouver Island. Formerly this steel was transported by road.

Air Transport

Air transportation of higher-valued merchandise, over longer distances, has been growing in recent years, as is mentioned later. Competition is offered to both road and rail transport. While it is expected that air transport will grow, the net ton mile data shown above indicate that air transport is performing a very limited amount of the net ton miles of the overall market. Further, probably a significant amount of tonnage is being transported to the northern part of Canada. Therefore, while some tonnage is being competed away from road transport, it would appear to be a limited amount. Nevertheless, it is anticipated that in the years ahead the tonnage moved by air will increase significantly.

Oil and Gas Pipelines

Because of their nature and the products they are carrying, pipelines would not seem to be a significant competitor of road transport. Probably the indirect effects of pipelines on road transport are more pronounced than the direct effects. For example, where oil has replaced coal for heating, some trucking may be eliminated but such competition would probably affect rail transport more so than road transport. On the other hand, if oil pipelines reduce the cost of oil and gasoline for road transport, which they probably do, or if they at least restrain cost from rising, then road transport could compete more effectively.

Rail Transport

Rail transport penetrates all provinces of Canada and, as mentioned in Chapter II, there has been severe competition between road and rail carriers. At the present time, rail transport is the important competitor of road transport. Therefore, further analysis is made below of the demand for these modes of transport.

ROAD - RAIL INFORMATION

Data

The following data are used for our consideration of demand for road and rail transportation.

First, the Meyer study on long-run marginal cost, shown in

Appendix XIII, is used, but only in a general way. Cost related to distance for specific commodities can vary to some degree. George W. Wilson states:

> ....The Commission (Interstate Commerce Commission) has remarked that:
>
> 'In different situations there may be a considerable variation in the distance beyond which the railroads will be found to be the low-cost carrier. In Southern territory in 1950 rail carriers were found to be the low-cost carriers for distances in excess of 50 miles; in Illinois territory and truckline territory, rail carriers were found in 1951 and 1953 to be the low-cost carriers for distances in excess of 75 miles.'
>
> and
>
> Again in 'New Automobiles in Interstate Commerce', motor carriers were found to have lower costs for less than 400 miles. The Board of Investigation and Research, after a detailed study of transportation in the Lower Mississippi Valley, concluded that 'truckload costs are materially higher than rail carload costs for all distances above 100 miles. For shorter hauls, particularly within 60 miles, truckload and carload costs are the same.'
>
> and
>
> ...any blanket assertion applicable to all commodities... is distinctly misleading and irrelevant for rate-making for specific traffic.[4]

Furthermore, costs for specific traffic are changing from time to time. As a result, the aggregate cost is also changing. For example, consider the change in rail technology for transporting automobiles, which has reduced cost. Formerly, rail boxcars carrying only four automobiles were blocked with wood for shipment. Today automobiles are driven onto bi-level and tri-level railway cars, the largest of which carry as many as fifteen automobiles. The cost of blocking has

been eliminated by the use of chains. While special equipment is restricted in its usage, the railways, with these new cars, are likely to be more competitive for shorter distances. However, the overall road-rail technology has unlikely changed sufficiently to invalidate the use of the Meyer study for our purposes.

The second set of data is shown in Appendix XIV. Shown are the average distances road and rail traffic is transported, a related quotation, and revenue per ton mile.

Third, Appendix XV shows the number of tons of road and rail traffic in 1963, divided into higher-valued and lower-valued categories. Also shown is a distribution of tonnage on an average distance basis.

Two points for comment are: First, tonnage as a traffic indicator is used in this study because the analysis is made on three distance-market bases, i.e., the short-, intermediate-, and long-haul markets, to be defined later. The market is an indicator of the mileage factor. Analysis on a national aggregate basis would require ton miles in order to comprehend miles and tonnage.

Second, average distance data obtained from Dominion Bureau of Statistics publications and the Waybill Analysis are used. Some fairly broad decisions are made in dividing the road-rail traffic market on a distance basis. However, only rough proportions are shown. Therefore, this data is sufficient for our purpose.

One arbitrary decision which is made is that double the average distance shown will constitute the approximate upper limit of

the market for the particular traffic involved. For example, if the average distance is 100 miles, then the upper limit could possibly be in the area of 200 miles. It is realized that the lower and upper limits for one group of products could vary with those of another group and yet similar averages could result for the two. The average distance data must, therefore, be considered along with information contained in the other appendices.

One further point is that there are really no sharply delineated limits to any market. One person may consider the short-haul market to be 150 miles, while another may judge it to be 200 miles.

The fourth set of data is shown in Appendix XVI. Shown are the results of discussions with traffic officers on traffic distances and freight rate problems.

Appendix XVII indicates road mileages between various urban centres.

It should be noted that tonnage of both for-hire and private intercity transport are included in our analysis because, actually there is only a difference in ownership arrangement.

Major Conclusions From Data

Cost. In the aggregate, the long-run marginal cost of road transport is less than that of rail transport up to the distance of approximately 100 miles.

Distances. Appendix XIV, sheets one and two, shows that

products of higher value, i.e., food, feed, beverages, tobacco, livestock and manufactured goods, were transported average distances ranging from eighty-three to 104 miles. The average high distance for most commodities was 300 miles or less, with only one commodity (meat and meat preparations) exceeding this amount.

The overall average distances for rail transport ranged from 540 to 1,017 miles, with the high average for the various commodities ranging up to 3,000 miles.

Low-valued commodities, i.e., logs, pulpwood, ores, concentrates, coal, stone, gravel, and grain for rail transport,[5] are shown as crude materials in Appendices XIV and XV. These commodities moved an average distance of fifteen miles by road. The high average of any commodity was 320 miles, with most somewhat less than 100 miles.

Low-valued commodities were shipped an average of 205 miles by rail, much less than high-valued products. The high average was almost 3,500 miles, but many products registered high averages of 100 or 200 miles. Sulphur, rough lumber and coal were transported the longer distances.

One may conclude that low-valued commodities travel shorter distances than do high-valued commodities, indicating a lesser ability to absorb transportation costs. Also, road transport generally operates within shorter distances than does rail transport.

Revenues and Freight Rates. Appendix XIV indicates that

rail revenues per ton mile are considerably lower than those of road transport. Appendix XVI indicates that with the use of competitive rates, rail transport accords lower rates than does road transport. The substance of the interviews mentioned in Appendix XVI was that for long-distance, cross-country shipments, rail is primarily used and advantage is taken of agreed charges. For limited movements, road transport is used.

HIGH- AND LOW-VALUED COMMODITIES

Before discussing demand curves, comment should be made on high- and low-valued commodities.

As mentioned, high-valued products have a much greater ability to bear transportation costs than do low-valued products, which can affect the choice of carrier. For example, the freight rate for moving coal from point A to point B may be $4.00 a ton, while the selling value of the coal may be $15.00 a ton. On the other hand, the freight charge may be $10.00 to transport a television set from point A to point B, but the selling value of the set may range up to $900 or more.

Some earlier conclusions were that road transport has an economic advantage over rail transport up to a distance of 100 miles; that revenue per ton mile from road transport is significantly higher than that of rail transport; and that low-valued commodities generally travel shorter distances than do high-valued commodities. The strength of road transport, the high-cost mode, is its service advantage, which

allows minimum inventory costs and a decentralization of industry. The strength of rail transport is that as distance lengthens, its economic advantage increases.

Road transport service advantage is attractive to high-valued goods, as these commodities can bear higher rates for transportation. Thus, within certain distance limits, the shippers of high-valued goods seek the carrier with the service advantage up to the point where it is competitively possible for another mode to enter the market.

On the other hand, transportation costs are extremely important to commodities of low value. Rail transport has the economic advantage to offer rates sufficiently low so that these crude products are able to move longer distances to market. Generally, rail non-competitive rates apply. In 1965 non-competitive commodity rates on these products produced rail revenue per ton mile of 1.44 cents, compared with 2.61 cents for competitive commodity rates; 1.84 cents for agreed charge contracts; and 3.95 cents for class rates.[6] Further, Appendix XIV, sheet two, indicates that, including grain, the rail revenue per ton mile for crude materials was 1.2 cents, while for road transport it was 6.1 cents, or five times that of rail. Coupling these revenue data with that of the average distance data of fifteen miles for low-valued commodities (see Appendix XIV, sheet two), indicates, with present technology, the limitation of movement of crude material by road transport and the necessity of rail transport for low-valued commodities.

Further, while the speed of road transport is important to high-valued products because of inventory problems, the situation is not the same for low-valued commodities. In most instances the latter can be stockpiled in an open area nullifying, to a large extent, benefits which could be gained from a faster mode of transport. Inventory costs would be the fenced or open field area required for stockpiling and, in some instances, patrol activity is necessary. For example, with coal piles, spontaneous combustion can result in sporadic fires. In most instances handling of the low-valued commodities can take place with large mechanical shovels or cranes. Higher-valued products generally require buildings - often heated. Frequently, there is the possibility of spoilage of products and a need for careful handling. There is also the risk of pilferage.

In summary, rail transport is very suitable for low-valued commodities, but the flexibility of road transport is important for their movement for short distances and in locations where rail lines are not available.

MARKET DEMAND CURVES

Let us now consider market demand for road and rail transportation in Canada. Six general market situations are examined. These markets include three distance markets, i.e., the short-, intermediate-, and long-haul markets, for both high- and low-valued commodities. Because of the large range of products transported, many products would fall into an intermediate-value range between the high-

and low-valued categories. To take cognizance of such products, adjustments would be necessary in the demand situations postulated below.

To view the demand in each market for road and rail transport, total demand curves, as a function of price, follow. There is then shown separate series of road and rail curves, based upon the pricing policy of the competing mode.

TOTAL DEMAND CURVES

Total demand curves express the aggregate of individual demand curves of each product in a market, which curves are determined by a host of market factors. The individual market demand curve for each product determines the demand for transportation for that product and the elasticity of demand. This elasticity of demand for transportation for each product is determined by the possibility of close substitutes and, also, the ability of the product to bear freight costs. Therefore, the elasticity of demand for the total transportation demand curves which follow is determined by the elasticities of demand of the individual products comprising the market.

Distinguished from the total curves are the modal curves. They follow later. Each mode faces its own demand curves, the elasticity of which is determined by its own ability to price and its competitor's pricing policy, always, however, confined by the elasticity of total demand for the products being transported.

For both high- and low-valued commodities the three distance

markets will be discussed and then the total curves will be shown.

High-Valued Commodities - Distances, Proportions and Prices

Short-Haul Market - Distance and Proportions. Our short-haul market comprehends approximately 200 miles - about twice the overall average distance which high-valued traffic is transported by road. (See Appendix XIV). Various intercity trips entail distances of over 100 miles but do not exceed much more than 200 miles. Examples are: Montreal to Quebec, to Cornwall, to Ottawa, to Sherbrooke; Toronto to London, to Windsor, to Kingston, to Cornwall; Winnipeg to Brandon; Calgary to Edmonton; Regina to Saskatoon; and Vancouver to Penticton, and to Kamloops. There are many others.

Appendix XV, sheets two and four, indicates that for the suggested short-haul market road transport handled approximately 95.5 million tons of high-valued goods, while rail transport carried about 2.1 million tons.

Intermediate-Haul Market - Distance and Proportions. The intermediate-haul market would probably fall in the approximate 200 to 800 mile range. The MacPherson Commission report, in its third volume, discussed the subject of length of haul. It would seem the Commission's medium haul would possibly be about 500 or 600 miles.[7] This does not deviate greatly from the 800 miles suggested when one considers the improvement in roads and equipment in recent years. There are various urban centre runs which involve distances of 600 to 800 miles. For

example, the distance from Montreal to Halifax is about 840 miles, within the approximate intermediate range. From Montreal to Windsor, Ontario, it is almost 600 miles; from Sudbury to Fort William, just over 600 miles; from Winnipeg to Calgary, about 825 miles; and from Calgary to Vancouver, about 675 miles. Further, if a truck were travelling at an average speed of forty to forty-five miles an hour, a distance of about 800 miles could be traversed in from eighteen to twenty hours.

An article in The Financial Post[8] dealt with a road transport contract for hauling 12,000 lengths of pipe. While the article spoke of return trips, it stated that forty trucks were travelling up to 800 miles daily to Alberta and Saskatchewan points from Calgary. A spokesman for Gibbs Transport Company, Ltd., the Company involved, stated that while the actual cost of the road haul is higher than rail, only one loading and one unloading of pipe is required. Also, lower damage costs are involved. In this instance, these factors afford a lower market price for road transport than for rail transport.

While road traffic thins out beyond 500 miles, with present day possibilities for truck transport, 800 miles would not appear to be an excessive approximate mileage for the intermediate haul.

Appendix XV, sheets two and four, indicates that road transport carried 68.6 million tons in the postulated intermediate- and long-haul markets for high-valued goods, i.e., the tonnage was transported greater than an average distance of 100 miles.

There is not a division shown in the averages between our intermediate- and long-haul fields. One piece of information which will help to divide the tonnage between these two markets relates to interprovincial and international road traffic. In 1963 only 7.7 million tons, or 2.5 per cent of the total 310.2 million tons of for-hire and private intercity transport crossed one or more provincial borders.[9] Undoubtedly, of the total tonnage, this 2.5 per cent of tonnage was moved the greatest distance. Further, unless this traffic crossed a provincial border, it is unlikely the distance it was carried would exceed our postulated 800-mile intermediate-haul field. Some intra-provincial traffic could travel more than 800 miles in Ontario and Quebec but the amounts would not be great. For example, Toronto to Fort William would be about 870 miles, and Windsor to Fort William, about 1,114 miles. However, such instances are not numerous.

A rough analysis of the 7.7 million tons which crossed one or more provincial borders, indicates that between 2.5 and 3.0 million tons of the 7.7 million could probably have exceeded an approximate distance of 800 miles.[10] It has been decided to show a proportion of about 65.6 million tons of high-valued commodities for road transport in the intermediate-haul field and about 3.0 million for the long-haul field.

For the rail proportion, approximately 40.0 million tons will be used, that amount averaging between 100 and 400 miles in distance.

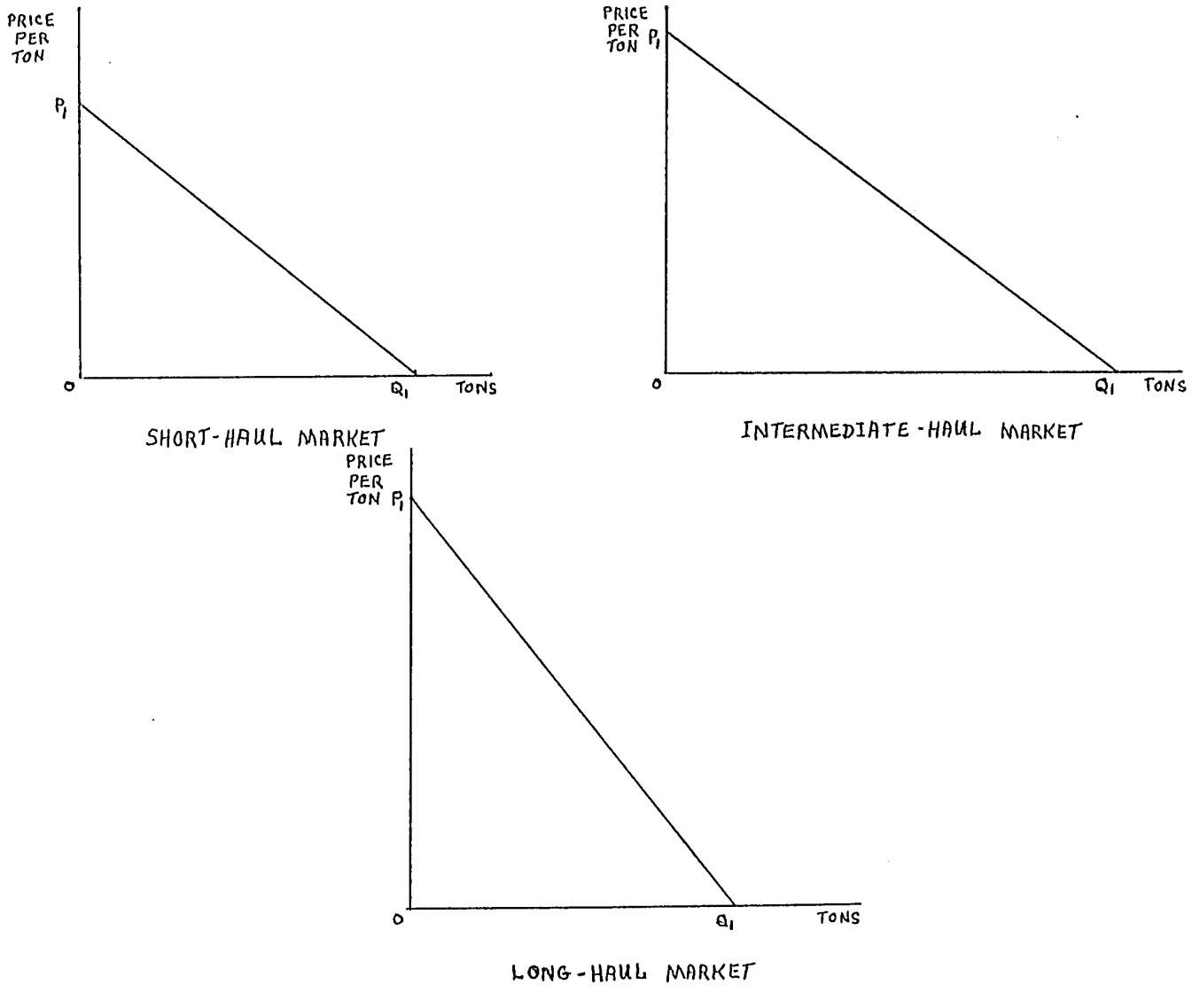
Long-Haul Market - Distance and Proportions. Our postulated

long-haul market would comprehend distances beyond approximately 800 miles. Road transport carried about 3.0 million tons of freight in this market, while Appendix XV, sheet four, shows that rail tonnage was almost 73.0 million.

Total tonnage for each market for both modes of transport is shown in the three curves in Figure I below.

FIGURE I

Road and Rail Total Demand Curves, High-Valued Commodities, Short-, Intermediate-, and Long-Haul Markets, Canada



Market Prices. The above curves are drawn to indicate market price differentials, as Appendix XIII indicates that costs increase with distance. Therefore, for comparable shipments, the rates would be higher in the long-haul market than in the intermediate-haul market, with the lowest rates in the short-haul market.[11]

In summary, it will also be noted that in the above curves the largest tonnage proportion is in the intermediate-haul market, and that the smallest proportion is in the long-haul market. Further, the slope of the short-haul curve is similar to that of the intermediate-haul curve, while that of the long-haul curve is more steeply inclined.

Low-Valued Commodities - Distances, Proportions and Prices

Short-Haul Market - Distance and Proportions. As in the high-valued commodity market, our short-haul market is about 200 miles. Appendix XV, sheets two and four, indicates that 98.1 per cent of road tonnage - 143.3 million tons - was carried an average distance of less than 100 miles. About one-fifth, or 18.0 million tons, of rail traffic was included in this market.

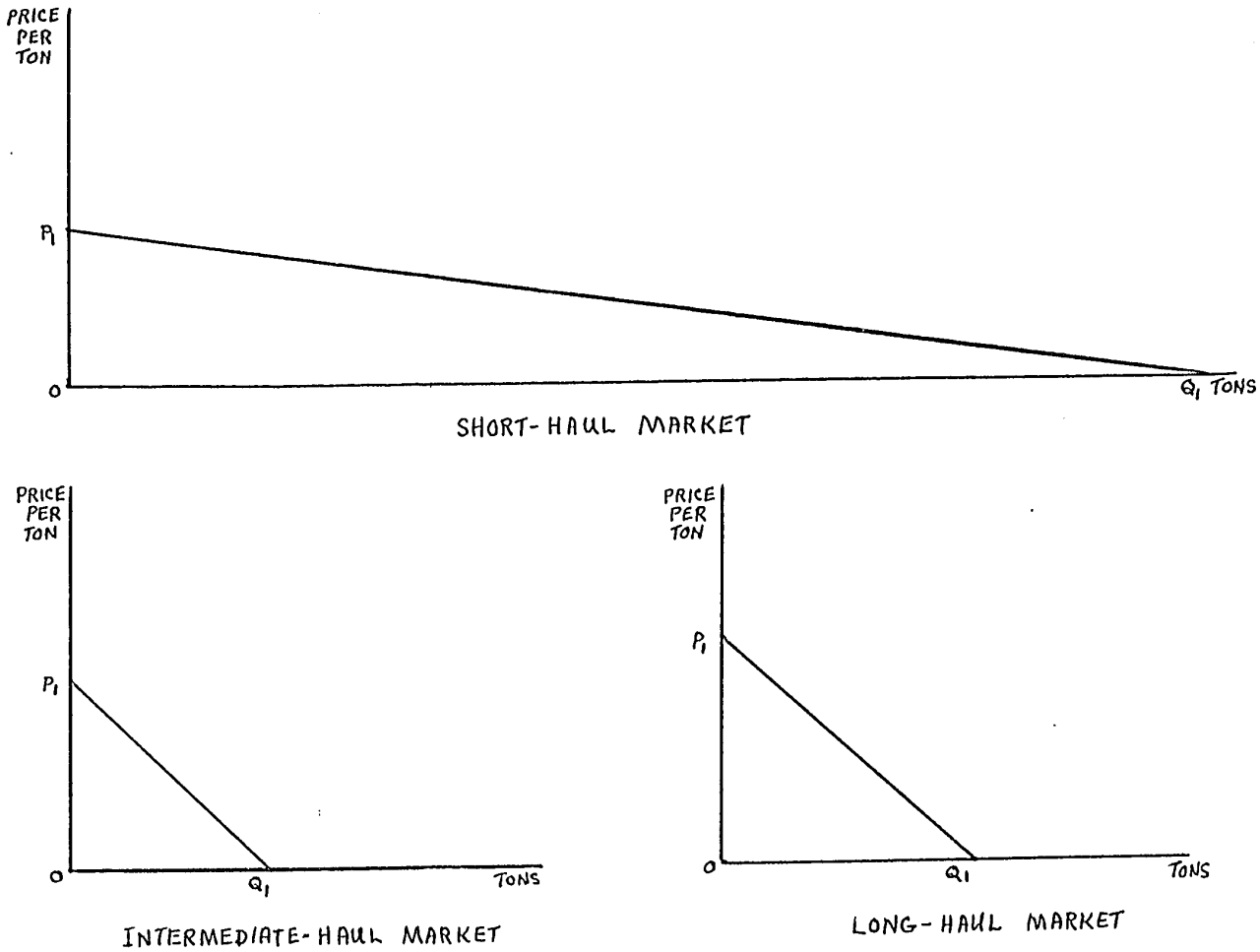
Intermediate-Haul Market - Distance and Proportions. As formerly, the intermediate-haul market would range from approximately 200 to 800 miles. Appendix XV, sheet two, indicates that only about two per cent, or approximately 3.0 million tons of low-valued commodities were moved by road in the intermediate haul. Sheet four of the same Appendix indicates that about thirty-two per cent, or 25.0 million tons were transported by rail in this market.

Long-Haul Market - Distance and Proportions. Our long-haul market would exceed approximately 800 miles. Appendix XV, sheet two, indicates that road transport would not be handling low-valued traffic in this distance range. Sheet four, of the same Appendix, indicates that rail transport handled about 35.0 million tons in this market.

Below, in Figure II, are the three market curves for low-valued commodities.

FIGURE II

Road and Rail Total Demand Curves, Low-Valued Commodities, Short-, Intermediate-, and Long-Haul Markets, Canada



Market Prices. Because of the lesser ability of low-valued goods to bear freight costs than those of high value, the total demand curves, in Figure II above, are drawn at lower levels than those in the high-valued goods market. To illustrate the difference in price levels take, for example, road trips up to fifty miles. Livestock produced revenue per ton mile of 20.1 cents; food, feed, beverages and tobacco, 17.8 cents; manufactured materials, 10.1 cents; inedible products (e.g., automobiles), 35.7 cents; and general freight, 24.9 cents. In the same distance range, low-valued commodities produced 7.3 cents revenue per ton mile.[12] For rail transport, the revenue per ton mile for manufactured and miscellaneous commodities was 2.49 cents, while for mine products it was 1.12 cents.[13]

Because low-valued commodities cannot bear relatively high freight costs, they evidence greater elasticity of demand than do high-valued commodities. In the curves above, the tonnage proportions have been drawn at one and one-half times the proportions for high-valued goods. This emphasizes the increase in elasticity.

It will be noted that the slope of the short-haul curve is much less steep than the other curves shown. This indicates that a relatively small increase in price results in a relatively large decrease in quantity demanded.

In summary, the high-valued commodity market indicates a total tonnage of about 280 million tons, fairly well distributed over the three distance markets. The low-valued commodity market had a tonnage of about 225 million tons, of which approximately 161 million

tons, or about seventy-one per cent was transported in the short-haul market.

MODAL DEMAND CURVES

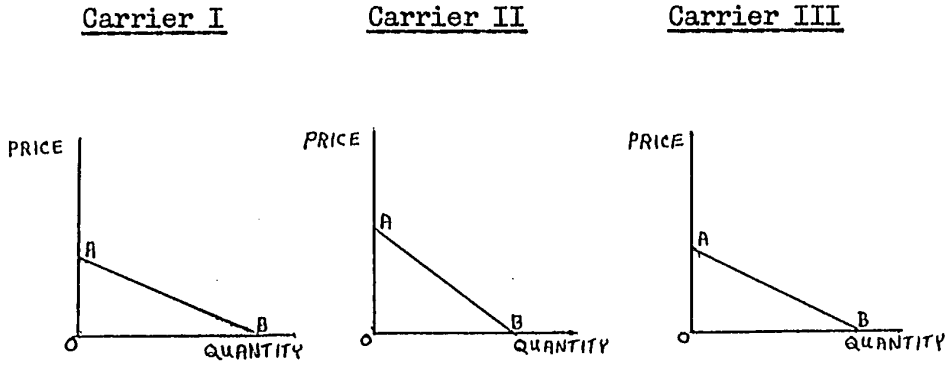
The total curves as a function of price have been depicted. Examination of modal curves as a function of the pricing policy of the competing mode will now be undertaken.

Before proceeding with the analysis of the road and rail transport curves, brief reference will be made to some demand curves which may exist in the various markets. Because of the variety of situations, there are possibly markets of monopolistic competition (urban areas), oligopoly, and areas of monopoly for both road and rail transport.

First, in the case of monopolistic competition where a number of carriers are operating and there is a differentiation of service, each carrier would face its own particular demand curve, which would be fairly elastic, indicating the possibility for substitution. These curves could be similar to the following:

FIGURE III

Monopolistic Competition Demand Curves

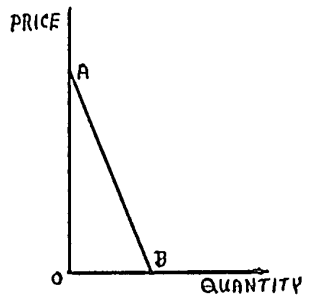


The two most prominent types of market situations are oligopoly and monopoly. Governments in the regulation of intercity routes generally restrict the number of trucking companies operating in an area. The number varies depending on the province. In addition, there may be railway lines penetrating the area. In such situations oligopoly exists. There are areas of monopoly, however, where only one truck line or one rail line enters an area. For example, the Quebec, North Shore and Labrador Railway is the only vehicle for ore transportation from its base. Also, there are many areas served by one truck line.

In intercity service, at least for a limited time period, both road and rail transport have monopoly positions in portions of their market operations. In such instances, the mode concerned would face a relatively inelastic downward-sloping demand curve, such as the following:

FIGURE IV

Monopoly Demand Curve

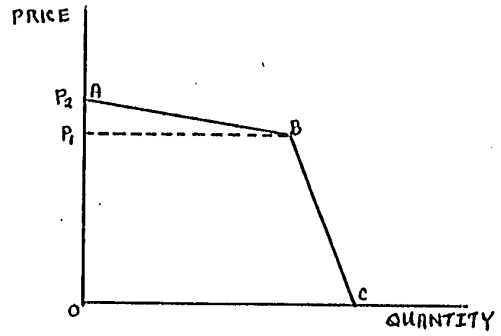


In other portions of the same market area, a mode of transport may have some monopoly attachment within a price range because of

the service advantage in the case of road transport or the economic advantage in the case of rail transport. However, should the price rise sufficiently, another mode may be able to successfully enter this market area. Thus the original mode could be facing a kinked demand curve, similar to the following:

FIGURE V

Oligopoly Kinked Demand Curve



It will be noted that there are two portions to the demand curve, i.e., from point C to point B, or up to price level P_1, and the portion from point B to point A, above price level P_1. The slope of the portion BC is steeper than that of portion AB. The latter portion is more elastic than the former, because it expresses the greater possibility for substitution. A mode of transport may enjoy a service or economic advantage over another mode, within a certain price range, i.e., in this case, up to P_1. This would result in the less elastic portion of the curve - BC. However, if the particular mode increased its price beyond P_1, a critical threshhold, it could expect to lose sizeable amounts of traffic because of the possibility of substitution. There would be an appropriate shift in the demand curve of the competing

mode.[14]

The critical threshhold at P_1 price level would be a general price area rather than a sharply-delineated threshhold, because of the large number of products involved.

The price on the vertical axis would include all explicit and implicit costs with which the shipper or consignee would be faced to have commodities available for the particular functions for which they were obtained. Therefore, the point where a shipper is willing to substitute road transport for rail transport, or vice versa, would be where all the costs for one mode would exceed all the costs for the other mode. A kinked demand curve, as described above, exists in a situation where two, or a few, sellers are involved.[15]

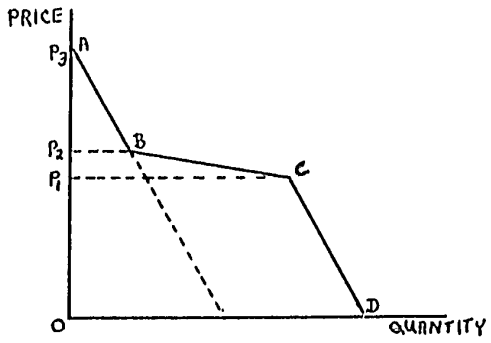
It is suggested that this oligopoly type of curve exists to a considerable extent in the road-rail market in Canada. First, road and rail transport have been competing for about four decades. These industries are established. Second, discussions with road transport tariff advisors revealed that road transport rates increase from all economic factors and may, or may not, increase when rail increases occur.[16] There appears to be no definite pattern and, thus, the railways cannot be certain of a road price change when their own rates are increased. On the present basis of price-setting, should a build-up of costs occur for road transport, and an increase in road price takes place after a rail increase, then it is suggested the kink would move to a higher position. One tariff advisor stated that on certain occasions when the railways increase their rates beyond the critical

threshhold and they find that road transport rates are not increased, then the railways will reduce their rates to compete for the traffic involved.

In a particular market, a mode of transport may face a downward-sloping demand curve for part of its traffic and a kinked demand curve for the other part of its traffic. The demand curve that it would then face would be a combined downward-sloping curve and a kinked curve, such as follows:

FIGURE VI

Combined Monopoly and Kinked Demand Curves



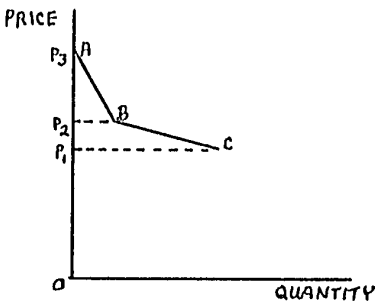
The demand curve would be ABCD. As will be noted shortly, this type of curve is suggested for a number of the postulated market situations which follow.

There is also the market condition where one mode of transport cannot operate profitably below a certain price level. Nevertheless, at that certain price level it can enter the market and compete effectively. The price level at which it can enter is the price level at which the kink occurs in the demand curve or the critical threshhold of the competing mode of transport, i.e., P_1 in the diagram below. The

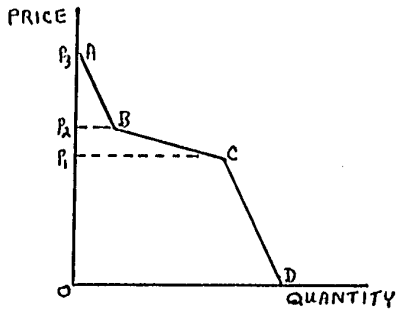
portion of its curve from point C to point B will be fairly elastic, up to price level P_2. However, because of some monopoly attachment in the limited time period, the AB portion is more steeply inclined than the BC portion. The suggested curve would be a reverse kink as follows:

FIGURE VII

Reverse Kink Curve



Curve of Competing Mode



ROAD DEMAND CURVES

Urban Transport

Road transport in urban centres supplies the transportation service for movement of goods. In most larger urban centres, the road transport industry comprises a fairly large number of operators and, thus, monopolistic competition frequently is the existing market arrangement. The demand curves would be similar to those shown in Figure III, page 68.

Intercity Road Transport

What are some of the possible demand curves facing road

transport in intercity service? The service advantage of road transport has resulted in the elimination of many small railway stations throughout Canada. Local monopolies have resulted for road transport. It is claimed by Canadian Trucking Associations, Inc., that there are at least 14,000 communities in Canada serviced only by road. Further, many of these communities, which are at a distance from rail lines, would have the service of only one truck line and very limited private trucking. While private trucking can be expanded in some situations, there is a limit in that probably only larger organizations can utilize it to any extent because of volume limitations for smaller shippers. In any event, both types of trucking are included in our tonnage data for comparison purposes.

Where these local monopoly situations exist, road transport would face a downward-sloping demand curve, as shown in Figure IV, page 69. In such instances, the slope of the curve would be determined by the elasticity of demand for the products transported and the ability of those products to bear freight costs.

While road transport holds monopoly positions in certain instances, there are other cases where it faces a kinked demand curve, as shown in Figure V, page 70.

If part of a market is of a monopoly nature, with a downward-sloping curve, and part is oligopolistic, which involves a kinked demand curve, then a combined kinked and reverse kink curve results, as shown in Figure VI, page 72.

For longer distances, where road transport can only compete at higher price levels, a reverse kink occurs, a more elastic portion occuring for traffic for which it can compete, i.e., portion BC, and a small part being of a monopoly nature, i.e., portion AB. This type of curve is shown in Figure VII, page 73.

There may also be a market in which road transport does not now operate but the possibility would exist for it to enter the market should the price level be sufficiently high. In such circumstances a fairly elastic, downward-sloping demand curve would exist.

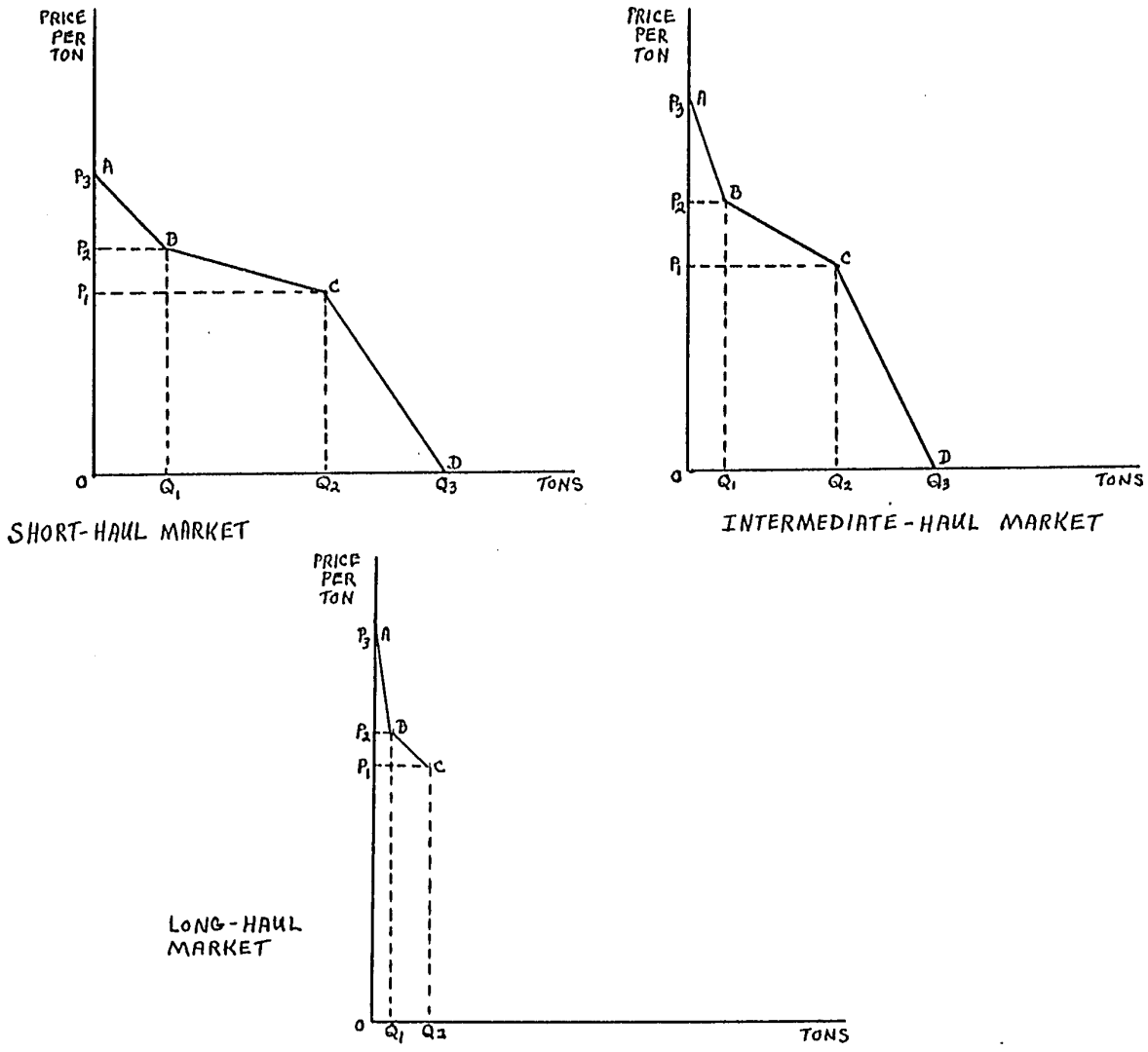
Now that the various possibilities for road transport have been considered, let us look at the curves existing in our six postulated markets.

High-Valued Commodities. The suggested road transport curves for high-valued commodities are shown below in Figure VIII. They are based on the tonnage proportions mentioned previously in this chapter.

It will be observed that the demand curves shown for the short- and intermediate-haul markets are combined kinked and reverse kink curves. While the explanations of these curves are the same, the specific slopes of the curves are different. A reverse kink curve is shown for the long-haul market.

FIGURE VIII

Road Transport Demand Curves, High-Valued Commodities, Short-, Intermediate-, and Long-Haul Markets, Canada



In the short-haul market road transport carried 95.5 million tons, while rail transport carried 2.1 million tons. This signifies the importance of the service advantage of road transport and its benefit for high-valued commodities, particularly in the short haul. A weakening of road transport service advantage and a strengthening of

rail transport economic advantage is indicated in the intermediate haul, as 65.6 million tons were handled by road transport, while rail transport handled 40.0 million tons.

While the superior service advantage of road transport diminishes with the lengthening of distance, and the economic advantage of rail transport increases, the service advantage of road transport is of importance to many shippers of high-valued commodities. Also, there are many locations where rail transport is either not available or very poorly located from the shipper's viewpoint. Road transport, therefore, still experiences demand for its service in the intermediate-haul market. On the other hand, the increase in rail economic advantage enables the extension of competitive rates. Rail piggyback, containerization and other technological innovations become more effective for railways, aiding their competitive strength. There is then in the intermediate haul a more equally competitive market than in the short haul.

The above short- and intermediate-haul market curves are based on the explicit assumptions that road transport can retain tonnage provided it prices only up to the critical threshhold level or to the kink in the curve. However, should road transport pricing exceed this general area, rail transport could successfully enter the market and compete. Elasticity and cross-elasticity of demand would both increase. At higher price levels there exists a monopoly situation for a small portion of the traffic, at least for the limited time period.

The portion of the curves from point D to point C, up to price level P_1, for both the short- and the intermediate-haul curves, is less elastic than the portion BC. This is brought about by the service advantage of road transport. For the traffic concerned, rail transport cannot compete successfully below price level P_1. General price level P_1 would be a sufficiently high level of all road explicit and implicit costs to allow rail transport to compete. Any variation or change in price upward, beyond the critical threshhold, would result in the road price exceeding the rail price. Thus, to retain traffic, road transport would price at the general threshhold price level of P_1 or below. To exceed this level would result in lost traffic.

Because of the possibility of rail transport entering the road market at the general level of P_1, a kink would occur in each curve, and the BC portion in each case would be less steeply inclined. This portion would become more elastic than the CD portion. There is an interdependence between road and rail transport for traffic in the BC portion of both road curves, i.e., between price levels P_1 and P_2. If road price were increased between P_1 and P_2, the lost tonnage would be taken by rail transport and an appropriate shift would result in the rail curve. In the BC portion of the road curves cross-elasticity is greater than at points below point B.

However, in the limited time period at least, where rail service would not be available, the tonnage relating to the portion of the curve from point B to point A, would be of a monopoly nature. The slopes of the demand curves in the AB portions would become more steeply

inclined, and a reverse kink would result at point B. Cross-elasticity would be less than at points between B and C.

Theoretically, this monopoly situation would exist only for a limited time because it could be argued that over a longer period, rail transport could be enticed into these monopoly areas if price were sufficiently high. In practice, it is not likely that rail transport would enter such areas because of the many problems railways have faced in the past with line abandonments. Furthermore, probably governmental control and other action, such as subsidies, would prevent relatively high price levels. In addition, an increase in competition within the road transport industry itself and substitution of private carriage, wherever possible, would, undoubtedly, control rates.

The appearance of the kinks in these curves would be determined by the competition available from rail transport, within the overall confines of the total demand curve, which in turn would be determined by the demand for the various products.

The intermediate-haul market, for high-valued goods, is probably the most competitive area of the six markets examined. The competitive ability of road and rail transport is equalized in this area more than any other.

As stated, for the road transport long-haul, high-valued commodity curve, a reverse kink is shown. A very small tonnage propor-

tion is involved.

Below price level P_1, road transport cannot compete in the long-haul market. In Chapter II it was mentioned that the profitable type of freight for road transport in the long haul is that which is equivalent to L.C.L. railway freight and railway express. This traffic bears the highest rates and constitutes a relatively small volume of total railway tonnage. Under present conditions, i.e., present technology and governmental control of truck weights and lengths, rates equal to the highest type of railway rates are necessary for road transport to operate profitably in the long-haul market. In the period up to the middle 1950's, many of the high value-of-service rail rates which existed allowed road transport to compete effectively. According to Mr. J. MacDuff, General Manager of Gill Interprovincial Lines, Ltd., the railways have made it difficult for road transport to compete in the long haul for anything but the L.C.L. and express rail traffic by instituting competitive rates in more recent years. Further, the railways have striven to the greatest degree possible to consolidate L.C.L. freight and express traffic into carloads. By the use of agreed charges, incentive rates for volume, piggyback, containers and automated freight sheds, the railways have endeavoured to eliminate small shipments.

The portion of the demand curve from point C to point B, is relatively elastic. Cross-elasticity of demand is high for the tonnage involved because of the possibility of substitution. However, the portion of the curve from point B to point A, represents traffic which is of a monopoly nature. Thus, the slope of the demand curve in the

AB portion would become more steeply inclined than the BC portion. Cross-elasticity would decrease.

Of necessity, price levels for the long-haul market would be higher than price levels in the short- and intermediate-haul markets.

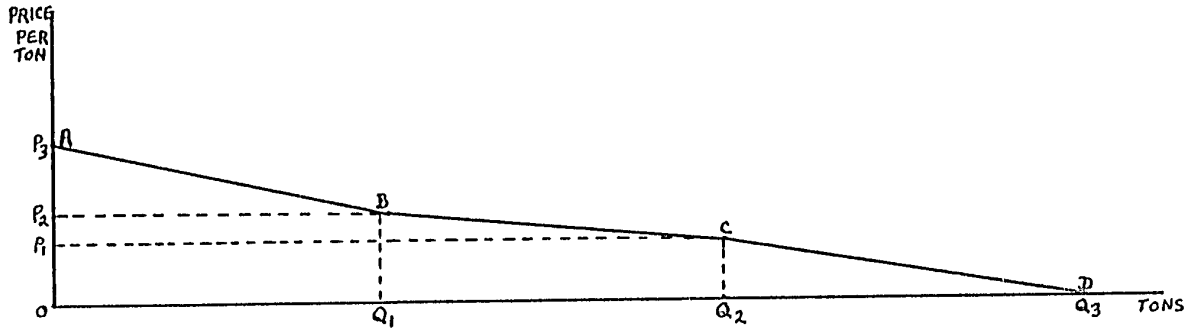
While particular kinks exist in the curves, should either road or rail transport exceed the critical threshhold in any of the curves shown, or to be shown shortly, then the curve of the competing mode would shift because of the additional traffic gained.

Summary. In the short-haul market, road transport evidenced considerable ability to compete, but, with lengthening distances, this ability was greatly reduced. In the long-haul market road transport can compete only above a certain price level. In the three curves discussed, there is a portion in each where there is an interdependence of road and rail transport and cross-elasticity of demand is greater than at other portions of the curves.

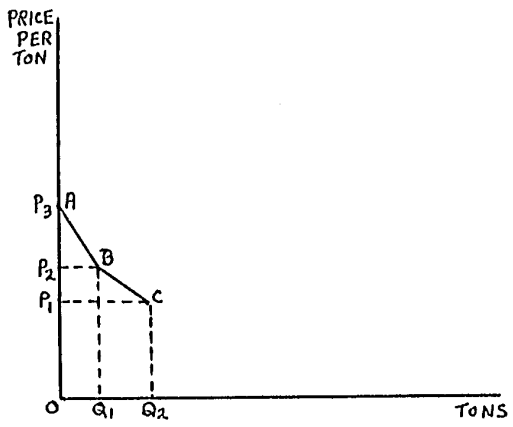
Low-Valued Commodities. The inability of low-valued commodities to bear transportation costs is evidenced in the tonnage of these commodities moved by road and the short distances involved. The three demand curves shown below in Figure IX express the situation.

FIGURE IX

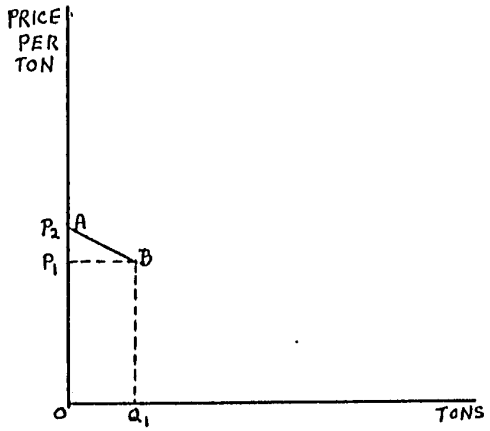
Road Transport Demand Curves, Low-Valued Commodities, Short-, Intermediate-, and Long-Haul Markets, Canada



SHORT-HAUL MARKET



INTERMEDIATE-HAUL MARKET



LONG-HAUL MARKET

TONNAGE SCALE - ONE AND ONE-HALF TIMES HIGH-VALUED CURVES

It will be observed that there is one barely distinguishable combined kinked-reverse kink curve, a reverse kink curve, and a small, relatively elastic, downward-sloping curve.

As stated, the tonnage proportions in the short-haul market were 143.3 million tons for road transport and 18.0 million tons for rail.

In the intermediate haul, only 3.0 million tons were transported by road, while rail carried 25.0 million tons. In the long-haul market, virtually nothing was transported by road, while rail carried 35.0 million tons.

The description of the road transport short-haul demand curve for low-valued commodities is much like that of the short-haul curve for high-valued commodities. However, there are differences. The demand curve for low-valued commodities is not nearly so steep, displaying greater elasticity at all points than does the curve for the higher-valued group. There are three reasons. First, rates are lower for similar situations when compared with the high-valued commodity market. Second, the tonnage proportion is much greater, i.e., 143.3 million tons compared with 95.5 million tons. Third, to emphasize the elasticity of demand, tonnage proportions have been shown at one and one-half times those shown for high-valued goods.

A slight kink is shown at point C of the short-haul curve, indicating the critical threshhold. This evidences the level at which rail transport may be substituted for road transport. Because of the competitive situation between road and rail transport in the BC portion of the curve, any slight increase in price by road transport would result in a relatively large decrease in quantity demanded.

The slope of the AB portion of the curve would increase slightly over the BC portion, because of some monopoly traffic being available to road transport in the limited time period at least.

The lack of ability of road transport to be able to provide economic service for low-valued commodities in the intermediate-haul

market, is evidenced by the reverse kink demand curve shown. Road transport cannot compete below price level P_1, which is similar to the long-haul road transport market for high-valued commodities.

Between point C and point B, the traffic could be competed for by both road and rail transport and, thus, this portion of the curve would be relatively elastic. From point B to point A, road traffic would be of a monopoly nature, in the limited time period at least. Thus, the slope of this portion of the curve would be steeper than the BC portion.

As road transport virtually does not operate in our postulated long-haul market, a limited, relatively elastic, downward-sloping demand curve is shown. Theoretically, at some rail price level road transport could compete for traffic, more probably with increased use of road bulk-hauling equipment. The types of products which produce higher revenues per ton mile, and which may be involved, would be nickle, copper and aluminum concentrates, asphalt, some types of rough stone, milled asbestos and bulk petroleum.

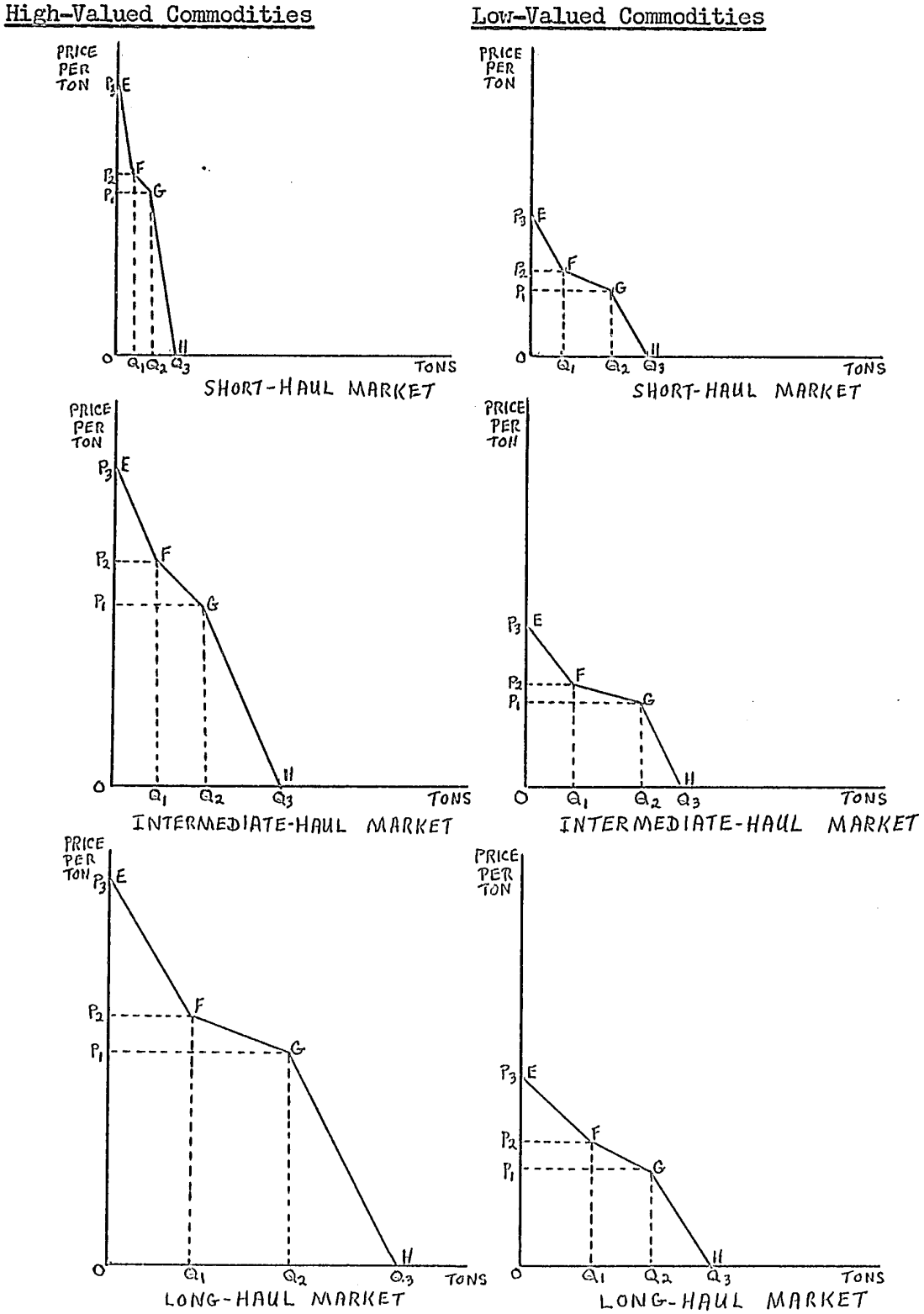
Summary. The most significant features of road transport in the low-valued commodity market are the short distance it is used, and the large tonnage it carries in the short-haul market. While road transport shows a decided advantage in the very short haul, such advantage is dissipated very quickly.

RAIL DEMAND CURVES

Figure X below includes rail transport curves for our six postulated markets.

FIGURE X

Rail Transport Market Curves, High- and Low-Valued Commodities, Short-, Intermediate-, and Long-Haul Markets, Canada



TONNAGE SCALE - LOW-VALUED CURVES ONE AND ONE-HALF TIMES THAT OF HIGH-VALUED CURVES

Explanation of Rail Curves

As road transport curves are determined by the ability of road transport to compete and by the pricing policy of rail transport, so the pricing policy of road transport and rail ability to compete determine rail transport curves.

Road transport evidenced its greatest strength in the shorter haul. Thus, proportionately, rail transport carries a very small tonnage in the short-haul market (high-valued goods, 2.1 million tons of 97.6 million tons; low-valued commodites, 18.0 million tons of 161.6 million tons). This rail traffic is primarily of a monopoly nature, on which cross-elasticity of demand is low.

Rail traffic in the short haul has been retained for a number of reasons. First, a shipper's facilities may still be oriented to rail shipment because of the type of product. Second, the railways have signed a large number of agreed charges. They all cover a minimum of fifty per cent of the traffic and, frequently, they cover ninety, or many times 100 per cent of the shipper's total volume. Thus, short-, intermediate-, and long-haul traffic would be included. Third, the railways' economic advantage would begin to appear beyond 100 miles. Fourth, beyond 100 miles the effect of piggyback and containers (subjects dealt with in Chapter VII) would begin to appear, e.g., between Montreal and Ottawa. Fifth, recently there was an announcement that the Canadian Pacific Railway and 100 chain and department stores were cooperating on a $2.0 million automated freight shed for the purpose of combining

small shipments of goods into carload lots for transportation to rail outlets throughout the nation.[17] While most of this will be delivered by truck in the short haul, some no doubt will go by rail. Sixth, some commodities are too bulky or too large to be handled by road, i.e., lengths of pipe greater than sixty feet.

If for any of the foregoing reasons, or for any other reason, rail traffic in the short-haul market has not fallen to the powerful service advantage of road transport, then such demand for rail transport must be noticeably monopolistic.

It will be noted in Figure X that with the lengthening of distance, rail transport tonnage increases for both high- and low-valued commodities. The greatest tonnage is in the long-haul markets. All six suggested rail transport curves are a combination of a kinked and a reverse kink curve. The description for each is the same but the basic differences are the tonnage proportions, the difference in price levels, and the price levels at which the kinks occur. These differences result in different elasticities and cross-elasticities in the curves. The slopes of the curves are different.

In all six instances, the portion of the curve from point H to point G, i.e., up to price level P_1, indicates the price range in which rail transport can maintain traffic because of either its operational or economic advantage. The critical threshhold appears at the general price level of P_1. Should rail prices exceed this level, road transport may compete for the traffic and the road curve would shift appropriately. Thus, the portion of each curve from point G to point F

is more elastic and less steeply inclined than the GH portion. The slopes of the FG portions vary. From point F to point E, the curves would involve traffic of a monopoly nature for the limited time period at least. The slope of the EF portion of each curve would be more steeply inclined than its FG portion.

Railway Competitive Rates

By the use of competitive rates the railways have been able to maintain their competitive position in the intermediate- and long-haul markets, especially for high-valued commodities. They have used non-competitive commodity rates for low-valued commodities. With the use of either of these types of rates, they have operated on the less elastic portion of their kinked demand curve, i.e., below the critical threshhold. The railways maintain they have a monopoly on traffic in many instances because their rates are so low. This takes the traffic out of a competitive area. They state if rates were higher, other modes of transport would compete.

A few instances will be mentioned to illustrate briefly the railways' use of their economic advantage in the longer haul for price-setting within the less elastic portion of their demand curve, i.e., below point G in the curves shown in Figure X.

The railways lost a good deal of automobile traffic prior to the establishment of agreed charge contracts with the automobile manufacturers in the latter part of the 1950's. The high rail rates existing on this traffic prior to agreed charges, allowed automobile

carriers to transport a large volume of automobiles to all parts of Canada. By the use of agreed charges, the railways recaptured a good part of this traffic. Many of the automobile carriers could no longer compete, especially for the long-haul movements to Western Canada. Also, in more recent years, specialized cars have aided the railways to reduce costs.

Agreed charges, to be as effective as they have been, would fall below the critical threshhold of the rail demand curve. If, however, these rates were again set high enough so that demand would be in the more elastic portion of the rail demand curve, or exceed the price level at point G, then automobile carriers could re-enter the market and capture traffic for longer hauls.

Appendix XVI shows some other instances of price-setting within the less elastic portion of the rail curve. MacMillan Bloedel, Ltd., is one of the largest manufacturers of wood products in British Columbia. This firm transports ninety per cent of its plywood, shingles, particle board and similar products to other provinces by rail, under an agreed charge contract. Further, 100 per cent of its newsprint is shipped by rail to other provinces. Most local shipments, i.e., up to 200 to 300 miles (within British Columbia), are transported by truck. On rare occasions a truck will transport a load as far as Winnipeg.

The following rates, from Vancouver to the points shown, were obtained from MacMillan Bloedel, Ltd. These rates indicate that the railways operate below the critical threshhold of their curve. Otherwise road transport would reduce its rates to compete for this traffic.[18]

	Rail	Road
	Cents Per Hundred Pounds	
Calgary	$0.72	$0.80
Edmonton	0.85	0.90
Regina	1.15	1.20
Winnipeg	1.49	1.53
Toronto	1.64	1.74

If the railways were to increase their rates by the differential existing, demand for rail service would become more elastic and cross-elasticity would increase.

B.C. Sugar Refining Company, Ltd., virtually supplies the sugar and sugar products for the four Western Provinces. White sugar is manufactured by this Company or its subsidiaries in Manitoba, Alberta and British Columbia. Yellow and fancy sugars are shipped from the Pacific Coast to the Prairie Provinces. These shipments all travel by rail under agreed charges. Undoubtedly, road transport would enter this market if the railways were not operating on the less elastic portion of their curve, i.e., below the kink at point G. The Road Transport Tariff Advisors in British Columbia and Alberta both state that careful watch is exercised in respect of rail rates on all products which trucks can move profitably. If road transport can enter a market, it will very quickly do so.

One further instance relates to department and other stores in Vancouver. The T. Eaton Co., Ltd., the Hudson's Bay Company, Woodward's, Ltd., and eleven other similar companies have a pool car

arrangement whereby all of their shipments from Eastern Canada are moved under one agreed charge. (The rates were not made available to the writer). The Traffic Manager, who discussed the matter, stated that truckers do not bid for the traffic because of the present low level of rail rates. Nevertheless, if rates were increased sufficiently, road transport would endeavour to enter the market. Presumably then, here again, the railways are pricing on the less elastic portion of their demand curve.

The above-mentioned fourteen companies distribute merchandise by road from Vancouver to British Columbia points, to Alaska, to the Yukon, and to the Northwest Territories.

Summary

In summary we find that rail transport operates to some degree in our six postulated markets; the proportion of tonnage handled by rail transport increases with distance, evidencing the rail economic advantage; at some general price level road transport can enter the market and capture rail traffic, resulting in a kink in the rail curve; that the railways operate below the kinks in their various demand curves with the use of competitive rates and non-competitive commodity rates; and that, in the short run at least, the railways possibly have a limited amount of traffic, which is more of a monopoly nature, and which can bear relatively higher rates.

CONCLUSIONS

Elasticity for the total transportation demand curves is determined by the demand for the various products being transported. Within the confines of the total demand curves, the elasticity of the modal curves is determined by the pricing policy of the competing mode of transport.

Road and rail transport both have their own particular advantages. As mentioned earlier, various market arrangements exist.[19] While the service advantage of road transport and the economic advantage of rail transport are in evidence in both high- and low-valued commodity markets, greater competition is evidenced in the former. Thus, cross-elasticity of demand is greater for high-valued products than for those of low value. High-valued products can bear greater transportation costs, making it more realistic for road transport to compete. For the transportation of low-valued commodities, there are almost two separate areas of operation - road transport in the short haul and rail transport in the intermediate- and long-haul markets.

Road transport faces a kinked-reverse kink curve in three markets; in two markets it can only enter at a certain price level, i.e., in the long-haul market for high-valued goods and the intermediate-haul market for low-valued commodities. In the sixth market, i.e., the long-haul, low-valued commodity market, it does not operate.

Rail transport faces a kinked-reverse kink curve in all six markets, but its tonnage in the short haul is very limited. As distance

increases, so does rail tonnage for both high- and low-valued commodities.

In all six markets, as the price level increases in each market, the advantages of the two modes become more equalized and, at a certain point, substitution is possible. Cross-elasticity of demand increases and demand becomes more elastic in nature. For various reasons there exists, in the limited time period at least, some monopoly attachment for each individual mode of transport.

This demand analysis indicates that each mode has particular advantages and each is necessary to the community. Technological changes and regulation amendments, some of which are mentioned later, could aid road transport to pierce further into the longer-distance market. Thus, with changing conditions, demand could change in the next decade.

The objective of this chapter is to indicate the present sphere of operation of road and rail transport and to show the relationship between the two modes.

FOOTNOTES FOR CHAPTER III

1 Donald S. Watson, Price Theory and Its Uses (Boston: Houghton Mifflin Company), 1963, p. 30.

2 Ibid.

3 Ibid., p. 99.

4 George W. Wilson, Op. cit., p. 90.

5 Grains are included in road shipments of cereal preparations as it was not possible to separate the two. However, there was not a great deal of tonnage in this category and, thus, the bias is not significant. Much of the grain moved by road is moved by farm truck, which traffic is not included. Grain and flour transported by rail under statutory rates are included in the low-valued commodity category, because a relatively large amount of tonnage is involved.

6 The Board of Transport Commissioners for Canada, Waybill Analysis, Op. cit., 1965, Table 3.

Revenue per ton mile on export grain and grain products was 0.50 cents. However, being statutory rates they do not reflect a market situation.

7 MacPherson Royal Commission report, Op. cit., Volume II, pp. 8-19.

8 The Financial Post, Op. cit., May 27, 1967, p. 29.

9 D.B.S., Motor Transport Traffic, National Estimates, Op. cit., 1963, p. 17.

10 Ibid.

11 Exceptions exist, where, for example, the railways may charge a lower rate from Ontario to British Columbia to compete with Panama Canal water rates, while the rate from Ontario to Alberta may be higher than the British Columbia rate.

12 D.B.S., Motor Transport Traffic, By Commodities, Op. cit., Third Quarter, 1963, p. 6.

13 The Board of Transport Commissioners for Canada, Waybill Analysis, Op. cit., 1964, pp. 16 and 34.

14 There are two points for mention. First, precedence for the use of a kinked-type curve is found in the MacPherson Royal Commission report, Volume II, pp. 117-121. Second, to facilitate explanation, description of the curves commences from lower portions, as was done by the Royal Commission.

15 Richard H. Leftwich, The Price System and Resource Allocation (Toronto: Holt, Rinehart and Winston), Third Edition, 1965, p. 226.

16 Discussion with Mr. H.H. Williamson, Tariff Advisor, North Burnaby, B.C.; and letter, to the writer, from Mr. T. Chris. Mikkelsen, Western Tariff Bureau, Calgary, dated January 18, 1968.

17 "Automated Freight Terminal," Supervisors' News Bulletin (Toronto: Industrial Supervisory Institute), April 27, 1967.

18 These rates are based on 40,000 pounds for rail and 44,000 pounds for road. For heavier rail shipments, volume discounts are allowed. Also, this Company never ships to Toronto by road.

19 Throughout the text, references are made to industry monopoly positions by road or rail transport, indicating lack of either road or rail competition. Should three truck lines be entering a non-rail area, then, from the trucking firm's viewpoint, an oligopoly exists.

CHAPTER IV

THE NATIONAL TRANSPORTATION ACT

INTRODUCTION

The National Transportation Act received Royal Assent on February 9, 1967.[1] It stemmed from the recommendations of the MacPherson Royal Commission, which was originally conceived as a body to study railway freight rate problems. The scope of the Commission later extended into the various overall problems existing in railway transportation in Canada. To achieve a workable solution, the Commission felt that competition between the various modes of transport should exist to the greatest extent possible. A corollary to this principle was that all modes of transport should be treated in the same manner. It was felt that by this approach the maximum potential would be achieved from the nation's transportation resources.

Outlined in Appendix XVIII are the circumstances surrounding the appointment of the Royal Commission, and its major principles and recommendations. Also commented upon are Bill C-120, subsequently introduced by the Federal Government but not passed, and Bill C-231, which, with amendments to its original contents, became the National Transportation Act.

RAILWAY BURDENS

The MacPherson Commission found that the railways were weakened by burdens inherited from a monopolistic era - burdens in part due to public policy and in part due to policies pursued by the railways. To attempt to relieve the railways of these burdens and to place them in a more competitive position will have an effect on the trucking industry, in some respects adversely, while in other respects favourably.

Burdens of Public Policy

As outlined in Appendix XVIII, the MacPherson Commission found that using 1958 data, the major burdens emanating from public policy were annual losses of $13.0 million from the operation of about 8,600 miles of light-density lines; $70.0 million from the operation of uneconomic passenger service; about $3.0 million from the provision of free statutory transportation; and a $6.0 million short-fall of revenue under variable costs for export grain and grain products. The Commission suggested that a reasonable contribution towards constant cost would be $16.3 million. These five items would total approximately $108.3 million, which was equivalent to about 9.3 per cent of the total railway operating revenue of $1,163,735,411 for 1958.[2]

Origin of the Burdens

From where did these four loss burdens arise? First, light-density lines resulted primarily from the extended use of the motor vehicle. Branch lines were built in earlier days for the purpose of feeding the main trunk lines. While the light-density lines were cross-subsidized by the heavier-density lines, it was anticipated that with the passage of time these branch lines would become self-sustaining. With the intervention of the motor vehicle, many branch lines never reached a profitable stage, while for others their profitable operation was eroded away. On the Prairies, for example, where well over half of the branch lines are located,[3] many such lines were left to carry only grain. Second, competition from the bus, the aeroplane and the automobile rendered railway passenger service unprofitable. In both branch line operations and the provision of passenger service, large amounts of railway capital have been invested. Third, turning to statutory grain rates, a rigid control by Parliament has and still maintains the rate level at three cents a hundred pounds below that existing in 1897, which was established by the Crow's Nest Pass Agreement.[4] Fourth, statutory free transportation burdens resulted from the decision of Parliament to place on the railways the cost of transporting government and other specified persons at no charge.

In earlier days these losses would have been subsidized by freight traffic. Under the value-of-service pricing system which

existed (described in Chapter II), the railways were able to remain viable. With the inroads of motor vehicles two effects were registered. First, traffic was siphoned away from the railways. This resulted in branch lines and passenger services becoming an increased financial burden on freight traffic. Second, the freight which was subsidizing any unprofitable service, and could do so, was that which was being siphoned off or being carried at reduced rates. Thus an expanding group of unprofitable services was being borne by a segment of traffic which was becoming less and less capable of sustaining anything more than its own transportation costs. The result has been that these unprofitable service burdens have in recent years been lifted by Federal Government subsidies which were referred to earlier.

EFFECT OF CHANGE ON ROAD TRANSPORT

The National Transportation Act includes provisions respecting branch line abandonments and passenger services. How will these legislative provisions affect road transportation?

Branch Line Abandonment

Branch Line Trackage. As will be noted in Appendix XVIII, sheet two, in 1958 there were an estimated 8,600 miles of branch line, or about twenty per cent of track,[5] with a density of less than 100,000 ton miles per mile of track which could be eligible for aban-

donment. Thus if all of the eligible branch lines were abandoned over the suggested period of fifteen years, additional net ton miles which could accrue to road transport could amount to something less than 860 million ton miles. This would constitute less than 4.4 per cent of the total 19.4 billion net ton miles performed by road transport in 1965.

Appendix XX, sheet two, indicates that by August 1966, line abandonment applications before the Board of Transport Commissioners covered 4,200 miles of track, just less than fifty per cent of the amount suggested in the MacPherson Commission report. Also included in Appendix XX is an outline of the Federal Government's plan to protect from abandonment about 17,000 miles of track in the three Prairie Provinces. It will also be noted that in those three Provinces there are almost 1,839 miles of unprotected lines. As its guide, the Government decided that lines generating 50,000 or more bushels of grain per mile of track were to be placed under protection. Further, there is no regular passenger service on any of the 1,839 miles of unprotected branch lines.

While the Government does not intend to allow large-scale abandonments, so that long-term planning can be effected and, undoubtedly, because of political pressures, one must also consider that since the 1958 study by the MacPherson Commission, the Prairie Provinces have experienced greater prosperity. This is one substantial reason why approximately only 1,800 miles of branch lines would need to be promptly eliminated. Therefore, there will be a very

limited amount of net ton miles which will accrue to trucking with this limit placed on abandonment. A map of the protected and unprotected lines was received from the Federal Department of Transport. A study of it reveals that there are protected lines in close proximity to any which may be abandoned. Therefore, it would appear that there will be no significant change in rail net ton mileage but some additional ancillary hauls by farm truck will be required.

Ancillary Hauls. Ancillary hauls will primarily consist of trucking grain to the country elevators. The precise number of additional net ton miles involved is difficult to estimate. One Manitoba study indicated that on applications covering abandonment of just over 1,000 miles of track, 21.7 million bushels of grain would be affected. This could approximate 4.5 million additional net ton miles for road transport.[6] Extrapolating for 1,800 track miles (the possible amount which may be immediately abandoned), it may be expected that approximately 8.1 million net ton miles, or an amount of less than two per cent of farm trucking in 1963, could result for farm trucks. According to the Manitoba study the cost of the road haul to the elevator would increase by about fifty per cent. This suggested increase in cost may be higher than that which might be experienced because it is felt by some that there is a good deal of excess capacity in farm trucking. The total haul cost to the Lakehead could increase by thirty per cent.[7]

In addition to the handling of grain there would be an

increase in trucking for any industries which may be located on abandoned branch lines.

Joint Use of Tracks. In the new legislation there is provision for the utilization of one rail line where two are now in close proximity, i.e., a rationalization of lines between two systems. In Saskatchewan, where there is a major branch line problem - almost 2,500 of the 4,200 miles proposed for abandonment - there are various instances where cooperation by the use of joint tracks could be effected. Where such cooperation may result, additional trucking could be required for longer hauls to the railhead but possibly a more efficient overall operation could result from such an arrangement. While this is another part of the branch line abandonment approach, it is a variation in that there would be a "merging" of the services of two railways in affected areas. It may possibly allow further abandonments without adding an undue hardship on those shippers concerned.

Summary. In summary, from the limited information available, it would seem that the Government's breakeven guide for unprotected lines is substantially lower than that of the MacPherson Commission guide. Political pressures seem to have spurred the Government into the low level of tonnage used as a guideline for abandonment purposes. Yet with prospects for a more prosperous era on the Prairies because of larger grain shipments, care must be taken not to abandon lines which may become profitable and may prove to be

necessary. On the other hand, rail management has been fairly limited in the new policies on abandonment and it is to be hoped that subsidies, which are provided for, and referred to below, will not be paid for unprofitable lines strictly for political ends. While the trackage for abandonment mentioned by the MacPherson Commission may be greater than is now necessary, at least temporarily, rail plant should be rationalized unless sound and substantial reason can be found for continuing unprofitable lines. Care must be taken to ensure that any branch line which is continued is a necessity to the area it is serving. In the immediate years ahead, with present arrangements, there would seem to be only very limited traffic which road transport will gain by abandonments.

Subsidy Effect

How will railway subsidy action resulting from the new legislation affect road transport?

Railway Aid. As shown in Appendix XVIII, sheet ten, the new legislation provides for a blanket subsidy ranging from $110.0 million in 1967 to $12.0 million in 1974. The $110.0 million was set to be approximately equal to the total subsidy paid to the railways in the year before the enactment of the National Transportation Act. This general subsidy arrangement is a phazing-out process of the freight rate reduction subsidies which existed formerly. The Act states, however, that in any one year the railways would be paid either

the overall subsidy or the sum of specific subsidies arising from the operation of Sections 314E, 314G (branch lines), 314J (passenger service), and 329 (export grain and flour) of the Act.

It would seem that by now any effect which the subsidy program will have in aiding the railways to compete will have been largely accomplished. The railways' ability to extend competitive rates to the degree they have would suggest this to be the case. As shown in Appendix XIX, a sum of $110.4 million was paid to the railways in the 1965-1966 fiscal year. This amount was equivalent to 7.3 per cent of the railways' operating revenues in 1965, which totalled $1,510.1 million.[8]

Many commodities would have been vulnerable to road transport competition. However, this subsidy action has enabled the railways to charge lower prices than would otherwise have been the case with unprofitable services existing and frozen freight rates for one-third of the traffic. Where competitive rates apply, lower prices were necessitated by competition. On the other hand, Government compulsion has required that class and commodity rates remain "frozen" and statutory grain rates be continued.

Subsidy action will not enable further rate reductions, but any subsidies paid to the railways will aid them, for the immediate years ahead, to maintain the competitive position achieved.

Increase in Railway Rates. Within the past year the railways have announced four freight rate increases. The first was

an approximate ten per cent increase in competitive commodity rates, which was effective in October, 1966. On January 1, 1967 increases of ten per cent were made effective for most agreed charges. In May of 1967 increases were put into effect for class and non-competitive commodity rates (frozen since 1958), and a further increase was recently announced for competitive commodity rates, to be effective in the Fall of 1967. This most recent increase ranges from three to six per cent. Shortly after the rail increases were announced in the Fall of 1966, the trucking industry in Central Canada took similar action to raise its rates. Since that time the industry has effected increases in other parts of Canada.[9]

The exposure to competition of any of this railway traffic would appear to be a possibility but road transport itself is also faced with the necessity for additional revenue because of rising costs. Nevertheless, if subsidy action did not exist, undoubtedly, these rail rate advances would have to be larger.

While rail non-competitive commodity rates cover specific commodities which are generally bulk-loaded and not highly vulnerable to road transport competition, with the increased use of bulk-hauling equipment by trucking companies, a subject dealt with in Chapter VIII, and increased and improved highway mileage, costs for road transport of bulk commodities should decrease. Thus with reducing railway subsidies over a period of time and possible reduced costs for hauling bulk traffic, non-competitive commodity traffic could become competitive in some instances. However, some of these commodities will

likely always be rail traffic, especially over longer distances, as was shown in Chapter III.

With a reduction in subsidies and an altered technological arrangement, changes will occur in the elasticity of demand for road and rail transport service. This could become more evident with the passage of time.

"Head-End" Passenger Equipment

Bill C-120 and the original Bill C-231 provided that "head-end" passenger equipment, or those cars in passenger trains which carry mail and express, be included in the subsidy for uneconomic passenger service. This was strongly objected to by the Canadian Trucking Associations, Inc., and mail and express traffic cars were eliminated from subsidy payment in the National Transportation Act. It was contended by the Associations that mail and express cars actually carry freight and that, if they were subsidized under passenger subsidies, it would be unfair competition for the trucking industry.[10]

If "head-end" traffic is adding to railway revenues anything more than its long-run marginal costs, then such excess revenues will aid in reducing losses sustained in the transportation of passengers. On the other hand, if "head-end" traffic does not cover its long-run marginal cost, such losses will be borne by the railways and, undoubtedly, the railways will take steps to eliminate such unprofitable service. This may be accomplished either by rate increases, forcing

the traffic to road transport over a period of time, or by immediate discontinuance of the service, also forcing the traffic to move by road. There is provision in the legislation to allow Government to compel only passenger services to be continued and to subsidize such losses. Thus any sharing of constant cost which formerly took place between "head-end" traffic and passenger traffic, would cease when the railway decided it was not going to continue uneconomic "head-end" traffic. The total cost of operation would be placed on the passenger service, with eighty per cent of the losses sustained to be borne by the Government. There would then be the possibility of a greater net cost than if "head-end" traffic were included. The determining factor would be whether the loss on "head-end" traffic exceeded or fell short of the amount it contributed to the constant cost.

This action to eliminate "head-end" traffic from the subsidy payment will, however, have one benefit. If the public desires to have any passenger service continued, such passenger service will bear its full costs and eighty per cent of the losses sustained will be placed with the public.

Mail and Express Traffic for Road Transport

As unprofitable passenger trains are eliminated, mail and express carried by such trains will be abandoned. Such traffic will then be available for some type of road transport. What proportion will be retained by the railways because of their merchandise services and railway trucking operations, is difficult to determine because of

lack of data. It would seem that railway and independent trucking will compete vigorously for this traffic.

SPECIFIC SUBSIDY CHANGE OR ELIMINATION

The MacPherson Commission recommended action on four existing subsidies in order to achieve a more competitive road-rail market. The four referred to are shown in Appendix XIX. They are: the Maritime Freight Rates Act ($15.8 million in the 1965-1966 fiscal year); the East-West "Bridge" Subsidy ($7.0 million annually); the Freight Rates Reduction Act (up to $20.0 million annually but generally less because it applied to class and non-competitive commodity rates, which have been decreasing in number with the increase in competitive rates); and the Feed Freight Assistance Act ($21.0 million paid to Eastern and British Columbia millers in the 1965-1966 fiscal year).

The Commission recommended that intra-Maritime freight be eliminated from the Maritime Freight Rates Act and that subsidies on outgoing freight be made available to road transport traffic; that the East-West "Bridge" Subsidy and the Freight Rates Reduction Act be eliminated; and that Feed Freight Assistance be applied to feed transported by road.

Analysis of this suggested subsidy action implies that there will be some effect on the future of trucking but how far the Government may go in implementing these recommendations has been only partially indicated. For example, the matter of the Maritime Freight

Rates Act was deferred and exclusions were included in Bills C-120 and C-231, as the Government has promised separate legislation which has not yet been made public. This action is pending the completion of a whole study of transportation in the Maritimes. Abolition of the East-West "Bridge" Subsidy was a provision of Bill C-120 and is included on a three-step annual abolition basis in the new Act. Prior to the National Transportation Act, assistance was extended to aid feed grain moved by truck in Eastern Canada, and the Freight Rates Reduction Act has been abolished.

Maritime Freight Rates Act

For-hire trucking could be aided in the Maritimes if the changes suggested by the Royal Commission were implemented. As was witnessed in Chapter I, for-hire trucking in the Maritimes is very limited proportionately when compared with other parts of Canada. It was stated previously that probably the important factor involved was the payment of subsidies under the Act. The subject, however, may be divided into two parts - intra-Maritime shipments and shipments leaving the Maritimes.

Intra-Maritime Shipments. The Royal Commission recommended that payment of subsidies on intra-Maritime shipments be eliminated, (excluding those in Newfoundland). The reason advanced was that the aid was originally intended for extension of the Maritime market into other parts of Canada and, thus, this aspect of the subsidy was not

achieving the original objective.

Intra-Maritime traffic accounts for approximately seventy-five per cent of all rail shipments originating in the Maritimes (see Appendix XVIII, sheet five). Under present conditions, as shown in Chapter I, there is a limited amount of for-hire trucking in the Maritimes but there is a larger amount of private intercity carriage. The railways, however, transport a good deal of the traffic in that area. It would seem that more could be handled by independent road transport, or railway-owned trucks, independent of the railways. If such is the case, the function of the service advantage of road transport is not fully exploited because of this artificial restriction placed by the reduction of the rail rate on traffic within the Maritime Provinces. The railways no doubt use their own trucking facilities but in this case probably competition is inhibited because much of the railway trucking relates to railway freight which receives the subsidy. It would entail cost for loading and unloading which could be eliminated by only truck operation.

Should the subsidy be removed, there would be an immediate increase in real cost to the shipper and road transport could wage a more competitive campaign. Probably road transport would increase its use in the short- and intermediate-haul markets. No doubt the indirect results to be gained could more than compensate for the subsidy losses sustained by the Maritimes if the subsidy were eliminated. The subsidy must place some artificial restraint on the transportation market and must inhibit growth. Road transport is important in enabling

a decentralization of industry coupled with the necessity for only one loading and one unloading of traffic. This allows establishments to locate at a distance from rail lines and in the most appropriate geographical locations.

The highly industrialized areas of North America boast large truck populations and, in all likelihood, any expansion of trucking in the Maritime area could be beneficial. The Federal Government has encouraged highway building in the area. Early in 1965 it announced a $60.0 million highway program for the Maritimes, in addition to aid for the Trans-Canada highway completion.[11] The Government feels that a good highway system is vital to the growth of the area. The railways themselves have recognized the value of road transport operations in the whole transportation complex and have been aggressive in this field. This subject is dealt with in Chapter VIII.

Any obstacle which would inhibit the full utilization of the most suitable mode of transport for any given task, should be eliminated. This would appear to be a necessary step in respect of the intra-Maritime subsidy.

Shipments Leaving the Maritimes. The Royal Commission recommended that the Maritime Freight Rates Act subsidy be retained on shipments leaving the Maritimes and that it be extended to all forms of transport. Rail shipments leaving the Maritimes constitute about twenty-five per cent of the total rail traffic (see Appendix XVIII,

sheet five). Here again, as in the intra-Maritime market, a more competitive situation between road and rail transport would result. However, the rail price to the buyer of rail transport service would not increase, as in the case of intra-Maritime freight. The road price to the buyer of road transport would be reduced by the amount of the subsidy.

Distances for outgoing traffic will generally be greater than distances for intra-Maritime traffic. Thus the inherent cost advantage of the railways will be more pronounced in this market. But because the trucks can travel to Quebec and Ontario markets during overnight or slightly longer times, the trucking operators would be able to present stiff competition.

Initially there would be an increase in the quantity of road service demanded and, in a given market, the rail demand curve would shift to the left. Competition would be more equalized. Where road transport could offer advantage, the shipper could avail himself of this type of service.

Summary. The proposals in respect of the Maritime Freight Rates Act would seem to have long-run merit although transportation costs to the shipper of intra-Maritime freight would increase in the short run. Competition between road and rail transport would be more equalized and competition would regulate transportation to a greater extent than it now does.

East-West "Bridge" Subsidy

The Royal Commission recommended that the "Bridge" Subsidy be eliminated. This action has been taken in the National Transportation Act. However, the possible effects on road transport would seem to be limited.

The 1965 waybill analysis shows a total of 23,952 carloads in the rail waybill sample. Of this total, only 670 cars, to which the subsidy would apply, passed over the "Bridge" territory.[12] Of the 670, there were only 103 cars, or 0.4 per cent of the total which moved under class rates, and 567, or about 2.4 per cent were transported under non-competitive commodity rates. On the present technological level of attainment, it would seem that less than one-half of one per cent of the total cars moving over the "Bridge" territory would be open to road transport competition.

Non-competitive commodity rates by definition involve traffic which is not of a competitive nature insofar as transportation is concerned. Furthermore, long distances are involved in the "Bridge" territory and road transport will probably have to make greater use of bulk-hauling equipment if inroads are to be made on railway traffic. For the moment, especially with the three annual steps of the elimination procedure for the "Bridge" Subsidy, it would seem there is a very limited possible gain for road transport.

As the waybill analysis is on a one per cent sample basis, on the above data approximately 10,300 cars could be vulnerable to

truck competition, a large part of which is long-haul traffic.

Two further points should be mentioned. First, the percentage reduction is not overly great, 3.5 per cent or 9.5 cents per hundred pounds.[13] Second, there is always the possibility of the railways instituting competitive rates for any traffic which becomes competitive.

In summary, it would seem that regardless of the total impact on the transportation patterns, it is a wise step to eliminate the subsidy so that as normal as possible competitive conditions will prevail.

Freight Rates Reduction Act

The subsidy payment under the Freight Rates Reduction Act was an instrument used to reimburse the railways because they could not increase class and non-competitive commodity rates after May, 1959. This specific subsidy has been eliminated but replaced by part of the general subsidy. Immediately then it would not appear that there will be any outstanding effect on road transport.

Feed Freight Assistance

The extension of freight assistance to consumers of feed which is transported by road in Eastern Canada has effected a more competitive market for the transportation of this commodity. The major portion of the subsidy is paid for feed transported in the Eastern Provinces ($17.7 million out of $21.0 million in the 1965-

1966 fiscal year - see Appendix XIX).

While the Federal Department of Agriculture cannot give exact data on expected road transport participation in the feed freight assistance payments, at the present time ninety-five per cent of the movement of grain from the Lakehead to Montreal and other ports is by ship. From the ports, about eighty-five per cent of the grain in Ontario, and fifty to sixty per cent in Quebec, is moved by road, where a large part of the assistance is paid (see Appendix XIX). The subsidy is now paid for all portions of the trip from the Lakehead to final destination, which should aid motor carriers because some reduction in cost to the consumer should take place. Possibly some additional feed traffic will be gained by trucks.

The second recommendation advanced by the Royal Commission on feed freight assistance was that the whole plan should be reviewed to ascertain if the greatest value is being obtained from the existing arrangement. This would appear to be a sound recommendation. The present arrangement made for payments on feed freight may be achieving the most benefit from a national point of view. Also present payments may be a necessity to maintain the livestock and poultry industries. On the other hand, with changed economic conditions it may well be that the assistance should be discontinued or redistributed in such a way that certain areas or individual producers will be aided rather than having a blanket feed subsidy as at present. As the assistance has been in effect for over twenty-six years, a careful review of the policies, objectives and procedures should be made.

Summary

To date only limited benefits will accrue to road transport by the subsidy action dealt with in this section and, conversely, the railways will lose some limited advantages. Some benefit will be received by road transport from the extension of feed freight assistance to that mode of transport and by the elimination of the "Bridge" Subsidy. No immediate benefit would appear imminent from the abolition of the Freight Rates Reduction Act because of the payment of the general rail subsidy, but, if and when action is taken in respect of the Maritime Freight Rates Act, the proposal advanced could considerably aid trucking in the Maritimes. Competition should be more in evidence. There is, however, no guarantee that the suggested action will be implemented.

While the competitive market may be harsh on those concerned, when in operation it, nevertheless, results in checks and controls which are difficult to replace by regulation. It allows each mode of transport to operate where it can most advantageously utilize its economic and service advantages. This is what is desired for the nation. At this stage, minimum regulation would, however, seem to be a necessary factor in transportation to ensure that rates are compensatory. Otherwise competitive rates which do not cover long-run marginal costs can be ruinous and, in the long-run time period, can be detrimental to the shipper and to the nation as a whole. The MacPherson Commission recognized this and suggested min-

imum and, where required, maximum rate control (see Appendix XVIII, sheet four). Reference will now be made to those recommendations.

RATE CONTROL

Minimum Rate Control

Variable Cost. To suggest that minimum rate control be instituted to ensure that minimum rates are compensatory, presupposes that a suitable base may be arrived at which will constitute a rate which in the long run will properly compensate the operation so that it can maintain a healthy financial position. One of the major problems is the question of the variable cost of a particular shipment. The MacPherson Commission report stated that economists in the United States have expressed variable cost in at least five different ways.[14] Apart from deciding what will constitute variable cost, even the mechanics of determining transportation costs for shipments, presents a significant task. This is primarily because of the question of joint costs. It is necessary to apportion the costs of the railway among its various services and among the cars in the various services. It is also necessary to apportion the costs of a car movement among the shipments it contains. This is not an easy task. Thus it is imperative, as suggested by the MacPherson Commission, that there be made available to the regulatory authority the most efficient costing section possible - a practical and important suggestion. In its brief to the Standing Committee which heard

interested parties on Bill C-231, the Canadian National Railways stated that only a small costing section was necessary, its purpose being to check railway calculations.[15] This would, however, not appear to be adequate because of the many problems to be investigated.

The National Transportation Act has made provision for a study and research section, to be under the jurisdiction of one of the two Vice-Presidents of the new Transport Commission.[16] The question of economic study and research has, therefore, been afforded a prominent position and, thus, it should be able to devote the necessary attention to transportation costing problems. The establishment of such a section would seem to be a valuable addition to the regulatory body in order to determine many important matters. Some of the problems to be dealt with would include the determination of a compensatory rate level, the amount Government should invest in transportation facilities, the most efficient mode of transport for performing a particular service, whether aid should be extended to a particular mode of transport, and many other similar economic problems.

Railway Cost Situation. The MacPherson Commission stated that the long-run marginal cost for all modes of transport would be the most suitable for minimum levels of rate-making. Cost could vary for different situations. In the short run, i.e., for a single shipment, a car might be added to a train. On the other hand, specific equipment may be attached to a particular recurring type of shipment.

In this case, the equipment could be considered a long-run cost for that shipment.

Notwithstanding the above, the Commission desired to create as competitive an environment as possible with the least delay. The railways, however, are able to adjust plant and equipment only very slowly. This is because the life of rail equipment, track and buildings is lengthy and it cannot in many instances be substituted for other purposes. The alternative for determining a compensatory cost was to recommend that out-of-pocket (direct or short-run variable) costs should be the minimum rate level.

To use out-of-pocket costs for pricing in the immediate years ahead would seem to be generally sound because of the large investment in rail facilities. However, as time passes adjustment to the long-run marginal cost as the minimum rate level should take place. Otherwise, the railways would find that in the long run revenues would be inadequate for replacement of facilities. Therefore, after a period of years if a railway rate were challenged as being too low, it would seem that the regulatory authority should use as its control guideline the long-run marginal cost rather than the short-run marginal or out-of-pocket cost. Failure to revert to the long-run marginal cost would mean in the long run the rate would not be compensatory.

Variable Cost Principles. Bill C-120 and the new legislation have given considerable latitude to the regulatory authority

in determining variable cost. Briefly, the two provisions are that all relevant cost factors should be considered by the railways for rate-making as prescribed by the regulatory authority. Also, that the cost of capital for Canadian Pacific Railway should be used for computing capital costs.[17] This approach to the subject of determining variable cost would appear to be reasonable because a very careful study must be made before the specifics can be determined.

Effect on Road Transport

Minimum Rates. The relaxation of rate-making controls will have some effect on road transport as the railways move closer to the position of the ordinary price-making business enterprise. To what degree the change will affect trucking is difficult to assess. Heretofore, the railways have had freedom in setting competitive rates, which, as shown in Chapter II, covered over half of all railway traffic.

As mentioned, the railways have increased competitive, non-competitive and class rates. The trucking industry has also taken similar action. With the increased labour and material costs both modes of transport will probably find that any possibility of reductions will be remote. With increased costs, the compensatory level of railway freight rates will have increased, and this level will become the level of freight rate making for competitive rates.

The areas where road transport will be competing most strenuously will likely be for traffic carried by the railways under

competitive and class rates, and should the Transport Commission find any of these competitive rates to be non-compensatory, it is here the trucking industry could probably make gains. In the past the trucking industry has suggested that some agreed charges are not compensatory[18] and, thus, it is expected that certain of these rates will be contested.

Undoubtedly, the railways have and will continue to make increases in competitive rates relating to demand which is least elastic, graduating the increases downward on products for which demand is more elastic. Presumably the railways will be careful to expose traffic to road competition only to the degree which is absolutely necessary. While the trucking industry has found it necessary to increase its rates in recent months, it is keeping a close surveillance on rail rate increases for possible capture of traffic.

Turning to class rates, the highest level of rate, it was shown earlier that the railways have maintained only a small amount of traffic on this basis and it would seem that demand for rail transportation for this traffic is fairly inelastic. Because of the small amount of traffic involved and the suggested inelasticity, possibly road transport will not make great inroads on this traffic.

Non-competitive commodity rate traffic would not appear to be open to competitive challenge but with the passage of time, possibly increased bulk-hauling of traffic by road transport will change the situation.

The new legislation has extended greater flexibility to the railways in one more respect. They are now allowed to utilize incentive rates based on multiple carload and trainload bases. This will enable the railways to encourage shippers to take advantage of quantity discounts. Probably it will be quite effective against the trucking industry. The Trucking Associations take the view that this was probably the only remaining restrictive area over the railways when competing with the trucking industry.[19]

The guideline for a compensatory rate will aid competition because economy of operation should prevail. Where road transport is able to effect an economy for the shipper, by its service advantage, then road transport will prevail. Conversely, where rail transport can effect a compensatory rate and still evidence economic advantage, then it will prevail.

Maximum Rates. Under maximum rate control, there would not seem to be any major effect on trucking from the application of a captive-shipper rate where only rail transportation is available. In fact it might reduce the future possibility of trucking operations entering a particular market because of the limitation on the railway rates. If the railway rates were allowed to be increased to the point where it would be profitable for truck operation, a competitive market may be established. If a kinked demand curve were facing the railways, they may increase their rate beyond the kink and expose the traffic to truck competition. By that point, however, it could be

that either road or rail rates would be too expensive for any significant amount of a commodity to move.

While a captive shipper must sign a contract for at least one year in order to receive the special maximum rate benefit, provision is made in the new legislation for the Transport Commission to order experimentation with other modes of transport during the year, to ascertain the costs involved. This is important to the trucking industry as it does not preclude the use of road transport during a contract period.

Hearings

One important change under the new Act is that trucking representatives may be heard by the Federal Government.[20] Heretofore, because trucking operators have been under provincial regulation, they were not able to protest to the federal regulatory authorities when it was felt that a railway rate - for example, an agreed charge - was non-compensatory. The new legislation allows all interested parties to protest should it be felt a railway rate is below the variable cost of carriage. Should such be proven after the Transport Commission has made its investigation, then the rate can be cancelled. This is a particularly important gain to the trucking industry.

Because of the railways' economic advantage and of their central importance in the economy, a compensatory railway rate structure is a necessary and important guideline. As stated earlier, this

guideline is being used for a minimum control provision. To properly effect such control it would seem necessary that all interested parties should be allowed to advance their comments on proposed rates. The enactment of this provision would seem to be an important step.

OTHER RECOMMENDATIONS OF THE MACPHERSON ROYAL COMMISSION

Some additional recommendations were made by the MacPherson Commission. One concerned greater uniformity in the provincial regulation of the safety and performance of truck operations. Safety is referred to in Chapter VI. Three other recommendations related to a national transportation advisory council, an improvement in transportation statistics and development assistance for Newfoundland. All of these could not but aid trucking. It appears, however, that the Transport Commission has been given the role suggested for the advisory council, i.e., that of research and advice. This seems to have its merits, although some may argue against a combining of the research and control functions, feeling that they should be separate entities. If handled objectively, however, the research function should be an aid to that of control.

Finally, two additional recommendations concerned railway acquisition of trucking operations, which is dealt with in Chapter VIII, and the application of uniform piggyback rates to railway subsidiaries and independent trucking operations. At present, railway piggyback rates charged railway-owned trucking companies and those charged independent trucking companies are the same. The trucking

industry has been concerned with the possibility of the railways discriminating on these rates. A provision in the legislation was sought by the Canadian Trucking Associations, Inc., and obtained.

Because of the central importance of the railways to the economy, it would seem it is fair to charge equal rates for piggyback, treating all customers for the exact same railway service in the same manner.

This action ensures that independent trucking operations will be able to compete on the surface at least. Possibly later financial adjustments may be made between the railways and railway-owned trucking operations and the benefits gained by the legislative action could be nullified. There is, however, a provision in the new legislation to allow the Transport Commission to require the railways to keep separate accounts for their various modes of transport.[21] Nevertheless, regardless of how it is viewed, it is a difficult problem to solve because the railways are the final recipients of profit or the bearers of losses of their subsidiaries. Thus even if they do charge large amounts for piggyback service, ultimately at some stage, and in some way, the railways and their subsidiaries share the same purse.

ADDITIONAL CHANGES AS A RESULT OF THE NATIONAL TRANSPORTATION ACT

Further changes which have resulted from the new legislation concern various aspects of control of extra-provincial trucking. Six of these features are commented upon in Chapter V, which relates to

the subject of control of extra-provincial trucking. A seventh matter concerns a change in the Federal Lord's Day Act. Prior to the new legislation, the railways were allowed to operate on Sundays but extra-provincial trucking was not. This has now been changed to allow this type of trucking to operate seven days a week,[22] a necessary feature if competition is to be equalized to the greatest extent possible. While this provision will give greater operating possibilities to road transport, implementation of the hours-of-work provision of the Canada Labour Code, to which reference will be made in Chapter VI, could negate such gains.

CONCLUSIONS

The Royal Commission's report set out a blueprint for transportation policy and action. Competition was relied upon to the greatest extent possible for control and regulation. The new legislation has incorporated most of the major recommendations advanced by the Royal Commission and has, thus, endorsed the proposal of relaxation of control, with as much reliance on competition as possible.

Although actual assessments are difficult to make, probably from an overall point of view, road transport has more to gain than to lose by the new transportation environment which is emerging. Of the changes which have been implemented or proposed, those which favour road transport operations to a greater or lesser degree, would be branch line abandonment, changes suggested in the Maritime Freight

Rates Act, Feed Freight Assistance, elimination of the "Bridge" Subsidy, possible mail and express business, highway aid, the possibility for making representation to Federal authorities, the possibility to operate seven days a week and the gradual elimination of the general subsidy.

There are three changes which could have some adverse effect on road transport. First, the lifting of public policy burdens borne by the railways, by continued subsidy action, and, second, relaxation of control over rate-making. As stated previously, the sting of these two recommendations to road transport has probably in large measure been dissipated by now (1967) because of railway freedom in competitive rate-making and subsidies paid in lieu of the Royal Commission recommendations. The third provision, which relates to multiple car and trainload rates will, however, give the railways some advantage.

Overall, the trucking industry has made some major gains but it will be faced with more intense competition. This will not be new to it because it is an industry which has grown and thrived in a competitive environment. Over the years, it has experienced only limited provincial control. The National Transportation Act has made provision for the Federal Government to take direct control of interprovincial and international trucking, which is dealt with in the chapter which follows.

FOOTNOTES FOR CHAPTER IV

1 The National Transportation Act. First Session, 27th Parliament, 14-15 Elizabeth II, 1966-67.

2 D.B.S., Canada Year Book, Op. cit., 1960, p. 812.

3 In the MacPherson Commission's study of gross ton miles on the Canadian National Railways, of the total 8,731 miles of branch lines, 5,275 miles, or 60.4 per cent were in the Western Provinces, 1,877 miles or 21.5 per cent were in the Central Provinces, and 1,579 miles, or 18.1 per cent were in the Atlantic Provinces (excluding Newfoundland).

4 This was an agreement signed in September 1897, between the Canadian Pacific Railway Company and the Federal Government, which provided for maintenance of export grain rate levels at three cents per hundred pounds below the 1897 level. Rates on settlers' effects were also reduced. In return, a subsidy was given to assist in building the Canadian Pacific's 330 mile line from Lethbridge, Alta., to Nelson, B.C. The maintenance of rates on settlers' effects was removed but it remained on export grain.

For an account of this subject, see the Report of the Royal Commission on Transportation (Ottawa: Queen's Printer, February 9, 1951), p. 220. (Generally referred to as the Turgeon Royal Commission).

5 D.B.S., Canada Year Book, Op. cit., 1965, p. 762.

6 Mr. Bruno Legace, Economic Consultant, Winnipeg, in a letter to the writer, dated August 24, 1966, stated that he undertook a study of grain handling in Manitoba. On branch lines which may be affected - 1,050.45 miles - he calculated that 21,671,000 bushels of wheat were delivered. This would approximate 450,000 tons. For purposes of our calculation, a figure of 48.07 pounds per bushel has been used. This figure of 48.07 was based on total deliveries of grain in the 1962-1963 crop year (see D.B.S., Canada Year Book, 1965, p. 867), and the weight per bushel of each kind of grain. Mr. D.H. Jones, Counsel, Northwest Line Elevators Association, Winnipeg, stated that where abandonments occur grain would have to be trucked an average of ten additional miles. Thus, it is estimated by the writer, that the possible increase in net ton miles on Manitoba grain would approximate 4.5 million.

For Mr. Jones' comments, see Minutes of Proceeding and Evidence No. 15, March 9, 1965, Standing Committee on Railways, Canals and Telegraph Lines (Ottawa: Queen's Printer), p. 844.

7 The Northwest Line Elevators Association estimates that it costs seventeen cents to transport a bushel of grain from an area around Regina to the Lakehead. This cost is composed of two parts. First, the average haul of grain by truck to the elevator is ten miles, which, with a full load, would cost one-half cent a bushel per mile or five cents a bushel for ten miles. Second, transportation by train from the elevator to the Lakehead, a distance of approximately 775 miles, costs twelve cents, resulting in a total cost of seventeen cents. Further, the Association estimated that for that grain affected by elevator relocation, the average haul by truck would increase to twenty miles if the abandonment program as envisaged prior to the Prairie Rail Network Protection Plan, were implemented. Thus, trucking costs would have doubled, increasing the total transportation cost from seventeen cents to twenty-two cents, or almost by one-third.

See Footnote number 6 - Mr. D.H. Jones' testimony.

8 D.B.S., Railway Transport (Ottawa: Queen's Printer), 1965, p. 13.

9 Letters from Mr. W.P. Coughlin, Chairman, Canadian Freight Association, Montreal, to the writer, dated July 7, and September 15, 1967; also letter from Mr. E.J. Roberts, Canadian Transport Tariff Bureau Association, Toronto, to the writer, dated July 19, 1967; and discussion of July 12, 1967, between Mr. H.H. Williamson, Tariff Consultant, North Burnaby, B.C., and the writer.

The class and non-competitive commodity rate increases do not apply to export grain and flour, coal, coke, piggyback and international rates, nor to Maritime traffic. Tariff No. 85, Issued March 31, 1967, and Supplement No. 1 thereto, Issued April 19, 1967 (Montreal: Canadian Freight Association).

10 Transport Review, Canadian Trucking Associations, Inc., Op. cit., January 6, 1967.

11 "$60,000,000 for New Highways in Addition to Trans-Canada," Maritime Truck Transport Review, Op. cit., February, 1965, p. 7.

12 The Board of Transport Commissioners for Canada, Waybill Analysis, Op. cit., September, 1966, p. 3.

The figure of 670 cars shown for those passing over the "Bridge" territory may be slightly low because it was not possible to ascertain the number of cars moving within the Eastern territory, which also moved within "Bridge" territory. It is not likely to be too large.

13 The Board of Transport Commissioners for Canada, Annual Report, Op. cit., 1965, p. 13.

14 1. Directly assignable cost only.
2. Directly assignable cost, plus apportionments of indirect railway operating expenses.
3. Directly assignable cost, plus apportionments of indirect railway operating expenses, rents and taxes.
4. Directly assignable cost, plus apportionments of indirect railway operating expenses, rents and taxes, and a return on equipment.
5. Directly assignable cost, plus apportionments of indirect railway operating expenses, rents and taxes, and a return on road and equipment.

May be found at MacPherson Commission Report, Op. cit., Volume III, p. 159.

15 Submission to the Standing Committee on Transport and Communications Concerning Bill C-231 (Montreal: Canadian National Railways, October, 1966), p. 13.

16 The National Transportation Act, Op. cit., pp. 4 and 7.

17 Ibid., p. 45.

18 See Footnote 21 of Chapter II.

19 Transport Review, Canadian Trucking Associations, Inc., Op. cit., February 1, 1967.

20 The National Transportation Act, Op. cit., pp. 12 and 45.

21 Ibid., p. 58.

22 Ibid., p. 75.

CHAPTER V

REGULATION OF EXTRA-PROVINCIAL TRUCKING

INTRODUCTION

Heretofore provincial governments have exercised direct control over the trucking industry. Yet the strongest competitors, probably at the moment the only competitors of real significance,[1] of trucking operations have been the railways which are regulated by the Federal Government. Therefore, Federal influence relating to trucking has been limited and has been mainly of an indirect nature, effected through action taken in regard to the railways.

As mentioned in Chapter IV, the National Transportation Act makes provision for the creation of the Canadian Transport Commission - the regulatory body. Under the Act the transportation jurisdictional area of the Commission includes rail, air, water, commodity pipelines, and road transport in extra-provincial service. Excluded are oil and gas pipelines, which come under the National Energy Board. While the Federal Government has not yet assumed direct control of road transport, Part III of the Act makes provision for it to do so. This would involve about 1,000 trucking companies in Canada.[2] The explanation of clauses in the original Bill C-231 stated that if it became desirable from the viewpoint of national transportation policy to Federally control extra-provincial trucking, such control would be exercised by the new Transport Commission.[3]

The immediate intentions of the Federal Government have not been enunciated. While Royal Assent was given to the Transportation Act in February 1967, at that time the Minister of Transport, the Honourable J.W. Pickersgill, gave assurances to interested parties, e.g., the Trucking Associations and provincial authorities, that Part III of the Act would not be invoked before a Federal-Provincial conference on truck control was held. While it was expected that the conference would be held in the Fall of 1967,[4] it did not take place. Probably action to implement Part III will not be instituted until well into 1968.

ATTITUDES TOWARD TRUCKING CONTROL

Federal Government Action Prior to the National Transportation Act

While extra-provincial trucking has always been regulated by the provinces (see Appendix XXI, sheet one), with first nine, and later ten, sets of regulations existing, in the past two or three years the Department of Transport of the Federal Government has been indicating that the above change regarding control was being contemplated. As shown in Appendix XXI, sheet two, in 1954 a Privy Council decision stated that under the British North America Act trucking which crosses provincial borders is a matter for Federal jurisdiction. Immediately subsequent to the decision, Federal authority over extra-provincial trucking was delegated to the provinces by the Motor Vehicle Transport Act.[5]

The three major reasons which have been advanced by the

Federal Government for the considered change in control are, first, that the MacPherson Commission report recommended that in those areas where competition between modes of transport exists, legislation and regulation should be such as to allow each mode to compete freely and to obtain its fair share of the transportation market. Second, that because of the growth in extra-provincial trucking, a new type of regulation is required. A representative of the Department of Transport, in commenting on this matter, stated that in 1954 when this segment of trucking was made a Federal responsibility it was small, it was adequately dealt with by the provinces and the Federal authorities felt that the relationship should be continued.[6] Third, because of present litigation (mentioned shortly) it was felt that the necessary legislation will be available if it becomes mandatory for Federal authorities to assume direct control of extra-provincial trucking.[7]

To pursue its new policy approach, in the Fall of 1964 the Department of Transport established a Railway and Highway Branch to study Canada's highway transport.[8] Early in 1966, the Honourable Mr. Pickersgill suggested that a new board would have to be formed which would have an integrated approach (i.e., each mode would be fitted into the transportation complex so that it may function at its best level and to the best of its ability). The board would take over the functions of the then existing controlling bodies.[9] The Canadian Transport Commission is the new Board referred to.

In June 1966, while Mr. Pickersgill was attending a transportation conference, the subject was raised as to whether or not road transport should be included under the new authority. One question asked was whether road transport would not have to be included to make the proposed authority effective. The Minister replied:

> There is no question that we have to exercise some of the jurisdiction which the Privy Council 12 or 13 years ago decided we had....I remember very well that Mr. St. Laurent decided to delegate the federal jurisdiction in these provincial agencies. I said to him I thought it was a good stop gap but it would only last about ten years.
>
> I said, ultimately, we have got to recognize when the Trans-Canada is completed that we will have to exercise our responsibility....By whatever method is used it seems to me that if we are going to have the most efficient transportation in this country we are going to have to have integration.[10]

The Trucking Industry's Position

Possible Change in Position. The Federal authorities have taken the first steps towards direct regulation of the various modes of transport in order to have a well-integrated transportation system, i.e., each mode operating at its optimum. While the attitude of the Canadian Trucking Associations, Inc., (the representative body of the seven provincial trucking associations) has been against such action as far back as the 1930's (see Appendix XXI, sheet one) and up to as recently as two years ago (1965), their position towards direct Federal regulation appears to have become more favourable.

Early in 1965, Mr. John Magee, General Manager, Canadian

Trucking Associations, Inc., stated that the trucking industry did not want "one super federal authority" for the control of extra-provincial transportation. He said it would create "...another bureaucratic colossus in Ottawa preoccupied mainly with railway problems..." He further stated that the trucking industry would like stronger legislation setting out the ground rules for extra-provincial trucking and "...the provincial boards would function as one unit..."[11] Failing this approach he said the trucking industry would seek a separate Federal motor carrier board.[12]

A little over one year later Mr. Benoit Savard, then Assistant General Manager of the Canadian Trucking Associations, Inc., was discussing possible Federal control of extra-provincial trucking at the Quebec annual trucking convention in Quebec City. One statement which appears in his address, is:

> Let us ask ourselves whether we would not rather be there, like the other forms of transport, when national transportation policies will be formulated or whether we will be kept outside looking in, because of our resistance to direct federal control over the extra-provincial portion of our industry.
>
> One can argue, of course, that because a government is not involved in direct regulation of an industry is no reason for it to keep the industry on the outside looking in when the government makes policies which may affect this industry. But to be realistic about it, if the government has assumed no responsibility for the industry in regulating it, other government policies which may affect the industry tend to ignore its interest.[13]

By the Fall of 1966, during the Standing Committee hearings on Bill C-231, the Trucking Associations went as far as to recommend that the cross-border portion of extra-provincial trucking companies

be regulated by the Federal Government, and that the intra-provincial portion be regulated by provincial authorities.[14] However, at one point in their submission while commenting on the present system of extra-provincial regulation, the following comment appeared:

> It is apparent that although the existing system of extra-provincial regulation is inherently unworkable, and in no sense can be construed as an acknowledgement of federal responsibility in the field of extra-provincial truck control...[15]

The suggestion for Federal control of cross-border trucking was not adopted. It would appear to be difficult to implement because of the division that would be necessary in each company. Nevertheless, the recommendation indicates some change in the Trucking Associations' position, at least from their earlier stand.

Further, the Associations made six suggestions on Part III. These were adopted in the Legislation. They are shown in Appendix XXII.

In the past two years, accompanying this change of position, the rapport between the officials of the Department of Transport and the members of the trucking industry would seem to have been very good. Various articles on Federal recognition which is being given to the industry have appeared in the industry's magazines.[16]

The Motor Vehicle Act. While the trucking industry was outspoken against Federal control, it desired Federal recognition on railway rate hearings and similar matters. Further, for the past seven or eight years it has been outspoken against the shortcomings of the Motor Vehicle Act,[17] which enables each provincial board to

act as a Federal agency for control of extra-provincial trucking.

Some of the criticisms of the present arrangements are, first, that there is a lack of joint hearings by provincial boards. An extra-provincial application for operating rights requires at least two hearings, presenting the same evidence to two boards. If five provinces were involved, five hearings would be necessary. The operator must have legal counsel in each case. One operator has stated that it cost his company approximately $3,000 to obtain operating rights in British Columbia.[18] If three provinces were involved the cost could probably double or even triple this amount. In addition to the explicit costs, there are implicit costs because of the fact that key personnel must devote considerable attention to these problems, at the expense of other pressing matters.

Second, there is no guarantee that the running rights will be granted in all provinces approached. If they are not, the trucking company could find a discontinuity in trucking rights. For example, a company might enjoy rights in Ontario and New Brunswick, but not in Quebec.

Third, appeal procedures and guidelines are different in the different provinces. Operators often find themselves confused with the different situations existing.

It would appear that a uniformity for all provinces is necessary. To operate effectively and, thus, benefit the nation, the trucking industry is entitled to the elimination of confusion, and to the elimination of an unnecessary consumption of time and expense.

Clearly delineated policies which will be applied nationally are essential. Can this be achieved by provincial control and at the same time, can the interests of the industry be completely protected vis-a-vis other modes of transport regulated by Federal authorities; or should extra-provincial trucking be under Federal control?

FEDERAL VERSUS PROVINCIAL REGULATION

PROVINCIAL REGULATION

Advantages

What are the advantages of leaving extra-provincial trucking under provincial control?

A History of Provincial Regulation. For many years the provincial authorities have regulated trucking. It is their position, and that of others connected with the industry, that traditionally the industry is provincially oriented. For the good of the nation, whether it would be valid or not, they feel traditional control patterns should be preserved. This would unquestionably encourage greater harmony between the Provincial and Federal authorities and provincial autonomy would be recognized.

However, to what degree should provincial autonomy be recognized in this instance? Prior to the Privy Council's decision in 1954 the legality of control was unsettled. Provincial autonomy was legally in question. Once it was decided that extra-provincial

trucking was a matter for Federal control then there was no legal provincial autonomy involved. The autonomy basis used for delegating the responsibility was that of tradition. Probably in 1954 this basis could justify the action. Today, however, with a fast-changing transportation complex, it is questionable whether tradition is a sufficient basis for continuing provincial control.

Experience. Provincial authorities have a long record of experience with respect to trucking problems and are conversant with the particular areas in their jurisdictions. As is shown later in this chapter, the Federal authorities recognize the experience and the facilities of the provincial jurisdictions.

Hearings on Railway Rates. While one major problem of the past has been the inability of the trucking industry to make representation regarding railway rates, this obstacle has now been removed with the National Transportation Act, as mentioned in Chapter IV. Probably it can be considered an advantage in that it is no longer an adverse factor to provincial control.

Disadvantages

Lack of Uniformity. As mentioned earlier, one of the major problems with provincial control is lack of uniformity. Confusion exists for the trucking operators. Could this be cured by having the ten provincial boards guided by one Act, or have one Federal motor carrier board - the two suggestions advanced by the Trucking Associations?

First, to have ten provincial boards act as one unit would be welcome. It is, however, an extremely optimistic thought. The attitudes of the provinces vary significantly. It is unlikely the sum total of provincial interest will add to that of the national interest. Even though one master plan may be set out by the Federal Government, the arrangement could be fraught with problems resulting from differing desires, opinions, interpretations and approaches. It is questionable whether any great improvement could be made over the existing arrangement of ten control bodies, where some measure of cooperation has been achieved but which still leaves much to be desired.

The provincial authorities have all realized the difficulties of the present situation, as evidenced in the excerpts in Footnotes 11 and 17 of this chapter. Nevertheless, joint hearings have not been arranged. This is a step which could greatly facilitate issuance of extra-provincial trucking licenses. Such action would eliminate multiple hearings for the trucking operators. In one article the Trucking Associations infer that legally the provincial bodies cannot act jointly.[19] If such is the case, surely the provinces could have undertaken steps to encourage early action on the part of the Federal Government so that joint hearings could be held. The autonomy which each province desires would seem to inhibit the possibility of ten provinces working as one unit.

Second, it was mentioned earlier that the Trucking Associations suggested the possibility of one Federal motor carrier

board. It is highly unlikely that much would be achieved towards a well-integrated policy with a fragmentation of control by having separate federal boards and commissions. Little more would be achieved than under ten provincial boards. With each separate board or commission different policies would be formulated and would be implemented. To hope to bring together five separate control entities for a well-integrated transport policy, or for that matter even two bodies, would again be an optimistic thought. In all likelihood each entity would travel its own particular way and integration of policies would be secondary at best. From the writer's experience in relation to various governmental bodies, and the problems in bringing groups together for a well-coordinated effort, one control body could unquestionably accomplish a great deal more than could separate control entities.

Increase in Extra-Provincial Trucking. Between 1958 and 1963 extra-provincial trucking increased by one-third.[20] While this type of traffic is not a large part of the total, it is growing. With better highways, better equipment and possible increased lengths and weights for equipment allowances on highways, it would seem that growth can be expected. One inhibiting factor could be the Canada Labour Code, dealt with in Chapter VI.

Extra Time and Cost. It was pointed out earlier that unnecessary costs and time are required for multiple hearings when operators desire to obtain operating rights.

FEDERAL REGULATION

Advantages

If and when Federal control is effected in respect of extra-provincial trucking operations, what advantages would there be?

Inclusion in National Policy. If extra-provincial road transport were included in the Federal group of transport industries, it could become part of the whole complex and would not just be in a position to make representation on railway rates. Every policy laid down could be so formulated that the greatest benefit would be achieved for the nation.

Uniform hearings, procedures, criteria, and/or interpretations could be used for granting licenses; for hearing appeals; for consideration of suspensions, cancellation or amendment of licenses; for the consideration of tariffs and the filing thereof; for rate-making and costing procedures; for safety and operational factors; for keeping of accounts; for control, transfer, consolidation, merger, or lease of an operation; for requirements re uniform bills of lading and insurance; for investigations; and for penalties. No discrimination would exist for any mode of transport because uniformity could be applied to all.

In theory it could be reasoned that this could be the case with provincial control. As stated by Mr. Savard, in practice it would be very doubtful.

Importance of Trucking. With the increase in longer-distance trucking, extra-provincial operations are becoming more and more of national importance.

Provincial Versus National Interests. There is a great diversity of provincial interests, which is an inhibiting factor of uniform control. Provincial interests do not necessarily favour the national interests. They are local in nature and rightly so. However, it would seem that extra-provincial road transport should be free from such provincial interests and the national interest should be pursued for any interprovincial work or undertaking.

One Application. The time and cost could be reduced, as one application could suffice for granting running rights through a number of provinces. Appeal procedures would be standard and confusion should be eliminated. As is shown in Appendix XXII, the Federal authorities would endeavour to use provincial examiners. The procedure which would be followed in hearings is not known, but it is presumed that only one hearing would be held. Otherwise some of the benefits of Federal regulation would be nullified.

Competition. One objective of the National Transportation Act has been to encourage competition to the greatest degree possible. While competition has been evidenced for road transport over the years, and it would not be an added advantage under Federal control, its benefits would be preserved and not eliminated by a change in control.

Disadvantages

Federal-Provincial Relations. There may be some unsettled relations if direct Federal control of extra-provincial trucking were effected but the provinces have had some time to become acquainted with the possibility. Further, they realize that extra-provincial trucking is a matter for Federal regulation.

Experience. The Federal Government does not have the experienced staff for trucking regulation which the provincial governments have, but the Rail-Highway Department of the Federal Department of Transport has expanded and now has some personnel which is familiar with highway transport problems. Further, Part III of the Transportation Act contains provisions to utilize provincial facilities wherever possible.

Extra-Provincial Operations. There could be some difficulty involved in what may be considered an extra-provincial operation. Presumably the present criterion is if an operation has running rights in two provinces, it is then considered an extra-provincial carrier. In Ontario the question arose as to whether a carrier was subject to Provincial or Federal legislation for labour matters. The Court ruled that while the carrier involved transported only two per cent of its traffic in extra-provincial service, and on an irregular basis, it was, nevertheless, available for service and should be considered as an extra-provincial operation.[21] This could cause difficulty. Prob-

ably the outcome will be, even under present arrangements, that if a carrier desires to be extra-provincially classified it will retain or extend such operations. On the other hand, if it desires to be considered as an intra-provincial operation, it will retain running rights for only one province. Undoubtedly, this matter will sort itself out over a period of time.

Present Litigation

There are two matters of litigation which may force the Federal Government to take direct control of extra-provincial trucking. First, there is a case before the Supreme Court of Canada (instituted by the Great West Transport Company, Winnipeg) in which the delegation of Federal authority over extra-provincial trucking is being contested. The carrier maintains that the authority of the Federal Government cannot be delegated. While the case was lost in the lower courts, the Supreme Court may take a different view.

Second, another difficult situation has arisen in Manitoba. Kleysen Cartage of Winnipeg received a judgment from the Manitoba Court of Appeal which indicated that the Motor Carrier Board of Manitoba may not have the right to regulate an interprovincial carrier operating out of the Province.

CONCLUSIONS

As time has passed royal commissions, governments, and transportation men have more fully realized the necessity for each mode of transport, and that each mode has a sphere in which to operate. Further, it is realized that each is a valuable regulator in the transportation market place to accord to the shipper the best service at the lowest cost possible. After examination of all the advantages and disadvantages listed above, the writer is persuaded that extra-provincial road transport would be better able to compete and better able to aid in regulation, if placed under Federal jurisdiction. It would then be fully included in national transportation policy. If it is better able to compete, the nation will benefit.

The major point in favour of provincial control is tradition. This is not a strong point in a fast-changing transportation industry. Change must be faced. This is especially so when no legal provincial autonomy is involved. Nevertheless, while legally the Federal Government has control of extra-provincial trucking, the Honourable Mr. Pickersgill has pointed out that the provinces have control of the roads. Therefore, if the Federal authorities take direct control of extra-provincial trucking, a reasonable amount of administrative cooperation will be required from the provinces. The Minister feels a Federal-Provincial conference is necessary before taking any action to invoke Part III of the National Transportation Act. As mentioned earlier, this is why he has given assurances that

such a conference will be held before any action is taken.

The chapter which follows deals with Federal labour regulation of extra-provincial trucking, a subject closely tied to this subject of control.

FOOTNOTES FOR CHAPTER V

1 Aeroplanes will probably make greater inroads on motor vehicle traffic in the next few years.

2 These are listed in the Canada Gazette, Part I, October 23, 1965, in connection with the Canada Labour Code, the subject of Chapter VI of this thesis.

3 See the original Bill C-231 (Ottawa: Queen's Printer), August 29, 1966, p. 15.

4 Georges C. Gouin, Op. cit., C.T.A. Reports, Maritime Truck Transport Review, February and March, 1967, p. 19.

5 2-3 Elizabeth II, Chap. 59, 1954.

6 A.L. Peel, "How Highway Transport Fits into Federal Planning on Land Transportation," Western Motor Fleet (Regina: Mercury Publications, Limited), February, 1966, p. 8.

7 Transport Review, Canadian Trucking Associations, Inc., Op. cit., February 1, 1967, p. 3.

8 A.L. Peel, Op. cit., p. 8.

9 As mentioned previously, The Board of Transport Commissioners for Canada has been the regulatory body for rail transport. The Maritime Commission has regulated water transport, while the Air Transport Board has regulated air transport. Also, not mentioned, and not included, is The National Energy Board for Canada which is the regulatory body for oil and gas pipelines.

"Integrated Transport Authority Proposed," Western Motor Fleet, Op. cit., April, 1966, p. 6.

10 "Railways Are Warned Below Cost Rates To End With Coming Transport Legislation," Maritime Truck Transport Review, Op. cit., August, 1966, p. 5.

11 "Integrated Transport Authority Proposed," Western Motor Fleet, Op. cit., April, 1966, p. 8.

Also, the following excerpt outlines the Trucking Associations' position on Federal regulation in 1965. It was extracted from the Associations' submission to the Standing Committee on Railways, Canals and Telegraph Lines, concerning Bill C-120:

> The most desirable solution, in our view, would be one which would continue the Federal Government's policy of placing in the hands of provincial regulatory boards responsibility for controlling and regulating extra-provincial highway transport. On the other hand, the solution can no longer be one which invests ten provincial truck regulatory boards with completely sovereign powers to control the extra-provincial trucking industry as ten federal boards, operating on ten different policies of how regulatory applications should be processed.
>
> Canadian Trucking Associations does not in itself favour direct federal control of highway transport by a centrally located board in Ottawa, any more than does Parliamentary policy appear to favour it. We believe that in a vast, sprawling industry, whose operations extend into every habitable area of Canada accessible by road, provincial boards are closer to the problems of the industry....

Submission to Government of Canada on National Transportation Policy (Ottawa: Canadian Trucking Associations, Inc., January, 1965), p. 7.

12 "Integrated Transport Authority Proposed," Western Motor Fleet, Op. cit., April, 1966, p. 8.

13 "Trucking Industry's Problems Outlined in Quebec City," Maritime Truck Transport Review, Op. cit., March, 1966, p. 11.

14 Submission to Standing Committee on Transport and Communications, House of Commons, Ottawa, Canada (Ottawa: Canadian Trucking Associations, Inc., November, 1966), p. 17

15 Ibid., p. 18.

16 For example, see "Hope and Optimism at Last for Inclusion of Trucking Industry in National Policy," Maritime Truck Transport Review, Op. cit., December, 1965, p. 1.

17 Following is an excerpt from page 6 of the Submission mentioned in Footnote 11 above:

> ...while we do not attribute a direct opinion to any individual we make the flat assertion that there is not one single administrator and regulator, responsible for control of the trucking industry at

provincial level in this country, who does not believe that far-reaching amendment and reorganization - if not repeal and complete replacement - of the Motor Vehicle Transport Act is a pressing necessity.

18 Dixon and Sons, Ltd., Burnaby, B.C.

19 Truck Transportation (Toronto: The Automotive Transport Association of Ontario, Inc.), April, 1965, p. 21.

20 D.B.S., Motor Transport Traffic, National Estimates, Op. cit., 1958 and 1963. (See Interprovincial and International Traffic).

21 A 1965 decision in the Ontario Courts would seem to indicate that in that jurisdiction the amount of traffic a company transports in extra-provincial service does not determine for control purposes whether the carrier is in the intra-provincial or extra-provincial category. Tank Truck Transport, Ltd. (1960), established that only two per cent of its operations were in extra-provincial service and that this was on a casual and unscheduled basis. The dispute to be resolved concerned a labour matter and whether the Company was subject to the Federal Industrial Relations and Disputes Investigation Act. The Court ruled that the deciding factor was not the amount of traffic but that the Company was ready and willing at any time to transport traffic in extra-provincial service and, thus, it came under Federal jurisdiction.

See: Monthly Bulletin (Vancouver: Automotive Transport Association of B.C.), August, 1965, p. 5.

CHAPTER VI

LABOUR AND SAFETY LEGISLATION

INTRODUCTION

The two remaining pieces of Federal legislation which have had and could have significant effects on Canadian trucking, are the Canada Labour (Standards) Code, and safety legislation which is now being prepared.

CANADA LABOUR (STANDARDS) CODE

Appendix XXIII briefly outlines the Canada Labour Code and the circumstances relating to extra-provincial trucking. It will be noted that while the various provisions of the Code were to be effective July 1, 1965, by 1967 the hours-of-work provision had not been applied to motor transport. For this group, the Minister of Labour temporarily deferred to July 1, 1968, the application of Part I of the Code, which relates to hours of work.[1]

The four main provisions of the Code are a forty-hour work week, a minimum wage of $1.25 an hour, two weeks' vacation with pay and eight general (statutory) holidays each year. Of these four, the major problem is presented by the provision for hours of work.[2]

On April 5, 1967, the Minister of Labour appointed an Inquiry Commission to study the hours-of-work provision as relating to the trucking industry. Hearings were held in Ottawa during

August 1967. It is expected that a report will be forthcoming from the Commission by the end of 1967 (see Appendix XXIII, sheet two).

Problems Regarding Hours of Work

There are three aspects of the provision for a forty-hour work week which have and could cause concern for trucking operations. First, limitations would be placed on extra-provincial trucking. Those companies which cross provincial borders are generally those with the longer-distance runs. The Code applies directly to these extra-provincial companies. Second, there would be an effect on employees' earnings and, third, there will and has been an effect on intra-provincial trucking.

Limited Hours. If the Canada Labour Code is applied to extra-provincial trucking, which would involve about 1,000 companies, as stated in Chapter V, a maximum of eight hours a day and forty hours a week would seem to be extremely limiting for trucking longer distances. Any trip exceeding three hundred miles could barely be completed in the regular work day. Travelling at fifty-five to sixty miles an hour, a truck could probably average forty to forty-five miles an hour for the trip. While there is the possible use of overtime, this provision is limited to eight hours a week, and, furthermore, it would result in a more costly operation (the hourly rate at time and one-half). To some extent, this would inhibit the ability of the trucking operation to compete with other forms of transport.

Where a company is faced with irregular traffic, the Code would be an exceptional burden. For example, the General Manager of Hendrie and Company, in Ontario, states his Company hauls heavy equipment, and on certain occasions seven hours may be required; while on others nine hours, or even more may be required. Unforeseen problems, route diversions and similar factors can cause considerable delays.[3] This is only one of numerous situations which could occur for longer-distance trucking, i.e., in the intermediate- and long-haul markets.

Sleeper Cabs. It may be contended, and as the Minister of Labour has stated, that other forms of extra-provincial transportation are faced with the same conditions. While this is true, the other modes of transport do not have quite the same problems with which to cope. For example, the railways, which are the trucking industry's strongest competitors, have terminals across the nation. This enables a relay operation, as employees are located throughout the Country.

One device utilized by the trucking industry to compete with the railway relay operation for long-distance hauling has been the use of sleeper cabs. Two drivers are involved and each has a turn at driving while the other rests. A continual operation is provided. The future value of the sleeper cab would seem to be limited should the hours-of-work provision of the Federal Labour Code be implemented. If each driver is allowed to work eight regular

hours in twenty-four plus one or two hours of overtime, three men would be required for a continual operation. This would increase costs considerably. The number of long-distance truck drivers could increase thirty-five to forty per cent. Also, equipment requirements could increase by twenty-five per cent.[4] Failing the use of additional truck drivers, relay stations may have to be set up along a run but this would be expensive and probably prohibitive for trucking operations to remain viable.

The continuity of the run in a long-distance trucking operation enables early delivery. For example, trucking operations from Calgary and Edmonton can effect a fourth morning delivery in Toronto, while rail piggyback makes a fifth morning delivery. Without a large increase in costs, this could not be accomplished under the Code. Furniture van lines will also be seriously affected. One estimate is that rates will increase twenty-five per cent for the long-distance movement of household goods if the van lines are to maintain their competitive position.[5] Increased rates would undoubtedly have a depressing effect on the demand for van line services.

Necessary Latitude. It is not denied that trucking employees should enjoy a work week comparable to the majority of other employees in society. However, intercity transportation in Canada, where distances are great, should not be considered as a standard "punch clock" operation, especially for longer-distance

drivers. To do so will have a deleterious effect on trucking operations. Now that the Labour Code has been enacted, probably the most suitable arrangement for extra-provincial trucking companies would be to exempt long-distance truck drivers, allowing them to remain on their present mileage payment arrangements. This procedure is followed in the United States where only safety factors limit driving time.

If the Federal Department of Labour eventually decides that the forty-hour week should be applied to all extra-provincial trucking, then the greatest of latitude should be allowed the trucking operations in the arrangement of work hours. There is a provision for averaging hours but this is limited to thirteen weeks (see Appendix XXIII, sheet two). There would seem to be much more latitude needed. The additional costs for the trucking industry to apply the Code will be burden enough without further increasing such costs because of built-in rigidities in operational requirements in the hours-of-work pattern.

Various arrangements should be allowed in order to aid extra-provincial trucking to cope with the situation. For example, innovations such as allowing a worker to work 2,000 hours a year plus 400 hours overtime could be considered. Hours could then be arranged to suit the trucking operation. The rigidity could be placed on a yearly basis rather than on a weekly basis. This could facilitate longer hours during the peak seasonal periods and, thus, enable

the employees to earn the best possible income. It would also aid the employer to meet demands in a rush period. Another arrangement might be to allow 1,000 hours to be worked within a six-month period and the second 1,000 hours in the succeeding six-month period, with the 400 overtime hours worked if and when required. Other short-term arrangements may be to allow a driver to work forty regular hours plus eight hours overtime within a four-day period, extending to him three successive days of leisure. While such arrangements would increase costs, at least they would allow better utilization of equipment which is extremely important in transportation operations.

Overtime Study. While work weeks are being reduced, the trend in hours worked is interesting. The United States Bureau of Labor Statistics published a study in the latter part of 1966, which shows that more and more people in the United States are working longer hours. From 1948 to 1965 the number of non-farm workers who work more than forty-eight hours a week increased from 4.8 million to 9.4 million - from 12.9 per cent to 19.7 per cent of the full-time, non-farm work force. Forty per cent of those involved work sixty or more hours a week. Some work overtime, others work in a second occupation. The average hours for all non-farm workers was forty-five hours a week in 1965, which is about the same as in 1948.[6]

Demand for Labour. If the Code is applied to extra-provincial operators across Canada the logical course for trucking operations would seem to be a contracting-out of the work, especially

for longer distances. This could be accomplished by greater utilization of railway piggyback, container operation and owner-operator leasing arrangements. Whether owner-operator arrangements could circumvent the Code and not be declared illegal would be a point for consideration.

Nevertheless, if the Federal Department of Labour has as its objective an increase in total positions, which could well be the case, the increased costs may result in greater use of contracting-out, a situation to which employee groups may strongly object, and there probably would be a greater use of technological innovations such as piggyback. This could result in a reduction in the number of positions rather than an expansion. Capital would be substituted for labour. While objection should not be raised if transportation costs are reduced or are restricted by the use of capital innovation, there would be the question of the displaced workers, an important point for consideration. Assuming proper adjustment could be made for the workers involved, there is still another factor to be considered. Road-rail competition would be reduced with the curtailment of distance trucking.

As was pointed out earlier, the growth of the trucking industry was one important factor in the introduction of competitive rates by the railways. Removal of the effectiveness of distance trucking could conceivably have the reverse effect, with possible increased transportation costs to the shipper.

The degree of effect the Code would have on either increasing or decreasing labour demand is difficult to predict. It would likely decrease demand for long-distance trucking, with a resulting decreased labour demand and a confinement of this mode of transport to shorter hauls. At best, it is unlikely long-distance trucking would display any growth and its effectiveness as a regulator would be curtailed.

Earnings and Employees' Attitudes

A second major consideration is the fact that with the reduction of work hours, a reduction in earnings would result. There was not a provision included in the Code for maintenance of earnings because the Minister stated that he felt wages were a matter for collective bargaining.[7]

As an aside, there would seem to be an inconsistency existing. Why should the Government legislate for hours of work, statutory holidays and vacations, and treat wages in a different manner? One might understand that in situations where long hours are worked, the maximum hours may need to be legislated to a point of, say, forty-eight hours per week. This same principle is being applied in regard to minimum wages being set at $1.25 an hour. It would seem that the Government's role for maximum hours of work should be similar to minimum wage action rather than taking a very prevalent level of hours (forty hours) and legislating on that base. The same would apply to the other collective bargaining items such as statutory

holidays and vacations, although a minimum vacation of two weeks would not seem to be excessive, nor the provision of eight statutory holidays. Yet many workers today enjoy no more than these provisions and their benefits were established by collective bargaining.

Returning to the question of reduced earnings, if the forty-hour week is applied to extra-provincial motor carriers, employees' earnings will be reduced according to hours worked. For example, an over-the-road driver who is allowed to work 3,000 hours annually today, would be reduced to 2,000 hours. Thus, if he were presently earning $6,000 a year (the more experienced drivers earn as much as $8,000) he would be reduced to $4,000 with some additional hours for overtime payment. This prospect of reduced earnings has not augered well with the employees, and criticisms have been levelled by some who feel that their overtime should not be limited.[8]

The natural outcome of a reduction of earnings will be a Teamsters' Union drive to pressure wages to their old level and beyond. It has been estimated that to maintain earnings for employees with the new legislation in effect, a twenty per cent increase in costs would result for the industry.[9] As shown in the section below, the Teamsters' Union has taken its guidelines from the Federal legislation for hours of work and has achieved a settlement of maintenance of earnings. There was a prolonged strike in Ontario early in 1966, with serious effects on the intra-provincial trucking group of carriers, as well as on the extra-provincial carriers involved.

There would be a three-way cost increase to the motor carriers if the Code is invoked as at present. There would be an increase to the employees plus the cost of additional employees, and the cost of additional equipment.

Intra-Provincial Trucking

Federal Government Action. As described in Chapter V, the Federal Government is considering taking direct control of extra-provincial trucking companies, a step which would seem to contain merit. However, there would be a dichotomy in trucking control and great care would have to be exercised by the Federal Government in its actions so that a proper functioning of the whole industry would result. The Federal Government's entry into the labour field, in this instance, setting out maximum hours of work and other provisions, generated a very complicated situation. Under the Federal Labour Code there exists a lower maximum limit on hours than those maximum limits existing under the provincial legislation and provincial collective agreements. Appendix XXIII, sheet three, shows a comparison of Ontario legislation and Ontario collective agreements with that of the Federal Labour Code at the time it was enacted.

To have uniformity the Federal Government had the intention of asking the provincial governments to bring their labour standard legislation into line with the Federal Labour Code.[10] One report stated that the Ontario Labour Minister, for example, was not

receptive to such a step. He said that the maximum work week for that Province would not be reduced below forty-eight hours. The following words are attributed to him:

> At a time when manpower itself, not to mention skills or semiskills is in extremely short supply, it would be foolhardy to shorten hours of work below today's prevailing levels.[11]

In any event, regardless of what minimum standards may be prescribed by legislation in the provinces, in 1966 the Teamsters' Union took the initiative to obtain for intra-provincial trucking operations the standards set out in the Federal Labour Code. Nevertheless, extra-provincial carriers have not yet (1967) had to implement the Code because of the deferment granted.

Strike Action. A fourteen-week strike and lockout (some firms were struck, others closed down) of 8,500 trucking employees, affecting fifty-five Ontario companies, commenced on January 20, 1966 and ended May 1st. The following is an excerpt from an article commenting on an offer made to the employees to effect the forty-hour work week by October 1968:

> They want the 40-hr. week and they want it next year. 'It's the law.' said a Teamster business agent to F.P. (Financial Post), referring to the code. 'Our people feel they are justified in asking for it.'[12]

Final settlement resulted in a step-by-step implementation of the forty-hour week by January 1, 1968.[13]

An anomalous situation has occurred. The Code which was to apply a forty-hour work week to extra-provincial trucking operations

has actually precipitated the implementation of the forty-hour week by 1968 in intra-provincial trucking operations in Ontario (long-distance drivers excepted). Hourly-rated employees of extra-provincial carriers in Ontario also will receive the forty-hour week on the same settlement basis by 1968. Hourly-rated employees of extra-provincial carriers in Quebec were scheduled to receive a forty-four hour work week, on a step basis, by October 1, 1967. The only limitation on highway drivers in Ontario is 2,100 miles per week and, in Quebec, 2,200 miles per week.[14]

This standard pattern set in Ontario will no doubt be pursued by the Teamsters' Union across all provinces. Whether other strikes will occur is difficult to say as the settlement pattern has been delineated in Ontario. Yet other areas of Canada, such as Western Canada and the Maritimes are probably less able to afford the additional cost of higher freight rates. Further, it would seem that the settlement in Ontario for intra-provincial trucking employees and extra-provincial hourly-rated employees, greatly weakens, if not almost eliminates, the possibility of extra-provincial carriers obtaining permanent exemption from the hours-of-work provision of the Federal Labour Code. This was the objective sought by the trucking industry. The one hope is that long-distance drivers will be exempt or be given special treatment.

It is unfortunate that the Federal Government in actual fact formulated demands for the Teamsters' Union, a strong, militant group which needs no aid in seeking better working conditions. Further, out of the Teamsters' settlement in Ontario there has come

a maintenance of earnings for intra-provincial trucking employees. Thus if the Code is applied on a blanket basis to extra-provincial carriers, the Teamsters' Union will be quick to maintain the same level of earnings for this group of employees. This could result in an immediate increase in direct wage costs of from seventy cents to $1.00 an hour for the employees involved.[15] While the Teamsters' Union may have in due course formulated demands along the lines they did for Ontario trucking employees, it would seem the Federal Government has at least hastened the day of this additional cost for the motor carrier operators involved.

Economic Results. The 1966 Ontario trucking strike took a toll on the trucking operations concerned. A conservative estimate of the weekly loss of gross revenues was $2.0 million, or $28.0 million for the whole period.[16] The General Manager of the Canadian Industrial Traffic League estimated that the trucking operations would lose at least five per cent of their traffic to competitors.[17] In more recent correspondence he stated that two months after the strike the motor carriers had not recovered all of the business they formerly had,[18] and according to press reports the 1966 rail strike was so short in duration it did not aid the trucking operations to recapture lost traffic. But had it been longer, trucking operators maintain the rail strike would have worked a hardship with them because of the premium pay required for all the additional work and the added cost for leased equipment.[19]

To ascertain the attitudes of the shippers towards the motor carrier after the trucking strike in Ontario, the Canadian Industrial Traffic League conducted surveys of its members. Some of the findings are shown in Appendix XXIV. One of the questions to 131 shippers on their appraisal of other forms of transport used in lieu of trucking, indicates that private and leased trucking, and cartage were well regarded, as was rail carload. Many of the shippers did not show great favour for rail piggyback, less-than-carload lot, express, rail international and pool car service. However, the sample was limited and probably by previous trial and error these shippers had found that the last five services mentioned did not suit their particular needs. Of 122 firms replying to a question on reversion of their traffic to their original motor carrier, only fifty stated that ninety per cent or more of their traffic would revert back. From the total survey there is enough evidence to show that after the strike was over shippers planned to use other carriers besides motor trucks and some planned to use private and leased trucking.

This strike was serious and was no doubt, at least lengthened, if not largely precipitated by the Federal Labour Code. Truck rates had been increased in the Fall of 1965. The additional costs from the 1966 strike settlement resulted in further freight rate increases of up to ten per cent, announced in the Fall of 1966. In addition, minimum rates on truck L.T.L. traffic between Ontario

and Quebec were increased from twenty-eight to seventy-one per cent.[20] This will inhibit the competitive ability of these carriers but offsetting to some extent these increased rates will be the rail rate increases mentioned in Chapters II and IV.

Other Provisions of the Canada Labour (Standards) Code

The minimum wage of $1.25 an hour would not appear to be a provision with which one could quarrel. The trucking industry has taken no exception to it and legislation of this nature for a minimum provision would not enter the major collective bargaining area. Likewise two weeks' vacation with pay would seem to be fairly acceptable and probably could be considered as a minimum today when many workers are receiving three weeks or one month's vacation. On the other hand, eight general (statutory) holidays would certainly not be a minimum which might be expected under legislation, as there are still many workers in the nation who are receiving only this or even less than this amount. In any event these three provisions have been applied to extra-provincial trucking.

In summary, the hours of work and general holidays provided under the Legislation would seem to exceed what should be legislated, as they trespass into the collective bargaining area. On the other hand, the minimum wage and vacation provisions may be expected levels for legislation, as bargaining has in many instances exceeded these minima.

Summary

While the Federal Government may have been well intentioned in its action in respect to labour standards, it has upset the collective bargaining procedures and the cost effects on the trucking industry have been and will be serious even if the Code is not implemented. Application of the Federal Labour Code to extra-provincial trucking will place a heavy burden on these carriers. It would appear now that regardless of what the Inquiry Commission may find, or what the Federal Government does, in view of what has occurred, the Teamsters' Union will attempt to place all trucking throughout Canada (including extra-provincial trucking) on a forty-hour week, without the limit on overtime.

It will not be an easy task for the trucking operations to cope with these additional financial problems. They have been faced with rising equipment and other operating costs. It may be contended that other industries under Federal jurisdiction must face the same problems. While this is true, it would seem that it may be a greater burden on extra-provincial trucking firms than on others. The present technological arrangement will not allow trucking to adapt to the Code, as easily as railways may do. Secondly, there are a large number of trucking companies in intra-provincial service, performing shorter runs. These companies will be able to adapt more easily to the new working conditions, forced on them by the Teamsters' Union, than will the longer-distance truckers who will be subject to the Code.

SAFETY LEGISLATION

It is understood that there is a Safety Bill being prepared by the Federal Government, about which little has been said. Apparently it will follow along the lines of the Federal Labour Code, and will set up minimum standards of safety. This will be applied to companies which are considered to be extra-provincial carriers. It may well be expected that provincial authorities will follow the standards set out by the Federal Safety Code. Not to do so would place intra-provincial carriers in a different category than those in extra-provincial service. If the Federal Safety Code is considered a minimum standard, then for the safety and protection of the public, such a standard should be required for intra-provincial carriers.

While the terms of such legislation are not known, if it is felt that there exists a need for safety improvement, undoubtedly costs will increase for trucking operations. Over an extended period of time the costs which may be involved in achieving safer motor carrier operations cannot but aid trucking efficiency. Accidents of all types are costly. Any reduction which can be effected in this direction will be a reduction in cost. It could well be that additional costs which may be encountered under safety legislation could be more than offset by accident cost reduction. It is to be hoped that this proposed safety legislation will help to "weed out" the inefficient and careless operator, a burden which a modern transportation complex cannot afford to bear.

CONCLUSIONS

A review of these areas of legislation reveals situations which could be detrimental to trucking operations from a cost point of view. This could inhibit their ability to compete. The Federal Labour Code will have imposed and will further impose financial burdens on the industry in an area which seemed to belong rightly to collective bargaining. However, the Labour Code has been passed. It would not be surprising to witness the application of the Code to all extra-provincial trucking operations, with the possible exception of their long-distance drivers, now that trucking operations in Ontario will have obtained the forty-hour week by January 1, 1968.[21] Safety legislation will probably result in additional cost for the industry but in the final analysis it should produce more efficient trucking operations.

While there are both detrimental and advantageous features involved in the legislation which has been dealt with in Chapters IV, V and VI, it is to be hoped that after it is finalized and effected, strong, well-operated motor carrier operations will emerge. This mode of transport, together with other modes, is essential to the economic well-being of Canada.

In the two chapters which follow, an attempt will be made to assess major technological changes in transportation and their effect on the motor carrier industry.

FOOTNOTES FOR CHAPTER VI

1 Order in Council issued by the Minister of Labour, dated April 4, 1967.

2 Submission to the Senate Standing Committee on Banking and Commerce (Ottawa: Canadian Trucking Associations, Inc., March 4, 1965), p. 4.

3 "Haulers Seek New Rules, Relief on Overtime," The Financial Post, Op. cit., November 19, 1966, p. 17.

4 Summary Submission to Commission of Inquiry Into Hours of Work, C.A.L. Murchison, Q.C., Commissioner (Ottawa: Canadian Trucking Associations, Inc., August 11, 1967), pp. 15-16.

5 W.J. Crichton, "The Labour Code: An Act of Violence," Canadian Transportation (Toronto: Maclean-Hunter Publishing Company, Limited), December, 1965, p. 34.

6 Peter Henle, "Leisure and the Long Weekend," Monthly Labor Review, United States Department of Labor (Washington, D.C.: Government Printing Office), July, 1966, pp. 721-727.

7 While it cannot be documented, it is the writer's understanding that the Minister of Labour took this position.

8 Discussion between Mr. W. Morris, Automotive Transport Association of B.C., and the writer, July, 1966.

9 J. Donaldson, Manager, Motor Transport Industrial Relations Bureau, Toronto, Witness for Canadian Trucking Associations, Inc., at Senate Hearing on Bill C-126.

10 Bus and Truck (Toronto: Maclean-Hunter Publishing Company, Limited), December, 1964, p. 15.

11 "Hours Code is Nub in Truckers' Strike," The Financial Post, Op. cit., April 16, 1966, p. 7.

12 Ibid.

13 The major terms of settlement were retroactive pay of $165; an immediate work-week reduction from forty-eight to forty-four hours and twenty-five cents an hour increase; a forty-two hour work-week and twenty cents an hour increase effective January 1, 1967; a

forty-hour work-week and fifteen cents an hour effective January 1, 1968; and a ten cent an hour increase on May 1, 1968.

"Ontario Truckers Reach Settlement," Western Motor Fleet, Op. cit., April, 1966, p. 12;

and

Bulletin Issues 4286 and 4287 (Toronto: The Canadian Industrial Traffic League), April 29 and May 6, 1966.

14 Letter from Mr. J.A. Donaldson, Manager, Motor Transport Industrial Relations Bureau of Ontario (Inc.), Toronto, to the writer, dated September 7, 1966.

15 Letter from Mr. J.A. Donaldson, Manager, Motor Transport Industrial Relations Bureau of Ontario (Inc.), Toronto, to the Hon. Allan Joseph MacEachen, dated December 16, 1964.

16 "'Conservative' Estimate of Loss $2 Million Weekly for Truckers," The Financial Post, Op. cit., March 26, 1966, p. 9.

17 Ibid. Mr. Eric Gracey.

18 Letter from Mr. Eric Gracey, General Manager, The Canadian Industrial Traffic League, Toronto, to the writer, dated August 4, 1966.

19 "Rail Strikes Have Put Trucks in 'Big League'," The Financial Post, Op. cit., September 10, 1966, p. 22.

20 Letter from Mr. E.J. Roberts, Canadian Transport Tariff Bureau Association, Toronto, to the writer, dated July 19, 1967. According to Mr. Roberts, the general average increase was eight per cent.

21 As this document was being typed in final form, on October 10, 1967, the Minister of Labour announced the Inquiry Commission's recommendations. From news reports the main recommendations were:

1. Office workers be brought within the Code, with a maximum of forty-eight hours a week, with any hours over eight in a day or forty in a week to be paid at overtime rates.

2. Ten hours a day and sixty a week the maxima for highway drivers, effective July 1, 1968.

3. A further study of the hours before July 1, 1971. The purpose of this study would be to bring about a further reduction in hours.

This information was released by the Ottawa Bureau of the Canadian Press on October 10, 1967.

CHAPTER VII

TECHNOLOGICAL AND OTHER IMPORTANT CHANGES - PART I

INTRODUCTION

Technological and other important changes are affecting the profile of the transportation industries. Certain of these changes are integrating road with other modes of transport; others are enabling road transport to compete more effectively. The more important of these changes are piggyback operations and containerization which are dealt with in this chapter. Chapter VIII refers to railway acquisition of trucking companies, integration of air and road transport, bulk hauling, road and shed handling equipment advances, computer use, training, improved highways, and licensing changes.

PIGGYBACK

Railway piggyback operations may be considered from two aspects. First, there is the movement of highway trailers on rail flatcars, which is generally referred to as piggyback. Second, there is the movement of van-type containers by rail flatcar, which is a piggyback service and, in essence, is similar to the trailer service but the movement takes place without the trailer wheels.

For purposes of this document piggyback will refer to trailer-on-flatcar service and the movement of containers will be referred to as containerization.

Background of Piggyback

Piggyback, as we know it today, began in Canada in 1952. At that time the two major railways commenced to carry their own trailers. In 1957 the railways agreed to transport the trailers of for-hire carriers. Considerable growth, referred to shortly, was then experienced in the numbers of trailer loadings. By 1959 the two major railways had piggyback routes from coast-to-coast. Today there are four arrangements in effect. The railways transport their own trailers, trailers of their trucking operations, trailers of for-hire common carriers and some private trailers.

At the time of the MacPherson Royal Commission, piggyback operations had become an important aspect of the railways' modernization program. Because of the importance of piggyback, the Commission requested that D.W. Carr and Associates (Transportation Consultants) report on this subject. A summary of the report appears in Appendix XXV.

Advantages and Disadvantages of Piggyback

Railway Advantages. According to the Carr report, piggyback offers to the railways the following major advantages over boxcar traffic: speed, less freight handling, flexibility, adaptability, and a reduction in pilferage, loss and damage. These features have enabled the railways, with limited capital expenditures, to participate in the high-valued traffic of trucking operations. As shown in

Appendix XXV, sheet two, an example of the limited capital expenditure is the fact that a rail piggyback yard can be constructed for one-tenth of the cost of a conventional rail-type yard.

Trucking Advantages. The major advantages for trucking are, first, piggyback is beneficial in special circumstances, such as for peak loading, frosty weather and similar conditions. Second, piggyback allows an expansion of a trucking operation without a large investment. Third, trailers can be rebalanced between terminals without tractors. Fourth, there is less exposure to accidents. Fifth, some costs, such as licenses, are eventually reduced. Sixth, in some instances, such as for shorter runs, piggyback can provide a faster service than over-the-road trucking. For example, from Toronto to Montreal the elapsed time of piggyback is from seven to eight hours while a tractor-trailer combination requires ten hours. Seventh, the continuous, longer-distance hauls are generally less expensive than highway trucking. Eighth, less tractors are required. Ninth, prior to the change in the Federal Lord's Day Act, mentioned in Chapter IV, piggyback permitted Sunday movements for trucking operations.

Trucking Disadvantages. The major disadvantages a trucking operation may encounter with the use of piggyback are, first, in the short-haul field, many believe higher costs are experienced than when trailers are transported by highway. Second, there is a loss of independence by the trucking operator because he reduces his

tractor fleet. Third, in some instances piggyback is slower than highway operations. Fourth, there is less flexibility, especially for intermediate stations. Fifth, there is little supervision for such units as refrigerator trailers. Sixth, a trucking operation requires more trailers than it would require for highway transport. Seventh, trucking management loses some control over its operations. Eighth, there is a loss of advertising because the trucking company's name is not before the public.

Summary. From the railways' point of view there would seem to be considerable advantage to be gained from piggyback. From the point of view of trucking, it would seem that for short distances the disadvantages outweigh the advantages to be gained by the highway operator. For longer hauls, the reverse could be the case.

Growth of Piggyback

In its early years piggyback appeared to be a very promising development but, according to the Carr report, by 1959 some of the early enthusiasm had waned. Nevertheless, piggyback has continued to expand but not at the rate of earlier years.

Piggyback Rail Carloadings. Appendix XXVI reveals that in 1958 there were 77,109 rail carloadings of piggyback in Canada. By 1965 this had increased to 232,178 - an overall increase of 201.1 per cent. In 1958 there were 276,767 rail carloadings of piggyback

in the United States. The number increased to 1,031,210 by 1965 - a 272.6 per cent increase. Annual growth data, as shown in Appendix XXVI, reveals that in both Canada and the United States considerable growth was experienced up to 1959, but thereafter the growth rate decreased, evidencing fluctuations.

Appendix XXVI also indicates that as a percentage of total Canadian rail carloadings, piggyback has steadily increased. In 1958 piggyback loadings were 2.04 per cent. By 1965 they had increased to 5.83 per cent.

Piggyback Gross Ton Miles. Piggyback growth may be witnessed from another vantage point. Appendix XXVII shows highway gross ton miles from 1952 to 1964 (the latest data available) for Canadian National and Canadian Pacific piggyback (virtually the market in Canada),[1] as a percentage of the road-rail intercity ton-mile market. From commencement in 1952, when the railways were carrying their own trailers, to 1964, piggyback increased to 2.8 per cent of the road-rail market.

The Economic Effects of Piggyback

What are the economic implications involved in the piggyback technological arrangement? First, total road-rail tonnage traffic does not increase but rather there is only a transfer of net ton miles from the intercity road haul to that of the intercity rail haul. In addition, there is added to the net-ton-mile rail haul the

tare weight of the trailers involved. Thus, included in the data of rail intercity net ton miles are the gross ton miles of highway piggyback operations with a simultaneous elimination of piggyback net ton miles from road intercity net ton miles. For piggyback traffic, the only portion of transportation service provided by the road transport industry is the urban mileage at origin and destination terminals.

The piggyback rate charged by the railway must cover the cost of moving the contents of the trailer, the trailer and the railway flatcar. The cost of the highway movement, on the other hand, is that of moving the trailer and its contents over the highway. However, the decreasing-cost economic advantage of the railway enables that mode of transport to make very competitive rates.

The decision of the highway operator to use or not to use piggyback service can be influenced by the numerous factors mentioned earlier. While certain economies may be achieved, higher costs for line-haul movement may also be encountered. Some service advantage will be gained, while operating, public relations and management control disadvantages will be experienced. Thus while specific economic effects are important, the other intangible items are given considerable attention by the trucking operators and those factors may even exert greater pressure in the final decision than do the direct economic factors. For example, the General Manager of Gill Interprovincial Lines takes the position that the Company's indepen-

dence of the railways and the public relations of the highway movement (i.e., the Company's name is before the public) are of prime importance. Thus he is reluctant to use piggyback and does so only very sparingly.

Piggyback is suited mainly to processed and manufactured goods (which includes L.T.L., L.C.L. and express shipments). The Carr report estimated that piggyback may eventually account for ten per cent of the traffic on the railways. As mentioned, it is continuing to grow and now accounts for 5.83 per cent of total carloads. Whether piggyback will reach the suggested ten per cent may well be determined by the growth of containerization.

Fishyback

While piggyback relates to the road-rail movement of trailers, there is also a combination of road and ship transport. Trailers are placed on vessels for movement from one port to another. The popular name of this arrangement is fishyback. It can be witnessed on the St. Lawrence River and the Great Lakes, and on the East and West Coasts of Canada. It is used quite extensively in the United States. The arrangement is the same as piggyback apart from the substitution of a water vessel for a railway flatcar.

Piggyback Summary

In summary, trailer piggyback does not reduce the tonnage of the trucking operation but rather tends to change the structure

of the operation, confining it to an urban pick-up and delivery situation. The highway trailer, rather than being a road line-haul piece of equipment, becomes a net weight to the railway and is in essence a "container" or "oversized carton", with wheels, for transporting goods. Thus the prime objective should be to reduce, to the greatest extent possible, the container or carton weight. Excess weight lies in the undercarriage and wheels. Desire to eliminate this additional wheel weight would seem to hold out considerable promise for containerization which may well stultify growth of trailer piggyback.

In piggyback operations there is a substitution of the rail line-haul resources for part of those used in highway line-haul, i.e., the tractor, but the arrangement does prohibit railway contact with the shipper. The trucking operation actually becomes the shipper. This principle, however, is not a new one to the railways as pool car operations have existed for many years. With the institution of piggyback, the railways have all to gain when the traffic involved is traffic they did not enjoy previously. This traffic would bring new revenue to them. For traffic the railways once had and lost, and then had gained back by piggyback service, they would be enjoying the revenue but the shipper contact would not have been regained.

On the other hand, with the continued use of piggyback over a period of time, and with a reduction in highway tractor equipment, the trucking operation would become very dependent on the railways.

Such fears as this, and the loss of public relations, have had and will continue to have a deterring effect on the growth of piggyback. Union action could inhibit growth also. In Quebec certain Teamster Union contracts stipulate that a required number of trailers must move by highway each day.[2]

CONTAINERIZATION

Van-Type Containers

The standard van-type container which may be carried interchangeably by rail, road, air and water vehicles appears to have a promising future. General Motors Corporation takes the view that containers are the most beneficial innovation on the transportation horizon.[3]

While van-type containers can be of considerable benefit to an individual trucking operation, the more standardized the container equipment becomes, the greater will be integration between the different modes of transport. Probably the major underlying factor required for the most beneficial use of container equipment is a cooperative type of thinking which can lead to standardization. In 1966 an agreement was reached in Geneva, within the International Standards Organization, requiring standard containers to be twenty, thirty or forty feet in length, by eight feet wide and eight feet high.[4] The piercing of the international scene by standardization is a broad step forward.

The Canadian National Railways, Canadian Pacific Railway Company, Consolidated Truck Lines, Toronto, Northern Transport, Ltd., Toronto, L. Wood and Son Transport, Ltd., Montreal, Charles Harris and Sons, Ltd., Hamilton, and Dominion Electrohome Industries, Limited, Kitchener, are some of the main users and proponents of containerization in Canada. A Montreal organization named United Cargo Corp. (Canada) Ltd., owns several thousand containers and offers door-to-door service between Canada and anywhere in the world where containers can be handled. Also, there is an organization in the United States which is referred to as Integrated Container Service. It provides a pool of containers in which there participates at least nineteen steamship companies, sixteen motor carriers, six major railroads, one freight forwarder and thirteen carriers in foreign countries.[5] The United States Government uses thousands of containers for shipping delicate rocket and missile components.[6]

Van-type containers, which can be a type of mobile warehousing, offer various advantages which result in savings. Appendix XXVIII summarizes a study undertaken by Canadian National Railways on its express-freight operations. While it was found difficult to determine actual profit and service advantages, it was established that the utilization of containers in a road-rail operation could achieve a considerable improvement in service at a more economical level. Economies can be effected in pick-up operations performed by trucks, in the transfer of goods from pick-up vehicles to line-haul

vehicles, in the line-haul movement, in transfer work at intermediate terminals and in the unloading and delivery of shipments.

In Canada, as of July 1966, there was a total of 1,000 twenty-foot containers in service or under construction. The two major railways were responsible for a large number of these containers but the trucking companies mentioned and private carriers have also shown much enthusiasm.

For example, Appendix XXIX outlines the operations of Dominion Electrohome Industries, Limited. Interplant transportation costs exceeded $30,000 a year in 1962. By a conversion to container-type operation in 1963, savings of about $20,000 a year were achieved in transport costs.

Specific Advantages of Containers

The specific advantages offered by containers are varied. The main ones appear below.

Mobility. Fairly recent developments for the transfer of twenty-foot containers between road and rail vehicles, enables one man to make the operation within two minutes.[7]

Versatility. With special type power units for handling containers it is possible to use the container on a vehicle as a pick-up and delivery medium during daylight hours in congested city traffic and to transfer the container, along with others, to a line-

haul highway vehicle or rail flatcar, to be used as a line-haul conveyance during night hours. In addition, with various types of container bodies available it is possible to change a truck from a flatbed, to a tanker, to a refrigerator unit, or to a van-type truck. Such an arrangement can eliminate the necessity of power units which are not used continually.

Interchangeability. Standardization of containers (twenty, thirty or forty feet long) enables interchangeability between the four modes of transport, eliminating unloading and loading of freight.

Flexibility. Containers may be used to suit particular traffic patterns. For example, packaged goods may be transported in one direction while perishable goods may be transported on the return trip.

Economy. Apart from other economies, such as handling, the net/tare ratio of containers evidences advantage over highway trailers. The "bogie" or the wheels remain with the trailer, which constitutes 3,000 to 5,000 pounds more weight than that of a container. Further, a twenty-foot semi-trailer costs approximately $5,000, while a twenty-foot container costs approximately $3,000.[8]

Originally, and still in some instances, containers were transferred between road and rail vehicles by expensive hoists and large gantry cranes or even fork-lift trucks. The cost of such devices ($75,000 to $100,000 for cranes and $60,000 for fork-lift

trucks) can equal or surpass "circus-type" or end-to-end ramp-type piggyback trailer loading costs. However, recently developed hydraulic side-loading devices have reduced container transfer costs and have effected considerable economies over the ramp-type trailer loading. Also, there are some railroad flatcars on the New York Central System which have been fitted with turntables for transferring containers from rail to road vehicles and vice versa.

Further, to transport four twenty-foot or two forty-foot trailers in rail service requires two flatcars measuring fifty-four feet four inches. To transport four twenty-foot van containers in rail service requires an eighty-one foot flatcar. By using containers in this line-haul rail operation, as compared with trailers, a reduction of twenty-six per cent can be effected in overall length of flatcars, thirty per cent in capital investment and forty-four per cent in tare weight.[9]

In addition, an economy can also be achieved in license costs. If a twenty-foot container is used on a highway truck, instead of a trailer, a saving of approximately $200 a year in double licensing can be effected.[10]

The possibility of setting van-type containers on retractable or portable legs allows the tractor unit to deposit the container for loading or unloading, or for temporary storage, and then to proceed elsewhere to work with other containers. While trailers may also be left for loading or unloading, the cost of supplying trailers which have expensive "bogies" is much greater than van-type

containers with their relatively inexpensive portable legs.

Considerable savings can be effected in capital costs. For example, Consolidated Truck Lines of Toronto, instituted a container program and in the place of ninety-six trucks, the Company acquired seventy-two power units and ninety containers. The capital cost for the container equipment was $380,000. For similar trailer equipment the cost would have been $850,000. The licensing cost was reduced by two-thirds.[11]

Revenue. Because of their numerous advantages, containers can contribute substantially to the revenues of carriers. For example, on the New York Central System the average gross revenue of a boxcar is just over $400 a month. A Flexi-Van container (the name of the container system) results in a monthly gross revenue of almost $4,000. Further, on the New York Central an average boxcar is empty forty-three per cent of its total mileage while a van-type container is empty only nine per cent of its mileage. While Flexi-Van containers comprise less than one-half of one per cent of New York Central's total equipment, they are contributing fifteen per cent of the Company's total revenue.[12]

Mileage. The Canadian Pacific is transporting its containers an average of 400 miles a day. Its boxcar average approximates forty miles a day.[13]

Loss, Damage, Spoilage and Contamination. Compact loading of containers and reduced handling of freight contents results in less loss, damage, spoilage and contamination of goods. Officials of the New York Central System have stated that loss and damage with containers is at its lowest level in history.[14] In 1966 the United States Department of Agriculture shipped a container of grapefruit from Florida to Switzerland. Spoilage was one per cent compared with the normal spoilage of fifteen per cent.[15]

Shippers' Costs. One study published by the New York Central indicates that substantial savings can accrue to shippers from the use of containers. Appendix XXX compares the cost of twelve trailer loads of private carriage from Boston to Chicago, and St. Louis, with the use of twelve containers. The cost reduction for the shipper was just under $2,000 a week, or almost $103,000 a year. With this technological change, the road-haul is now undertaken by the railway, leaving the short hauls to the road vehicle.

Containers and Trucking Operations

From certain points of view, containers will unquestionably enable greater savings for the railways than for the trucking operations. For example, reduced loss and damage is one of the features that trucking has offered to shippers in the past. Nevertheless, to a greater or lesser degree, the use of containers in trucking operations will evidence the advantages listed.

As the use of the standard container is extended there will be a closer bond between trucking companies, the railways, ships and aeroplanes. At this point some trucking companies are not enthusiastic about van-type containers. Gill Interprovincial Lines has standard trucks, each with a four-wheel trailer attached. The General Manager claims this latter vehicle is his container. While it serves that Company's purpose, as it is in long-distance, extra-provincial road transport, in actual fact, such trailers are more costly than van-type containers.

Cargo Cages

A further development in the container field is that of the cargo cage. Appendix XXXI briefly outlines information on the cargo cage, an innovation about which the Canadian Pacific Railway Company officials are optimistic. It will be noted that in tests made, cargo cages increased motor carrier efficiency in the United States by 200 per cent for handling shipments under 200 pounds, and by fifteen per cent for all shipments under 10,000 pounds.

As will be noted from Appendix XXXI, cargo cages were originally designed by the American Trucking Associations, Inc. The main purpose of the cage is for "batch handling" of small shipments. These cages carry up to three hundred pounds and, according to Mr. John M. Akers, Chairman of the American Trucking Associations, sixty-four per cent of all trucking shipments in the United States

weigh less than three hundred pounds.[16] Thus, the cages, which have various advantages in handling and protecting shipments, would seem to hold out considerable opportunity as an aid to trucking in "batch handling."

Container and Cargo Cage Traffic

Primarily the traffic which is carried in containers is that of processed and fully manufactured goods. Examination of for-hire and private intercity motor truck traffic, as shown in Chapter II, would indicate that probably fifty-two per cent of the material handled could possibly be transported in containers or in the smaller cargo cage. However, there is a large investment in standard truck and trailer equipment and there are limitations on the use of containers in various types of operations. This is especially so in those situations where only one or two vehicles are required. Thus, in the immediate future, the real potential of transport by container would seem to be less than the fifty-two per cent of processed and manufactured traffic carried by trucks. The greatest possibility seems to lie in the area of larger fleets of common and private carriers where containers can be deposited for loading or unloading while the power units are released for handling other containers.

The railways envisage a bright future for their container operations, especially for express and L.C.L. freight or small shipments. There is a close integration of road and rail vehicles.

In 1965 Canadian Pacific Express handled 10,000 container loadings. According to Mr. D.W. Francis of Canadian Pacific, container loadings in Canada increased 200 per cent in 1965. It was estimated they would have increased 300 per cent in 1966 and will increase 400 per cent in 1967.[17] At present container growth is greater than any other type of transportation tool.[18]

Apparently some in Canada hold the opinion that containerization is not progressing as quickly as it could. This is especially so in relation to imports and exports by containers through port facilities. The Department of Transport held a seminar in the early summer of 1967, and plans to again hold another one later in the year to consider the whole matter.

The Department of Trade and Commerce is having a study made of the possible freight which may be shipped by containers. This is especially aimed at ascertaining what port facilities should be made available for container operations.

Long-Term Future of Containers

In 1964 General Motors' futuramic display at the World's Fair in New York, envisaged an extensive transportation system built around computer-controlled, specially-designed containers stored in open-bay terminals. They will be able to carry raw materials and

finished goods, including liquids. It will be possible to transfer the containers freely from one mode of transport to another. Envisaged were electronically-controlled highways, high-speed railway trains, vertical take-off planes, all-weather barge ship canals and cross-country conveyor belts. Shown was a prototype of a futuristic truck, referred to as "The Bison." Planned for the truck was a 280 horsepower gas turbine engine, with 720 additional horsepower for extra acceleration.[19]

Summary

It would seem that there are bright prospects for the use of containers, more so in the long-term future. Nevertheless, there will be some immediate growth. By the utilization of standard containers it would seem there will be a greater integration of the different modes of transport and possible economies in transportation costs. Even where integration does not take place, containers can undoubtedly reduce the costs of trucking operations.

CONCLUSIONS

Both piggyback and containerization would seem to have future growth potential. They are, however, primarily both vying for the same traffic. The drawback of piggyback as compared with containerization is the additional or excess weight to be carried and the larger investment in trailer equipment. One major drawback of containerization could be standardization but there would now seem

to be much more opportunity for container growth than was evidenced in the Carr report. Trucking operations have a large investment in present equipment - both power units and trailers. This could be a deterrent to the growth of containerization, especially in the immediate years ahead.

For both of these traffic arrangements, processed and manufactured goods would seem to be the potential freight. As mentioned, this type of traffic comprised fifty-two per cent of road freight but, as was concluded earlier, the real potential would be somewhat below this because of small operations and other similar situations.

The major result of piggyback and containerization would seem to be an integration or a fitting together of road and rail transport. These technological arrangements allow each mode to operate where it can best do so. However, piggyback and containerization would seem to gain more for rail transport than for road transport, although the latter can benefit.

Referring to Chapter III, on transportation demand, it would appear that these two innovations are, and will be, effective in the high-valued commodity transportation market. With the passage of time, rail transport will probably show an increased demand for service because of piggyback and containers. Road transport will probably find these innovations facilitate its operations to a greater extent. If over-the-road costs become burdensome, e.g., an excessive increase in labour costs, motor carriers will probably tend to use

piggyback and containers more and more. However, union agreements could have an inhibiting effect.

The chapter which follows deals with other technological matters which are affecting, and will affect, road transport.

FOOTNOTES FOR CHAPTER VII

1 Piggyback service is provided by Pacific Great Eastern Railway in British Columbia, and also by some other small roads in Canada.

2 For example, the collective agreement of the Teamsters' Union with Smith Transport, Ltd., in Quebec.

3 Maritime Truck Transport Review, Op. cit., April 19, 1965, pp. 18-19.

In 1964 an extensive display was arranged by General Motors for the World's Fair in New York. Containerization was the main feature for the handling of freight in the future.

4 D.W. Francis, "Containerization in Canada from a Canadian Pacific Viewpoint," Speech to the National Piggyback Association, Montreal, July 20, 1966, p. 4.

5 Information obtained from the Director of Flexi-Van Sales and Service, New York Central System, New York, N.Y., July, 1966.

6 Maritime Truck Transport Review, Op. cit., April 19, 1965, p. 18.

7 A new type of container, referred to as "Railtainer", built by Steadman Industries, Limited, Rexdale, Ontario.

8 "Integrated Container Systems," Material Handling in Canada (Toronto: Maclean-Hunter Publishing Company, Limited), May, 1966, p. 22.

9 D.W. Francis, Op. cit., p. 13.

10 Ibid.

11 Ibid., p. 14.

12 "Containerization Trend Going Up and Up," The Financial Post, Op. cit., May 28, 1966, p. 17.

13 Ibid., "Containers are Revolutionizing our Ports," June 10, 1967, p. 25.

14 Ibid., "Containerization Trend Going Up and Up," May 28, 1966, p. 17.

15 Ibid.

16 John M. Akers, Chairman of the Board, American Trucking Associations, Inc., "Highway Transport in 1970," Speech to the National Shipper/Carrier Conference, Montreal, February 25, 1965, Canadian Transportation (Toronto: Maclean-Hunter Publishing Company, Limited), April, 1965, p. 34.

17 D.W. Francis, Op. cit., pp. 3 and 4.

18 Ibid., p. 4.

19 For a more detailed description see article listed under Footnote 3 above.

CHAPTER VIII

TECHNOLOGICAL AND OTHER IMPORTANT CHANGES - PART II

INTRODUCTION

The further important changes taking place which will affect road transport are the acquisition of trucking companies by the major railways, integration of air and road transport, bulk hauling, road and shed handling equipment advances, improved highways, extra-provincial licenses, computer use and training. These matters will be commented upon in the order shown.

RAILWAY ACQUISITION OF TRUCKING COMPANIES

Introduction

In the 1946-1948 period, the Canadian Pacific Railway Company recognized the need to acquire truck lines if it was going to be able to compete fully with highway trucking competitors. A diversification of railway services was necessary if the railway was to survive as a viable entity. Otherwise it was felt that at best the railways would become the "hewers of wood and drawers of water" in the transportation complex, i.e., they would be transporting only the low-valued, bulk commodities on which the rates were minimum. This was the trend for railway operations prior to the extension of competitive pricing and re-alignment of operational procedures.

Various organizations and bodies appearing before the Turgeon and MacPherson Royal Commissions suggested that railway ownership of trucking companies should be restricted to lines which were complementary or supplementary to railway services.[1] Apparently their position was that the use of trucks should be restricted to carrying goods which have been or would be moved by rail. In the intervening period between the two Royal Commissions referred to above, the railways acquired a number of trucking companies.

The major reason for opposition to railway ownership of truck lines was that competition would eventually be stifled because road operations would be owned to a considerable extent by the railways. Neither of the Royal Commissions saw fit to recommend that there be a restriction placed on railway acquisition of trucking companies. The Turgeon Commission felt that if competition were stifled it could be dealt with when the occasion arose. The MacPherson Commission stated in part: "...the experience of other countries with such restrictions does not encourage us to recommend it in Canada..."[2] Presumably this reference was made to Britain and the United States, where restrictions were in effect. It did recommend that there be separate accounting records maintained for the railways' rail operations and their highway operations so that proper costing could be pursued.[3]

In 1963 the Canadian Trucking Associations advanced five comments[4] to the Cabinet Committee on Transportation concerning the

MacPherson Royal Commission's findings. The tenor of the remarks made was that the Royal Commission had under-estimated the situation and that there was a greater threat to the trucking industry than would seem to be envisaged by the Royal Commission. Again in 1965 the Trucking Associations made strong representation to the Standing Committee on Railways, Canals and Telegraphs on the subject of truck line acquisition by the railways.[5] The contention was that Government policy had not been enunciated on the subject. Again in November 1966, during hearings of the Standing Committee on Bill C-231, the Trucking Associations brought up the subject of railway acquisition of trucking lines.

The Government included a section in the National Transportation Act which requires that any transportation undertaking, to which the jurisdiction of Parliament applies, must notify the Canadian Transport Commission of its intent to acquire, directly or indirectly, an interest in any other transport operation, by purchase, lease, merger, consolidation or by any other method. The Commission must give public notice of such intent and inform the Director of Investigation and Research under the Combines Investigation Act. If there is objection by outside parties, the Commission must hold an investigation and may disallow any such acquisition which will be unduly restrictive of competition or will be prejudicial to the public interest.[6]

Railway Trucking Acquisitions

As mentioned, in the late 1940's the Canadian Pacific made a number of acquisitions and owned truck lines throughout the four Western Provinces. Later the Canadian Pacific Merchandise Services was established in British Columbia, with extensions thereafter, to integrate express, freight and truck transportation. The trucking subsidiary of Canadian Pacific in Western Canada is Canadian Pacific Transport, Limited. The main principle of the integration was to use truck transportation to supplement rail transportation or to be substituted therefor. The objective was to use the most efficient method.

In 1957 Canadian Pacific extended its trucking operations from coast to coast with the acquisition of Smith Transport, Limited, in Eastern Canada. In 1965 Canadian Pacific acquired Fred C. Loucks Trucking Company, operating in the interior of British Columbia, Alberta and the Yukon Territory.

In the 1950's, especially during the latter years, the Canadian National began to acquire truck lines across Canada. It now operates trucking lines from coast to coast.[7] A more recent purchase was Chapman Freight Lines, Ltd., in Southern British Columbia, in the Fall of 1966. This Company is based in Kelowna and provides transportation in the Okanagan Valley and to the Pacific Coast.[8]

To date the railways have purchased at least twenty-five truck lines, some of which have been absorbed into Canadian Pacific

Transport, Limited, while others have been absorbed into Canadian National Transportation, Limited.[9] Still other companies have retained their own identity.

Railway Trucking Data

While it is difficult to obtain information on railway trucking companies, it was possible to glean some for the year 1963. Unfortunately it cannot be obtained for later years. Further, because of the confidential requirements, it is not possible to divulge the information in too detailed a manner. Table IV below shows the magnitude of railway trucking for 1963 as compared with the total for-hire common and contract carriers included in the report of the Dominion Bureau of Statistics.

TABLE IV

DATA RELATING TO CLASS I, II, III AND IV FOR-HIRE TRUCKING COMPANIES AND ELEVEN RAILWAY TRUCKING COMPANIES, CANADA, 1963

	Total Reported Canada		Railway Trucking Companies		Per Cent of Total
Number of Firms		4,764		11	0.23
Total Assets - Millions		$319.2		$45.2	14.1
Total Operating Revenues - Millions		$524.4		$61.1	11.6
Total Operating Expenses - Millions		$490.3		$60.2	12.3
Net Operating Revenues - Millions		$34.1		$0.9	2.6
Operating Ratio		93.5		98.5	-
Equipment:					
Tractors	13,559		1,556		
Trucks	15,365	28,924	687	2,243	7.8
Trailers					
Semi	19,750		3,578		
Full	2,240	21,990	-	3,578	16.3

NOTE: See Footnote 10 for detailed information.

SOURCE: D.B.S., Transportation and Public Utilities Division; D.B.S., Motor Carriers - Freight, Part I and Part II, 1963.

The above table reveals that while railway trucking companies comprise about one-quarter of one per cent of the total companies reporting, they accounted for 14.1 per cent of total assets and 11.6

per cent of operating revenues. This indicates that the railway trucking operations are relatively large entities. For that matter the two large Canadian Pacific trucking companies are amongst the largest in Canada. Smith Transport, Limited, earns substantially more revenue than any other single Canadian trucking company and Canadian Pacific Transport is probably equalled by only one or two other trucking firms, one of which would be Maislin Brothers Transport, Ltd., in Eastern Canada.

Examination of equipment data reveals that railway trucking companies accounted for only 7.8 per cent of the total trucks and tractors but owned 16.3 per cent of the total trailers. This difference in proportions could indicate an extensive use of piggyback, which reduces the number of power units required but necessitates a larger number of trailers.

Reference to the operating ratios reveals that the railway trucking figure was much higher than that shown for all companies reporting. Various factors could be involved. For example, some of the matters to be considered are, the type of commodity handled, the product mix, the utilization of equipment, financing, the particular area in which the operation is located, the competition involved, and the utilization of piggyback. This subject will be examined more fully in the next chapter.

The Carr report claimed that in many instances piggyback was more expensive than over-the-road trucking. This may be a factor.

However, in earlier years, the Canadian Pacific apparently signed an agreed charge according Canadian Pacific Transport, Ltd., a very low rate for trailer shipments.[11] In this particular case probably piggyback charges would be lower than over-the-road trucking costs and thus it would reduce the operating ratio.

There is one further interesting observation which concerns net operating revenue per ton carried. While annual tonnage was not available for all railway trucking lines, it was for most. In Table V below the available averages for 1963 are shown in decending order.[12]

TABLE V

NET OPERATING REVENUE PER TON AND TOTAL NET ASSETS FOR TEN RAILWAY-OWNED TRUCKING COMPANIES, CANADA, 1963

Truck Line	Net Operating Revenue Per Ton	Total Net Assets
No. 1	$ 2.54	$ 149,221
No. 2	2.46	1,078,566
No. 3	1.16	3,650,285
No. 4	0.96	1,901,225
No. 5	0.92	867,370
No. 6	0.76	2,983,433
No. 7	0.45	769,275
No. 8	0.39	8,071,428
No. 9	- 0.49	596,716
No. 10	- 0.68	24,864,098

SOURCE: D.B.S., Transportation and Public Utilities Division.

The wide divergence in net operating revenue per ton would suggest that there are considerable differences in their situations.

It suggests variations in the operating efficiency of railway-owned trucking companies. A standardization of operations would seem to be required. This could result in more favourable operating revenues. It is further observed that within this heterogenous group of trucking companies there emerges no distinct pattern as concerning net revenue per ton and total assets.

The Effect of Railway Acquisitions on the Trucking Industry

It cannot be denied that the railways are impressed with the value of highway vehicles for freight movement, especially where trains lack the service advantage. The major effect of railway acquisition of trucking companies is to knit more closely rail and road transport. As a result, the railways have some control over one of their major competitors - road transport. There is probably no appreciable change in road transport tonnage.

To what extent a monopoly situation exists, is difficult to determine. For their number, the railway trucking companies form a significant part of the total motor carrier industry. It would seem that the Government has been prudent to include in the National Transportation Act the provision mentioned earlier relating to acquisition of transport companies.[13] Careful consideration can now be given to any proposed acquisitions.

With a gradual whittling away of competitive forces it could be that the independent trucking industry would arrive at a

position where it was not able to provide vigorous competition. With sufficient purchase of truck lines, the railways could be in the monopoly position they held before the trucking industry became a strong competitor. One point which should not be overlooked, however, is that each trucking entity, whether it be railway-owned or independent, is responsible for a profitable operation, which in turn provides competition.

INTEGRATION OF AIR AND ROAD TRANSPORT

Air Traffic Growth

With each passing year movement of freight by air increases, although in Canada the ton miles performed by aeroplane are still relatively small in number. Yet in Appendix IV, sheet two, it is observed that air freight net ton miles increased from 8.0 million in 1950 to 75.0 million by 1965. Business firms are increasingly using air transport for rapid delivery of inventory material where formerly slower methods of transport were used. This necessitated the stockpiling of material in warehouses. With the elimination of a large portion of warehousing costs, savings can be achieved. In many instances these are greater than air freight costs. Anthony Rickards, in a study of air freight potential in the United States, indicates there is a very large growth possibility for air freight. One instance cited by him is the use of air transport by the Renault Automobile Company. It moves automobile parts from France to the United States

on short scheduling, eliminating large, costly warehouses.[14] In Canada, among other items, automobile parts are flown from Ontario centres, such as Oshawa, to Vancouver.

The Role of Road Transport

The potential for air freight traffic would seem to lie in the long-distance, high-valued manufactured goods now carried by rail and by road. Especially vulnerable is L.C.L., express and L.T.L. traffic. While the large extra-provincial truck lines will not be enthusiastic about the prospects of air freight expansion, as undoubtedly traffic will be lost to air transport, there would seem to be a place for coordination of air transport in the long-haul field and road transport in the short-haul field. An excellent opportunity exists for short-haul trucking operators to form an alliance with air operators for moving traffic to and from airports to short-haul destinations.[15]

Until recent years, valuable and/or urgently required materials, such as drugs, jewellery, perishable products, items too large or too awkward to be taken as personal baggage on aeroplanes, and freight to be transported to remote locations were the main items carried by air freight. As air rates have been reduced, gradually the aeroplane is replacing the warehouse and enlarging the scope of air operations. For example, a Montreal garment manufacturing firm may desire to ship to a retail outlet in Chilliwack, British Columbia. In a few hours the shipment can be transported by aeroplane from

Montreal to Vancouver. It may then be transported by a short-haul trucking operator from Vancouver to Chilliwack in approximately two hours. The retail merchant can thus guage his purchases and schedule his buying to seasonal demand. It enables the merchant to limit the amount he is required to invest in inventory. This is one essential factor in successful financing.

The motor carrier has thus become an important link in a relatively new method of product distribution, which will unquestionably grow in volume with the advancement of the jet-age.

Various possibilities exist for the motor carrier. Joint rate arrangements with airlines provides considerable opportunity, as does the use of standard containers, cargo cages and pallets for shipment use. For example, specially-designed containers are used for household goods in national and international service.

Probably the greatest increase in air traffic involves the common everyday items such as shoes, wearing apparel, tractor and machinery parts, foodstuffs and similar items.[16] While in the long-haul field trucks will lose traffic due to expanded air cargo service, the truck operating in the short-haul field stands to gain tonnage if such operators take proper steps to seize the opportunity.

BULK HAULING

Extent of Bulk Hauling

Motor carriers have been able to pierce the bulk-hauling

market in a very extensive way. While bulk hauling is an old method of transport, the outstanding feature today is the diversification of the products which are handled. In the United States, over 700 types of liquid and dry bulk commodities are being shipped by truck, while in Eastern Canada at least 300 types of these products are shipped in this manner.[17] The amount of bulk hauling in Western Canada is not comparable to that in the East, but there appears to be considerable enthusiasm for this type of transport and excellent prospects for its growth.

Bulk carriers are transporting a wide variety of fuels, minerals, chemicals, foodstuffs, plastics, liquified gases, powders, pulverants and granulars.

Technology of Bulk Hauling

The corrosive nature of some chemicals and the need for minimum contamination of chemicals and food products, have spurred technical development in tank truck construction, linings in tanks, discharge methods, tank cleaning procedures and temperature control.

A wide variety of vehicles are used for carrying both dry and liquid products. One of the main objectives in the construction of these vehicles has been versatility, i.e., carrying a full load in both directions. H.M. Trimble and Sons, Limited, which operates in Alberta and British Columbia, is a pioneer amongst bulk carriers in Western Canada. Trimble uses various types of vehicles for bulk

transport in order to have a full load on the return trip, two-way utilization being an important factor. One type of aluminum, flat-top, tank semi-trailer used, allows the carrying of a liquid in the 5,800 gallon flat-top tank in one direction and the loading of dry materials such as plywood and lumber on the top of the tanker for the return trip. The dry weight capacity is 44,000 pounds.[18] Another Trimble dual-haul arrangement is the transportation of copper concentrates from Alberta to the Pacific Coast for Bethlehem Copper Corporation. The return trip involves petroleum products for Imperial Oil, Limited.[19] Because of technological arrangements it is possible to clean the trailer tanks very quickly.

Future of Bulk Hauling

Bulk-haul operations provide various advantages in the handling of materials. The major ones are the moving of products from origin to destination without containers, without loss and without contamination. This results in decreased handling costs. The executives in the field state, however, that railway operations in bulk hauling provide a very competitive market, especially with the use of competitive rates and the existing railway economic advantage. Nevertheless, they state that motor carrier bulk-haul operations are expanding. Even the railways themselves recognize the value of trucks for bulk hauling. The Canadian Pacific purchased large cement-hauling trucks to transport cement for the power project work presently

underway in Southern British Columbia.

Technological changes in the handling of commodities will aid the industry to grow. While data is not available, it appears that both liquid and dry bulk commodities transported by truck have a bright future as new products are being continually added. While manufacturing and market limitations may be curtailing factors in Canada, the wide range of products carried in the United States by bulk carriers would indicate the broad field for expansion of Canadian motor carrier bulk operations. With the use of bulk equipment, the avenues are opened for truck transport to compete more effectively with the railways in a traffic area which traditionally has been considered a railway stronghold. Included would be such commodities as animal products, i.e., oils and fats, products of mines and some forest products.

Referring back to Chapter III, it would seem that bulk-hauling facilities will enable road transport to extend its operations further into the intermediate- and long-haul markets of some higher-valued goods and probably extend further into the intermediate-haul market for some lower-valued goods.

POWER EQUIPMENT

Diesel Use

While traditionally the gasoline motor has been the power unit used in trucks, the diesel motor has become more widely used in

recent years. There presently exists varying opinions on the value of gasoline and diesel engines in lighter-weight trucks (below 26,000 pounds gross vehicle weight) and used in shorter-mileage trips (approximately less than 30,000 miles a year). The diesel engine has been used for some time in large transport trucks. No one disputes that there are economies to be achieved by the use of diesel, especially where there are heavy weights and long distances involved. With the passage of time, diesel engines are, however, being used to a greater extent in the medium-to-small size trucks.

Some proponents of the diesel engine claim that the gasoline engine is obsolete while others in the automotive field (representatives of the General Motors Corporation, for example) state that a gasoline-powered engine is most economical up to a certain mileage (see Appendix XXXII).

According to the proponents of the diesel engine, the first possible saving is that of fuel as more energy is obtained per gallon. Second, the diesel motor has a longer life than the gasoline motor. Third, there are reduced maintenance costs with the diesel as there is no spark ignition system and there is direct injection of fuel into the cylinders. It is estimated that eighty per cent of the troubles of a light gasoline truck stem from the complicated carburetion and ignition.[20]

Appendix XXXII outlines a partial cost comparison of a gasoline and a diesel truck. It is based on the first year of operation only. Maintenance is not shown but this would probably be

limited in the first year.

It is noted from the comparison that for a mileage of 50,000, the gasoline truck evidences an advantage of 0.57 cents a mile, or, say, $285 annually. For a mileage of 100,000 a year, the comparison indicates an advantage of 1.30 cents a mile, or $1,300 a year for the diesel. As pointed out, the longer life of the diesel motor and the reduced maintenance costs would not be too evident in the first year. Therefore, it would seem that the diesel could show considerable additional savings over its total span of life even if a truck travels only 50,000 miles a year.

Examples of Diesel Use in Smaller Trucks

There are instances in the United States where fleet-type operations, using smaller trucks, have switched from gasoline engines to diesel engines, with attendant benefits. The Roberts Dairy of Omaha, Nebraska, whose three-cylinder Divco diesel trucks operate approximately 25,000 miles a year, have about 160 to 170 engine starts each day.[21] After two years, it has been found that the diesels are saving approximately $670 a year per unit when compared with their similar gasoline units. In addition, the diesels are more dependable for starting.[22]

In May 1961, Smithfield Packing Company of Smithfield, Virginia, installed a diesel engine in a 25,000 pound gross vehicle weight truck. Annual fuel savings are totalling $1,500 to $1,600 a

year. After 220,000 miles the engine was overhauled at the low cost of $525 and at the beginning of 1965, the engine had performed for a grand total of 260,000 miles.[23]

Meadow Petroleum, Inc., of Rockway, New Jersey, converted eight oil delivery trucks from gasoline to diesel motors. By 1966 the owners of the Company stated that the diesels were exceeding their expectations. They were more economical to operate and to maintain, and were able to carry heavier loads than expected. It was also stated that the diesel engines are more reliable than gasoline engines, especially on damp, cold days when gasoline trucks tend to have ignition trouble.[24]

Diesel Units in Canada

Appendix XXXIII, sheet one, indicates that in 1964 only 1.3 per cent of the 1,033,000 trucks surveyed in Canada were diesels. For-hire trucks comprised 0.8 per cent of the total trucks. While the distribution of diesel trucks by weight is not available, the distribution of diesel fuel used by weight of truck is. Sheet one of this same Appendix also shows that of the total 129.2 million gallons of diesel fuel consumed, 98.6 per cent was used by trucks with a gross vehicle weight of 30,001 pounds or more. Thus only 1.4 per cent was used by trucks of 30,000 pounds or less.

Overall use of diesel trucks has increased since 1957. While the total number of diesel trucks for 1957 is not available,

information on diesel fuel is. Appendix XXXIII, sheet two, shows that of the total 603.0 million gallons of motor fuel used in Canada during 1957, 37.0 million or 6.1 per cent was diesel fuel. In 1964 a total of 879.4 million gallons of fuel was used, of which diesel fuel comprised 129.2 million gallons, or 14.7 per cent. This was an increase of 8.6 percentage points in the total proportion. The absolute increase in diesel fuel used indicated an almost 250 per cent increase from 1957 to 1964.

In summary, the use of diesel trucks is increasing but there would appear to be a considerable opportunity for expansion of the use of diesel engines in Canada for both small and large trucks, with accompanying economies in operation. While the initial capital outlay may be greater than for gasoline motors, the diesel would seem to be one avenue whereby trucking operators can combat increasing costs, especially with more advanced types of diesel engines.[25]

Gas Turbine Trucks

The development of gas turbine engines may supersede the diesel engine in the larger truck. The Ford Motor Company recently tested an experimental gas turbine truck which travelled across the United States. The 600 horsepower gas turbine engine is capable of pulling loads up to the legal limit - up to 130,000 pounds in some states on turnpikes and toll roads - at a legal seventy miles per hour. (On most normal highways the range approximates 70,000 to

80,000 pounds, similar to Canadian roads).

The experimental Ford truck has aerodynamic design, which the Company claims enables a thirty-seven per cent efficiency increase over traditional design and which results in important fuel savings. The truck can carry sufficient fuel for 600 miles or more and included in the cab are kitchen, lavatory, writing, television and eating facilities. In addition, the cab is air-conditioned and the co-driver's seat can be put into a reclining or horizontal position for resting.

The turbine engine is similar to a jet engine in an aeroplane but with adaptations to transfer the power to the wheels of the truck. It is only one-third of the weight of comparable diesel engines. The major advantages claimed by the Ford Motor Company are the excellent torque characteristics, which enable lighter transmissions, no liquid cooling system, no contamination or consumption of lubricating oil, longer life between major overhauls, a low level of noise and vibration, clean, odorless exhaust, ability to burn a wide range of fuels, excellent starting in cold weather and quick engine replacement.[26] One of the problems in the past has been the necessity to obtain a type of metal for the motor which can stand the intense heat that is generated.

Chevrolet Division of General Motors Corporation, has a similar truck under test. It is expected that its normal service life will be 350,000 miles and will probably be in production by about 1970.[27]

While large-scale production of gas turbine trucks may possibly be two or three years away (depending on the particular company), when these trucks are available they will undoubtedly have an impact on the sales of large diesel trucks. One drawback to full utilization would be a rigid application of a forty-hour, five-day work week (as dealt with in Chapter VI). This type of regulation could be a considerable deterrent to the acquisition of such equipment by trucking operations.

OTHER MATTERS

Roads

The improvement of highways will aid the expansion of trucking and enable cost reduction as longer and heavier loads are allowed. At present 74,000 pounds is the maximum gross vehicle weight allowed in most provinces, while British Columbia allows 76,000 pounds on certain designated roads. The overall length of combination units is confined to sixty feet in most cases, but one or two provinces allow greater lengths.[28] In certain Canadian provinces and on certain highways in the United States, trailer trains of three vehicles may be operated in a combination. On certain United States turnpike and toll roads overall lengths can range from ninety-eight to 108 feet. With improved highways, "thruways", and cross-country road facilities, Canadian authorities will probably extend the length and weight limits on the more advanced roads. This

should aid trucking operators considerably.

Road construction and maintenance is costing all levels of Canadian government large sums of money. Total road expenditures were estimated at over $14.0 billion from 1949 to 1965. (See Appendix XI).

Reciprocity

Until recent years extra-provincial trucking operators were required to buy a license for each province through which their trucks travelled. As reciprocity agreements have been signed between the various provinces, and are still under negotiation in some instances, e.g., Quebec with other provinces, licensing costs have and are being reduced. Various arrangements exist. For example, between Alberta and Ontario private operations have full free reciprocity, and for-hire operations pay $10 a gross ton, except for those vehicles with a gross weight of 6,000 pounds or less, or those transporting natural products of the farm, forest, sea, lake or river, or those transporting art objects or household goods. A number of provinces assess the for-hire carriers $10 a gross ton.

Computers

Another change which is taking place in the trucking industry is the greater use of computers. Computer manufacturing companies have been constructing machines suitable for trucking operations. Some of the more progressive intercity for-hire carriers are now using computers to considerable advantage for accounting, billing and management control purposes.

Shed-Handling Equipment

Advances have been made in shed-handling equipment. Fork-lift trucks in conjunction with palletized loading are aiding motor carriers in shed-handling procedures. The use of conveyor belts have also been advantageously introduced in some larger operations.

Training and Education

The trucking industry has become much more aware of one other important area. This concerns management and employee training. Management has begun to realize that survival in a competitive industry requires more extensive training procedures than that of driver and safety programming. Not that these two subjects can be overlooked. However, training and education of the industry's employees has been neglected, with important consequences. The need for training of all types of employees, from dock workers to management, has been recognized by more forward-looking executives who are planning for massive training programmes.[29] The following comment was made by Mr. Marsh Davis, President, Inter-City Truck Lines, Ltd., Ontario:

> ...Trucking executives now recognize the necessity of a training program for all our personnel...[30]

Because of the atomistic nature of the industry and fairly easy entry in the past, the need for training did not seem to be

realized heretofore. With increased competition and large staff turnover, the need for advanced methods of business operation is a necessity. A better understanding is required of marketing, personnel, freight handling, planning and financial techniques, as well as an understanding of the principles and forces at work in the industry. In addition to the action being taken on the part of some trucking companies, organizations such as the Canadian Institute of Traffic and Transportation and Canadian Industrial Traffic League are aiding as much as possible by sponsoring training courses in traffic management so that better trained candidates will be available.

The tremendous need for more and more planning on the part of managers is becoming much more evident with technological advances. Increased technology requires heavy expenditures, a greater dependence of one company department on another, one company on another, one area on another. The interrelationships of business have become complex, with transportation and distribution factors being deeply involved and extremely important in the overall picture.

Further, management today must spend less time at the detailed operation, with more attention being paid to business, government and community relationships. The small operator of former days now finds himself unable to handle a host of diverse problems, which is probably one of the main factors encouraging the sale of smaller operations to larger ones, or at least the merger of the

smaller entities, a subject referred to in the next chapter.

The larger entities are generally more able to train or hire specialists, who are familiar with not only accounting but mathematics, economics, social and psychological problems, engineering and even cybernetics, i.e., the comparative study of the control system formed by the nervous system and brain, and mechanical-electrical communication systems such as computers.

The need for broad education and management training is apparent to some of the more progressive trucking operations, a factor which will enable them to compete more effectively.

CONCLUSIONS

The main purpose of Chapters VII and VIII is to indicate important changes taking place in respect of trucking. Some changes will alter service demand patterns, others will decrease costs or enable a more efficient operation, which should in turn decrease costs.

One may conclude that the profile of the industry will be changed in the next few years. To some degree trucking has been and will become more integrated with other modes of transport by piggyback, fishyback, containerization, railway acquisition of truck lines, and cooperation between air transport and road transport on higher-valued merchandise. This blending of modes of transport generally has the value of using each mode in its most advantageous role.

If there is advantage to be gained by blending, then care must be exercised that monopoly situations do not exist to the detriment of the nation. Competition between the two methods of operation, i.e., a blending, or on the other hand, independent operation of each mode, should sort out the most efficient procedure. In this whole area, the best role for governmental regulation would seem to be to endeavour to have the element of competition available in a form sufficiently potent to curtail monopoly positions. If this cannot be achieved then direct monopoly regulation would appear to be a necessity.

For the good of the nation, it would seem that it is vitally necessary for the trucking industry to be competitively strong. The factors mentioned in this chapter, such as improved bulk-hauling equipment, better power and trailer equipment, improved roads, extended reciprocity, improved shed equipment, better management techniques, and more training and education for members of the trucking industry, will all aid to reduce costs or result in a more efficient operation. This should aid the industry to compete more vigorously.

The chapter which follows examines the financial situation of for-hire carriers.

FOOTNOTES FOR CHAPTER VIII

1 Report of the Royal Commission on Transportation, February 9, 1951 (Turgeon Royal Commission), Op. cit., p. 153;

and

Report of the Royal Commission on Transportation, 1961 (MacPherson Royal Commission), Op. cit., Volume II, p. 82.

2 Ibid., MacPherson Royal Commission, Volume II, p. 82.

3 Ibid.

4 The Canadian Trucking Associations, Inc., commented as follows:

a) It felt the Commission had underestimated the importance of the size of certain trucking operations and overestimated ease of entry into the trucking field. Thus it was considered that one of the "natural" anti-monopoly safeguards was weaker than the Commission thought.

b) It was stated that the Commission had relied on "private" trucking as an alternative. The Association felt that "private" trucking was actually open only to large shippers.

c) The Association said the Commission had concluded the implications of railway entry into the trucking industry on a massive scale was difficult and complex to assess. The Commission believed the trucking industry should be able to alert the public and Federal authorities in the case of restraint of trade. The trucking industry felt that this would be a more difficult task than anticipated.

d) The Commission had referred to the possibility of legislative or regulatory restraint. Because an institution was not existing for this purpose there was no possibility for such restraint. (Writer's note: The newly proposed Canadian Transport Commission could fulfil this requirement).

e) While the Commission had referred to the experience of other countries, the Association felt no systematic study existed and, thus, no reasons were given why the other countries had taken the position they had.

Submission to the Cabinet Committee on Transportation, Canadian Trucking Associations, Inc., February, 1963, Op. cit., pp. 5.2-5.3.

5 Submission to the Government of Canada on National Transportation Policy, Canadian Trucking Associations, Inc., January, 1965, Op. cit., p. 25.

6 The National Transportation Act, Op. cit., p. 13.

7 The trucking operations listed in the 1965 Annual Report of the Canadian National Railways were:

Canadian National Transportation, Limited.
(This Company includes trucking operations in various parts of Canada).
Eastern Transport, Limited.
Empire Freightways, Limited.
East-West Transport, Ltd.
Hoar Transport Company, Limited.
Husband Transport, Limited.
Midland Superior Express, Limited.
Scobie's Transport, Limited.
The Toronto-Peterborough Transport Company, Limited.

The Chapman Freight Lines, Ltd., was acquired in 1966. It is understood that this Company is to be incorporated into Canadian National Transportation, Limited.

8 "C.N. Buys B.C. Truck Line," The Financial Post, Op. cit., October 29, 1966, p. 27.

9 According to The Financial Post, by 1964 the railways had acquired twenty-two lines. (See issue of November 21, 1964, p. 15). Since then they have purchased at least three lines - East-West, Loucks, and Chapman. Over the years a number have been included in Canadian Pacific Transport, Limited, and Canadian National Transportation, Limited, accounting for only eleven companies being shown in Table IV.

10 a) As mentioned in Footnote 9, at least three companies have been acquired by the railways subsequent to the data shown in the table. From what can be ascertained, total revenues would not appear to be substantial when compared with aggregate revenues of 1963.

b) While there are possibly 13,000 for-hire common and contract companies, a very large number fall into Class IV, which includes trucking companies with annual revenues of less than $20,000. According to the Dominion Bureau of Statistics, the major trucking operations are included in Classes I and II, which comprise those with annual revenues of $100,000 or more. Of the large trucking operations, the Bureau states that one Company in Canada (Taggarts, Limited) does not report. In

view of the fact that excellent coverage is enjoyed for Classes I, II and III (all companies with annual revenues over $20,000), it is considered that well over ninety per cent of the revenue is included.

c) Not included in Table IV is data relating to 227 companies engaged in the moving and storage of household goods and 138 firms engaged primarily in warehousing. Both of these groups account for some trucking revenue, although the warehousing group earns a very limited amount.

11 This matter was advanced by the Canadian Trucking Associations, Inc., during hearings on Bills C-120 and C-231.

Under the National Transportation Act such a rate would have to be accorded to any highway operator who had the necessary road transport licenses.

12 D.B.S., Transportation and Public Utilities Division.

13 It was not included in Part III, and it was operative as soon as the Act was given Royal Assent.

14 Anthony K. Rickards, "The Role of Aviation in the Domestic Freight Transportation System of U.S." (unpublished Ph.D. thesis, McGill University, Montreal, May, 1963).

15 "Airfreight Up," Motor Carrier (Vancouver: Westrade Publications, Ltd.), December, 1964, p. 13.

16 Ibid., p. 15.

17 "Bulk May Double in Five Years," Bulk Motor Transport in Western Canada (Regina: Mercury Publications, Limited), Undated, p. 17.

18 Ibid., p. 4.

19 Motor Carrier, Op. cit., March, 1966, p. 13.

20 James F. Albrecht, "The Reasons For Going Diesel," Canadian Transportation (Toronto: Maclean-Hunter Publishing Company, Limited), February, 1965, p. 16.

21 Ibid. A city ordinance requires that engines be shut off at each stop.

22 Ibid.

23 Ibid.

24 Ibid.

25 Mr. Albrecht referred to a new type of diesel engine called the Detroit Diesel "N" Engine. This engine has a new type of fuel injector and a higher compression ratio than present engines. It can produce more horsepower without using any more fuel - referred to as power flexibility.

26 "Down the Road - Ford's Experimental Gas Turbine Truck" (Dearborn, Mich.: Ford Motor Company), Undated.

27 "Chev. Unveils Turbo Titan," Maritime Truck Transport Review, Op. cit., August, 1965, pp. 1 and 15.

28 D.B.S., The Motor Vehicle, Op. cit., Part I, 1964, p. 6.

29 R. Eric Gracey, General Manager, Canadian Institute of Traffic and Transportation, "What's Ahead in Transportation Management?" Speech at the 20th Annual Meeting of the American Society of Traffic and Transportation, Inc., University of California, Los Angeles, September 8, 1965, pp. 6-10.

30 Marsh Davis, "Marsh Davis Outlines Future of Trucking," Maritime Truck Transport Review (Moncton, N.B.: Maritime Motor Transport Association), August, 1965, p. 7.

Mr. Davis is President of Inter-City Truck Lines, Ltd., and also, at the time, he was President of the Automotive Transport Association of Ontario.

CHAPTER IX

FINANCIAL ASPECTS OF CANADIAN FOR-HIRE TRUCKING

INTRODUCTION

The following examination of financial information on motor carriers relates to the intercity for-hire group. As will be realized, financial data is not available for the other three classifications of trucks - private intercity, urban and farm trucks.

Revenue and balance sheet data are examined and some financial comparisons are undertaken. Comment is then made on the size of trucking companies, after which reference is made to leasing, followed by some discussion on for-hire trucking as compared with private trucking.

FINANCIAL DATA

Total Revenue

Table VI below indicates the relative freight revenue position of the for-hire road transport group as compared with the other modes of transport, both in Canada and in the United States. It will be noted that gas distribution systems are shown for Canada but not for the United States. Further, information regarding Canadian gas systems is not yet available for 1965. Therefore, the percentage distribution of revenue for Canada has been shown for 1964,

with gas included. So that some comparison may be made with the United States data, information for 1965 is shown for rail, road, air, water and oil pipelines for Canada and the United States.

TABLE VI

FREIGHT REVENUES RAIL, FOR-HIRE ROAD, AIR, WATER, OIL PIPELINES AND GAS PIPELINES, CANADA, 1964 AND 1965, AND THE UNITED STATES 1965

Mode of Transport	Canada				United States	
	1964		1965		1965	
	Millions	Per Cent	Millions	Per Cent	Millions	Per Cent
Rail	$1,179.3	38.5	$1,221.5	43.7	$ 9,293.2	44.1
Road	891.8	29.0	971.2	34.8	10,085.9	47.9
Gas Pipelines	440.8	14.3	-	-	-	-
Air	94.7	3.1	99.1	3.6	464.3	2.2
Water	324.5	10.6	353.3	12.7	307.8	1.5
Oil Pipelines	138.5	4.5	145.8	5.2	903.8	4.3
Total	$3,069.6	100.0	$2,790.9	100.0	$21,055.0	100.0

NOTE and SOURCE: See Footnote 1.

The above table indicates that in Canada the revenues of for-hire road carriers comprise 29.0 per cent of the total for the six modes of transport. This is a substantial contribution to the

nation's economy. In Chapter I it was indicated that in 1963 for-hire carriers produced 64.2 per cent of the total road net ton miles in Canada. Thus, if one could attach a dollar value of service to the 35.8 per cent of net ton miles produced by the other three classes of trucks, the total value of service produced by trucks would be increased by more than one-half. Assuming that revenue per net ton mile for the other three classes of trucks was equal to the net ton mile revenue for the for-hire group, extrapolation would produce a value of service of $1,389.1 million for 1964, exceeding the total freight revenue of the Canadian railways. Further, it could well be that the revenue or value of service per net ton mile for the smaller urban trucks would not only equal but probably exceed that of the large intercity for-hire carriers. In such event the total value-of-service figure shown above would be greater.

According to the American Trucking Associations, Inc., it is estimated that in 1965 the value of all motor carrier freight services in the United States would equal three times the $10.1 billion shown for for-hire carriers.[2]

The above table also reveals that the for-hire road carriers in the United States contributed 47.9 per cent of the total revenues in 1965. Excluding gas systems, the Canadian for-hire group contributed 34.8 per cent of the total revenues, 13.1 percentage points less than the United States carriers. Road transport freight revenues in the United States exceeded rail revenues in 1963, 1964 and 1965.[3]

Whether the Canadian for-hire motor carriers could obtain the proportion of revenues enjoyed by the United States for-hire carriers is difficult to determine. For various reasons they may not, at least for a number of years. For example, the Canadian winters are more severe, population is more widely dispersed in Canada, and distances between larger centres tend to be greater. All of these factors could inhibit the rise of Canadian motor carrier revenues to the proportionate level of those in the United States, but at least the difference indicates that there is a possibility for further proportionate growth in Canada.

Revenue of Intercity Carriers

Appendix XXXIV, sheets four to eight, shows revenue, balance sheet, ratio, and return on investment data for Canadian intercity motor carriers. Because of the fluctuation in carrier coverage from year to year, which is explained in Appendix XXXIV, sheets one to three, average revenue figures and percentage proportions have been used in comparing the data.

This Appendix reveals that peak coverage of carriers was reached in 1962, a reduction being experienced since that time. However, carriers earning $20,000 or more annually have continued to increase in number over the years. According to the Motor Carrier report of the Dominion Bureau of Statistics, part of the reduction of total carriers was the result of mergers and consolidations of trucking companies.

Average Revenue Per Carrier. Sheet four of Appendix XXXIV, indicates that average revenue per carrier in 1947 was $30,500. By 1965 this had increased to $158,000, or by 418.0 per cent. In the same period the Gross National Product expressed in current dollars increased 295.0 per cent.[4] From 1947 to 1965 average net operating revenue increased from $2,680 to $9,400, or by 248.0 per cent. Examination of the same data, on sheet five, for carriers earning $20,000 or more annually, reveals that average revenue per carrier in 1947 was $108,700. This increased to $344,000 by 1965, a 216.0 per cent increase, while average net operating revenue increased from $7,300 to $18,000, or an increase of 147.0 per cent. Thus the smaller carriers experienced a greater percentage increase than did larger carriers.

Operating Ratios. Appendix XXXIV, sheet six, indicates that the operating ratio (proportion of expense to revenue) for all carriers reporting in 1947 was 91.2, increasing to 94.0 by 1965. Carriers earning $20,000 or more annually, experienced a 93.3 ratio in 1947, and a 94.8 ratio in 1965, indicating that a larger proportion of operating revenues are required for larger carriers as a group than for smaller ones. This could reflect the presence of proportionately greater implicit costs for smaller carriers, a subject referred to later in this chapter. Both groups experienced an increase in the operating ratio but the ratio for the total group increased at a greater rate over the period than did the ratio for

the group earning $20,000 or more annually.

According to the American Trucking Associations, Inc., the operating ratio in 1965 was 94.7 for 3,865 Class I and Class II common carriers, under the jurisdiction of the Interstate Commerce Commission in the United States. The same ratio for 1947 was 94.9.[5] While the position of the Canadian carriers appears to be more favourable, it must be remembered that these Canadian carriers are much smaller than the American companies. As pointed out later, in commenting on company size, larger companies probably have relatively greater overhead costs and possibly less proportionate implicit costs.

Balance Sheet Data. Appendix XXXIV, sheet seven, shows balance sheet data for Canadian carriers earning $20,000 or more annually.[6] From 1958 (the first year balance sheet information was available) to 1965, total assets increased 117.3 per cent, from $200.3 million to $435.2 million.

A review of the assets reveals, among other things, two features of interest. First, from 1958 to 1964 the proportion of fixed assets decreased from 57.4 per cent of the total assets to 49.8 per cent, returning to 51.2 per cent by 1965. This decrease from 1958 could reflect an increase in purchased transportation, which includes piggyback and leasing (referred to shortly). This rise in 1965 indicates a greater proportion of owned assets. Second, the proportion of other assets, such as investments, increased from 7.7 per cent in 1958, to 17.7 per cent of the total by 1964. In 1965,

however, they had decreased to 14.9 per cent, probably reflecting the greater investment in fixed assets.

A review of the equipment obligations and long-term debt as a proportion of total liabilities and owners' equity shows an increase from 22.2 per cent in 1958 to 26.0 per cent in 1964. A slight reduction to 25.3 per cent was experienced in 1965. Owners' equity decreased slightly from 41.2 per cent in 1958 to 39.4 per cent of the total liabilities and owners' equity by 1965. Sheet eight indicates that in the same period return on owners' equity increased from 14.8 to 15.1 per cent.

Following is a comparison of the financial ratios of the Canadian carriers referred to above and 1,159 Class I and Class II carriers of general freight in the United States, which earned $200,000 or more annually.

TABLE VII

FINANCIAL RATIOS OF CANADIAN CARRIERS EARNING $20,000 OR MORE ANNUALLY, AND CLASS I AND CLASS II CARRIERS OF GENERAL FREIGHT IN THE UNITED STATES, 1965

Ratio	Canada	United States
Working Capital	1.00	1.23
Total Debt to Equity	1.45	1.27
Long-Term Debt to Equity	0.66	0.60
Revenue to Equity	4.06	5.16
Net Income to Equity	15.1%	15.8%
Net Income to Revenue	3.7%	3.1%
Cash Throw-Off to Long-Term Debt	69.6%	60.1%

SOURCE: D.B.S., Motor Carriers - Freight, Parts I and II, 1965; Moving and Storage, Household Goods, 1965; Arthur J. Bruen, Jr., "1966 Banker's Analysis of the Motor Carrier Industry for 1965," American Trucking Associations, Inc., Washington, D.C., Table 5.

The above table reveals that the working capital ratio of the Canadian carriers was $1.00 current assets to each $1.00 of current liabilities. This is an acceptable level in transportation, a service industry, where inventories are generally of small magnitude. The United States carriers evidenced a fairly good ratio of $1.23 current assets to each $1.00 of current liabilities.

The long-term debt to equity ratio reveals an almost similar situation for carriers in both Countries, but a slight advan-

tage in the Canadian situation - six cents more of debt for every dollar of equity. There would be a little better leverage. The leverage principle is that with fixed payments for senior securities such as bonds or preferred shares, any excess profits earned over normal earnings, will accrue to the owners of common shares, making it more attractive for the suppliers of risk capital. In the final analysis, it is management's ultimate goal to create as attractive a situation as possible for those who supply risk capital and who hold voting control. Thus the slightly lower equity amount for each dollar of debt in the Canadian situation provides a little greater leverage and could provide a slightly more attractive situation for the owners.

However, the return on the invested dollar shows a slightly better situation for the United States carriers than for those in Canada - 0.7 per cent greater. On the other hand, the net income to revenue in Canada is 0.6 per cent greater than in the United States. This could result from the existence of relatively greater implicit costs for the Canadian carriers.

Cash throw-off ratio is one which is becoming more important in the trucking industry. It is comprised of the sum of charges of a non-cash nature plus net income after taxes. Depreciation is the main non-cash charge to be encountered in the trucking industry. Cash throw-off is the prime source of money for payment of long-term obligations. Thus, it is vital to the industry. Its significance

is to allow one to determine how long would be required to extinguish the long-term debt if gross cash throw-off were used solely for this purpose. Table VII indicates a cash throw-off of 69.6 per cent for the Canadian companies, which means that long-term debt could be paid off within a little less than a year and one-half. The United States time period would be about one and two-thirds years.

According to the 1966 Banker's Analysis of the motor carrier industry in the United States, the financial position of the carriers involved was very favourable.[7] From the comparisons made it may be concluded that the Canadian financial data compare favourably.

Ratio Comparison of the Various Modes of Transport

The comparison of revenues at the beginning of this chapter relates to freight revenues. In order to make some ratio comparisons between the various modes of Canadian transport, Table VIII below shows data relating to overall operations. Supporting revenue and expense data are contained in Appendix XXXV, sheet two. Capital information has been extracted from the D.B.S. reports listed on sheet two. Here again 1964 data is used as balance sheet data for air transport and gas pipelines is not yet available for 1965. Where available, 1965 data are included. It will be noted that generally there has not been a significant change from 1964. Included are data on motor carriers earning $20,000 or more annually, water transport information where possible (as balance sheet data are not available

for this mode), as well as rail, air, oil and gas pipelines information.

Also included are data on Canadian Pacific. This Company has a more normal financial structure than does the total railway industry, when compared with other companies. The financial structure of the total railway industry is dissimilar to that of other industries due to the financial situation of the Canadian National Railways. For determining rail rates and other related matters over the years, The Board of Transport Commissioners has used Canadian Pacific as the "yardstick" railway.

TABLE VIII

OPERATING RATIO OF TOTAL OPERATIONS AND RETURN ON OWNERS' EQUITY FOR ROAD TRANSPORT, RAIL, AIR, WATER, OIL PIPELINES AND GAS PIPELINES, AND CANADIAN PACIFIC RAILWAY COMPANY, CANADA, 1964 AND ALSO 1965 WHERE AVAILABLE (SHOWN IN BRACKETS)

Mode of Transport	Operating Ratio		Return on Owners' Equity	
	Percentages			
Road	94.7	(94.8)	14.9	(15.1)
Rail	93.8	(94.1)	1.2	(1.4)
Canadian Pacific	92.0	(92.5)	3.8	(3.9)
Air	94.2	(93.6)	19.7	(N/A)
Water	98.5	(98.1)	N/A	(N/A)
Oil Pipelines	39.2	(39.2)	27.1	(31.7)
Gas Pipelines	66.8	(N/A)	11.3	(N/A)

SOURCE: Calculated from data contained in Appendix XXXV, sheet two, and D.B.S. reports listed thereon.

For the year 1964 the operating ratio of road transport was fairly comparable to rail and air transport and 2.7 above that of the Canadian Pacific Railway Company. The return on owners' equity for road carriers was 14.9 per cent. This was more favourable than that shown for railways and gas pipelines, but not as favourable as that shown for air transport and oil pipelines.

Appendix XXXV, sheet three, indicates for 1964 a wide diversification in capitalization ratios for the various modes. There is a high proportion of debt as compared to owners' equity shown for rail (61.8 per cent), air (86.0 per cent), oil pipelines (63.1 per cent), and gas pipelines (70.4 per cent). Road transport indicates a percentage of 39.0, while Canadian Pacific has 44.4 per cent of its total capital in debt. Road transport evidences a higher equity proportion than do the other modes. This no doubt results from the atomistic nature of the industry, and a shorter life for road equipment, as compared with other modes, which could necessitate greater participation by the owners. There is a greater risk existing and there is less ability to obtain debt financing. On the other hand, for example, railways have had considerable debt financing, with a large number of railway bonds having been guaranteed by governments. Also, Air Canada is a government-secured undertaking, and Canadian Pacific Air Lines is secured by the parent Company.

Comparison of Motor Carriers With Groups of Other Companies

For a further comparison, Table IX below shows, for the year 1965, the return on owners' equity for sixteen industrial groups, which include 287 selected companies in Canada. Also shown is the motor carrier group earning $20,000 or more annually. Both large and small companies are included in the selection. There is a wide diversity of net income for the 287 companies involved.

TABLE IX

RETURN ON OWNERS' EQUITY - 287 SELECTED COMPANIES AND MOTOR CARRIERS EARNING $20,000 OR MORE ANNUALLY, CANADA, 1965

Group	Number of Companies	Per Cent Return on Owners' Equity
Printing and Publishing	11	16.2
Non-Ferrous Metals	8	15.7
Motor Carriers: Classes I, II and III	2,027	15.1
Foodstuffs	13	11.9
Pulp, Paper and Lumber	18	10.5
Iron and Steel	49	10.4
Merchandising	28	10.4
Construction and Building Materials	17	10.3
Chemicals and Allied Products	15	10.2
Electrical Equipment	13	9.6
Textiles	13	9.4
Oils and Pipelines	15	9.4
Miscellaneous	39	9.1
Beverages	8	8.6
Milling and Grain	5	8.5
Public Utilities	24	8.0
Transportation	11	4.0

NOTE: In 1964, for these same groups of companies, Printing and Publishing evidenced a return of 15.0 per cent, while Motor Carriers were second with 14.9 per cent.

SOURCE: These data have been calculated from information contained in The Financial Post, dated May 13, 1966, pp. 52 and 53; D.B.S., Motor Carrier - Freight, Parts I and II, 1965.

The above is a rough comparison at best because of the great diversity in the size of companies and because of the limited number of companies included in each group. Both large and small companies are included in the motor carriers. This comparison does, however, indicate that the motor carriers compare favourably.

One further comparison which may be made is shown in Appendix XXXVI, sheet one, which includes the net income to owners' equity, and to total capital invested, for a sample of Canadian companies which earned a profit in 1964. These data were extracted from taxation statistics. About one-fifth of all Canadian companies are used in the sample. Following are the rates of return on owners' equity:

	Per Cent
Forestry	17.7
Fishing	17.4
Agriculture	15.9
Construction	16.2
Motor Transport	14.2
Services	13.2
Wholesale Trade	12.0
Retail Trade	10.9
Manufacturing	8.5
Transportation, Storage, Communications and Utilities	6.5
Mining, Oil and Quarrying	5.3
All Companies	6.8

It will also be noted from Appendix XXXVI, sheet one, that fairly comparable results are shown for the return on total invested capital, which would suggest a low proportion of loan capital.

While there may be greater implicit costs for some of these groups as compared with others, motor transport shows a fairly favourable position.

Conclusions on Financial Data

Three factors emerge from the foregoing analyses. First, from a revenue point of view the Canadian motor carrier industry is an important factor in the economy. Second, when compared with the United States situation, it would appear there is still growth potential for the Canadian motor carrier industry, even though it may not be possible to equal the United States level in the immediate years ahead. Third, the motor carrier industry evidences a fairly favourable financial position.

SIZE OF TRUCKING COMPANIES

With the passage of time there is a tendency for mergers and expansion of truck lines in Canada. This is also a distinct trend in the United States. In its most recent publication, the Banker's Analysis stated:

> ...Mergers continued at a rapid pace during the year further reducing the number of overall carriers while giving birth to larger and more efficiently operated companies....[8]

It was observed that since World War II, 10,000 United States carriers had been created into today's giant trucking companies. It was anticipated that in twenty years there would be 200 coast-to-

coast "super-giants" and 300 to 500 large regional carriers.[9]

In Canada the acquisition of motor carriers has been undertaken by the railways, referred to earlier, and, also, by Canadian and United States motor carriers. A number of these acquisitions have been made recently.[10]

To better understand the situation, let us consider a few factors. First, a review of the financial ratios of various sizes of carriers in Canada, shown below in Table X, would seem to be appropriate.

TABLE X

FINANCIAL RATIOS RELATING TO MOTOR CARRIERS, CLASSES I, II, III AND IV, CANADA, 1965

Ratio	Class of Carrier I	II	III	IV
	Percentages			
Operating	95.5	95.1	87.0	71.5
Net Income to Operating Revenue	2.6	4.0	13.2	N/A
Return on Total Capital	7.0	9.9	21.4	N/A
Return on Equity	11.8	17.2	30.8	N/A
Capitalization:				
Debt	40.8	42.7	30.5	N/A
Equity	59.2	57.3	69.5	N/A

SOURCE: D.B.S., Motor Carriers - Freight, Parts I and II, 1965.

Examination of the above ratios indicates that the smaller the class of carrier, the better the operating ratio. Class III carriers show a much higher return on invested dollars and owners' equity than do Class I and II carriers. Class III carriers also indicate a lower proportion of debt.

However, it would be hasty to conclude that the smaller carriers are more efficient even though the return per investment dollar is higher. There are various reasons why one must be cautious about conclusions reached.

Class III carriers earn less than $100,000 annually, while Class IV carriers earn less than $20,000 annually. Often smaller motor carriers have larger implicit and less overhead costs than do the larger carriers. For example, frequently the owner of a small company will drive one of his trucks; he may use his own private residence as headquarters for his company; his garage or parking facilities may be located on his own personal residence property; and his wife may act as part of his office staff, dispatching trucks, answering the telephone, keeping accounts and/or carrying out similar duties. Frequently a smaller operator will have a part-time bookkeeper, and an accountant who only closes the books and compiles the statements.

On the other hand, larger operators generally have large storage lots and garages, office buildings, a larger number of specialists, such as full-time accountants, lawyers and operating

personnel. The larger carriers generally travel longer distances and often find it necessary to establish terminals for the breakup of loads for city delivery. Further, larger carriers are more likely to be called upon for community services and larger community contributions. Thus, if implicit costs for smaller carriers were expressed as explicit costs, and they faced greater business and community cost pressures, the financial ratios for the four classes of carriers may be much more similar.

Probably it can be safely said that small carriers do not make less per invested dollar than do the larger ones. Greater pressures for takeover and for merger are probably emanating from other sources.

Throughout industry today there is a tendency for takeover and merger. The objectives can be expressed in terms of profit-making, service, social responsibility and survival. As was mentioned in Chapter VIII, modern business is more complex than in former years. Frequently small businessmen find it difficult to cope with the many problems. Often the owner of a small trucking firm endeavours to direct sales, personnel, operating, financial and all other important matters. His problems increase with each new truck acquired. Further, once a company commences to grow, often the employees will become unionized and union pressures may become difficult for the small operator to withstand. Also, financing for expansion purposes is generally more easily obtainable by larger companies. This in turn enables greater specialization in the major

fields of business activity, i.e., sales, accounting, finance, operations and personnel. A further important factor is that frequently the larger carrier can tap a larger market, and probably can be much more competitive with other large trucking companies and the railways.

In addition to the foregoing, even though it may be proven that a smaller operation returns a greater amount on the invested dollar, the larger organization results in a larger total amount being earned. In 1965 Class I carriers had an average net income of $61,650 per carrier, Class II carriers averaged $9,146 per carrier, while those in the Class III category averaged $5,962 per carrier.[11]

Finally, there is one major psychological factor to be considered. This is the power that the larger organization affords to those who manage and/or own the organization. "Bigness" is a subject which is currently receiving attention in business and financial newspapers and periodicals. There are frequent reports on company size, economic leaders in the community and similar topics.

While there may be others, these are some of the major reasons which are encouraging the creation of larger trucking companies.

LEASING

Truck leasing is a feature which has become more important in recent years. This is especially so with respect to private truck fleets. As a matter of fact, much of the literature on truck leasing

deals with the value of truck leasing to manufacturing and other firms. Nevertheless, some for-hire carriers have undertaken leasing in at least two ways. First, by leasing their equipment. This is often called finance leasing. Second, by the leasing of tractors from the operators of such tractors. This second type of leasing is referred to as a lease-operator arrangement. There are various other arrangements for short-term rental and longer-term leasing. For example, private fleets often obtain equipment on a full-service leasing base, which means that everything but the driver is supplied by the lessor, while in other cases only the equipment is leased.

Statistical Data on Leasing

Aggregate Information. While there is a paucity of aggregate automotive rental and leasing data in Canada, in the United States such information is available. It is estimated that in 1965 revenues from car and truck rental and leasing totalled $1.8 billion, involving 822,000 vehicles. Included in the total were 228,000 leased trucks accounting for $660.0 million revenue. Many of these vehicles were used by private companies. According to the Car and Truck Renting and Leasing Association, annual growth over the past decade has averaged between fifteen and twenty per cent. It is now estimated that renting and leasing accounts for approximately four per cent of the total automotive business in the United States. It is expected that this proportion should reach ten per cent by 1970.[12]

For-Hire Carriers. In the Motor Carrier report of the Dominion Bureau of Statistics there is some limited information on leasing by for-hire carriers. Since 1959 there has been shown an account for purchased transportation. Included are costs for lease-operators, equipment leasing, aircraft charter and piggyback.

In 1959 purchased transportation amounted to $40.8 million,[13] or 12.5 per cent of total expenses. By 1965 this had increased to $103.9 million, or 15.3 per cent of total expenses. In 1964 the same percentage was 13.6.[14]

While a specific breakdown of purchased transportation is not available, it was possible to obtain from the Dominion Bureau of Statistics, a distribution for 1964 for thirty-one of the largest carriers. A total of $31.5 million of purchased transportation was involved, of which lease-operators accounted for 41.0 per cent, equipment leasing for 18.4 per cent, aircraft charter for 0.6 per cent and piggyback for 40.0 per cent.[15] While this is a rough guide at best, application of the above percentages to the total amount of purchased transportation for 1965 would result in a figure of $41.6 million for lease-operators and $18.7 million for leasing of equipment. Together these two items would constitute approximately 9.6 per cent of the total expenses for 1965.[16]

Equipment Leasing

Table XI below shows the proportion of leased vehicles used by Class I, II and III for-hire carriers in Canada, in the years 1958 and 1965.

TABLE XI

PERCENTAGE DISTRIBUTION OF VEHICLES ON AN OWNED AND LEASED BASIS, CLASS I, II AND III CARRIERS, CANADA, 1958 AND 1965

Vehicles	1958	1965
	Percentages	
Trucks:		
Owned	96.0	95.0
Leased	4.0	5.0
	100.0	100.0
Tractors:		
Owned	90.8	87.1
Leased	9.2	12.9
	100.0	100.0
Trailers:		
Owned	96.0	92.3
Leased	4.0	7.7
	100.0	100.0

NOTE: This information was first available in 1958.

SOURCE: D.B.S., Motor Carriers - Freight, 1958 and 1965, Parts I and II.

During this seven-year period the proportion of leased trucks increased slightly, while a 3.7 percentage increase in proportions was experienced for leasing of both tractors and trailers. The increase in tractor leasing could be a reflection of the expansion of the lease-operator type of arrangement.

In 1945 Class I and II carriers in the United States leased

21.1 per cent of their power units. By 1953 the proportion had increased to 40.7 per cent, falling back to 37.3 per cent by 1958. By 1964 (the latest data available) the estimated proportion had reached 43.5 per cent.[17]

A further reference on leasing is contained in Appendix XXXVII. The larger carriers show a greater proportion of leased trucks, tractors and trailers than do the smaller carriers. For example, Class I carriers owned 91.4 per cent of their trucks, while Class III carriers owned 99.0 per cent. Class I carriers owned 83.8 per cent of their tractors, while Class III owned 97.2 per cent. The lower percentage figure for Class I carriers could reflect the greater use of lease-operator arrangements.

Effect of Leasing on Trucking

If private trucking operators increase their leasing of equipment, the growth effect on total trucking will be of an indirect nature. For example, if a manufacturer is able to release capital and some of management's time from the problems of a fleet of trucks, it could well be that his business may be expanded in other respects, generating additional requirements for transportation services.

If a for-hire carrier embarks on a project of leasing equipment, the major effect could be to release its capital, thus enabling it to expand more rapidly than otherwise. Also, it would place the trucking operation on a "pay-as-you-go" basis, i.e., making

the monthly lease payment each month as the equipment earns revenue. The for-hire operator's expansion would tend to attract traffic from other modes of transport and may possibly generate new business, in that greater transport facilities may be provided. This would encourage the expansion of manufacturing and other types of plants. It may allow a trucking operator to compete more effectively with the railways and produce a reduction in freight costs for the shipper, thus, enabling him to expand his firm by extending market distances.

Whether or not leasing could have a significant effect on economic growth is difficult to determine at this point in time. From the data available there would appear to be a broad field for expansion in this area.

PRIVATE VERSUS FOR-HIRE TRUCKING

There exists a good deal of controversy on the subject of whether private trucking is more advantageous than the use of for-hire carriers. Experts in traffic management caution against being deluded by private trucking short-run gains to a company's detriment in the long-run time period. They warn that careful consideration must be given to every facet of the operation, including a balanced movement of loads, type of commodity to be transported, special equipment required, economies to be effected, how effective the for-

hire carrier is performing, whether the additional plant required is justified in terms of management's time, labour problems, and many other items.[18] If economy can be achieved by the use of private trucking, the saving in transportation costs can be directed into expansion of the company's main operational undertaking, or used for other development. If improved service can be achieved, then the way is open for expanded operations. Careful consideration should be accorded to all facets of the subject before a decision is made to change from one method of transport to the other.

CONCLUSIONS

An analysis of the information contained in this chapter would lead one to the conclusion that from a revenue viewpoint trucking has become an important mode of transport in Canada. In the United States motor carriers enjoy about 13.1 per cent more of the transportation market revenue in that Country, than do the for-hire carriers in Canada. As suggested previously, for a number of reasons - climate, population dispersion, geography and other factors - probably the Canadian for-hire motor carrier will not reach the proportionate level of their counterparts in the United States. For the Canadian carriers, a 13.1 per cent increase in proportion would, on the present base, require approximately a 38.0 per cent increase in revenue. They may not reach this level but in the years ahead, the for-hire carriers have a considerable opportunity for expansion.

A comparison of the Canadian carriers' financial information with that of the larger United States carriers, with other modes of transport in Canada, and with groups of Canadian companies, would suggest that the Canadian motor carriers compare favourably.

The trend to larger companies is taking place in the motor carrier industry, as it is in other industries. Mergers, acquisitions, and consolidations are being effected.

Leasing of equipment has been increasing in recent years and it is an important factor in motor carrier operations. Also facing the for-hire carrier is the decision of the non-transportation firm to operate either its own fleet or to continue to use the public carrier. While there seems to be a tendency for private fleets to increase proportionately, as shown in the population data in Chapter I, experts in the field warn against hasty action in the transfer from public transport to the private fleet.

The concluding chapter which follows, attempts to estimate the possible growth in the motor carrier industry within the next few years.

FOOTNOTES FOR CHAPTER IX

1 a) Passenger revenues and any related services have been eliminated.

b) The Road Transport figures for Canada were taken from the projection of for-hire revenue in Appendix XXXIX, sheet six, of this document. They vary only slightly from estimates made by D.B.S., Transportation and Public Utilities Division, of $890.0 and $980.0 million, respectively, for 1964 and 1965. See The Financial Post of March 26, 1966, p. 52.

c) The Air data for Canada includes Canadian carriers only.

d) Included in the United States figures are revenues of Federally regulated carriers only. Coverage is - Railroads, Classes I and II; Motor Carriers, Classes I, II and III; Regulated Water Carriers; Oil Pipelines; and Scheduled Domestic Air Service.

SOURCE: D.B.S., Railway Transport, Part II, 1964 and 1965; D.B.S., Gas Utilities (Transport and Distribution Systems) 1964; D.B.S., Civil Aviation, 1964 and Preliminary Figures, 1965; D.B.S., Water Transportation, 1964 and 1965; D.B.S., Oil Pipelines, 1964 and 1965; The Financial Post, November 19, 1966, p. 17; and American Trucking Trends 1966, American Trucking Associations, Inc., p. 9.

The American Trucking Associations, Inc., obtained their figures from the following sources:

Interstate Commerce Commission, Bureau of Transport Economics and Statistics - Transport Economics, I.C.C. Annual Reports; Federal Aviation Agency - Statistical Handbook of Aviation; Air Transport Association of America - Facts and Figures about Air Transportation; Civil Aeronautics Board - Handbook of Airline Statistics.

The United States data for 1965 are estimates, part of which research was done by the American Trucking Associations, Inc.

2 American Trucking Trends 1966 (Washington, D.C.: American Trucking Associations, Inc.), p. 9.

3 Ibid., Front Cover.

4 D.B.S., National Accounts, Income and Expenditure (Ottawa: Queen's Printer), 1926-1956, p. 33, and 1965.

5 American Trucking Trends 1966, Op. cit., pp. 13 and 17.

Class I and II carriers include those earning $200,000 or more annually.

6 This information is not available for those carriers earning less than $20,000 a year.

7 Arthur J. Bruen, Jr., "1966 Banker's Analysis of the Motor Carrier Industry for 1965" (Washington, D.C.: American Trucking Associations, Inc.), p. 3.

8 Ibid.

9 Ibid.

10 Recently Hanson Transport Company of Hamilton was purchased by Canadian Freightways, Ltd., of Calgary, who in turn are owned by Consolidated Freightways, Inc., Menlo Park, California. This latter Company is reported to be one of the largest in the United States. Some time ago Gill Interprovincial Lines, Ltd., acquired Pacific Inland Express, Ltd., Vanvouver, and just recently acquired Bestway Express, Ltd., Winnipeg. Maislin Brothers Transport, Ltd., Montreal, has for some time been acquiring small Quebec firms and recently purchased Argosy Carriers, Ltd., Toronto, and N.Y. & V. Express, Inc., in the United States. The Red Star Express Lines of Auburn, Inc., Auburn, N.Y., recently acquired Wallace Transport Company, Port Colbourne, Ontario, and within the past two years, Direct Winters Transport, Ltd., a large Canadian Company, was acquired by Brink's Express Co. of Canada, a subsidiary of Brink's, Inc., of Chicago. These are but a few. There are others.

See: "Trucking Takeover Extends U.S. Links," The Financial Post, Op. cit., June 3, 1967, p. 4.

11 D.B.S., Motor Carriers - Freight, Parts I and II (Ottawa: Queen's Printer), 1965.

12 Periodic Bulletin (Chicago: Car and Truck Renting and Leasing Association), January 1, 1966.

13 For Class IV carriers, purchased transportation expenses were included in other transportation expenses. However, the latter totalled only $482,000. Thus purchased transportation would be something less and would not be too significant.

14 D.B.S., Motor Carriers - Freight, Op. cit., 1959, 1964 and 1965; and D.B.S., Moving and Storage, Household Goods (Ottawa: Queen's Printer), 1964 and 1965.

15 D.B.S., Transportation and Public Utilities Division.

16 D.B.S., Motor Carriers - Freight, Op. cit., 1965.

17 American Trucking Trends 1966, Op. cit., p. 26.

18 "Private vs Public: Traffic Managers Cautioned Against Private Trucking Short-Term Gains," Motor Carrier, Op. cit., March, 1965, pp. 10-15.

CHAPTER X

CONCLUSIONS AND THE TRUCKING INDUSTRY BY 1972

INTRODUCTION

The previous chapters have dealt with a number of factors which will affect the trucking industry in the immediate years ahead. This chapter attempts to draw conclusions on the future of the industry as a whole, and also on each class of trucking. Mathematical projections are used in conjunction with the material contained in the foregoing chapters to arrive at some understanding of the possible growth in trucking. The mathematical projections predict the trend, if existing growth forces remain unchanged. The material examined in the preceding chapters will shed light on possible adjustments to present growth trends.

INTERCITY NET TON MILES

Projection

Intercity net ton miles, the overall important indicator of freight transported by road, is composed of for-hire, private intercity and farm net ton miles. To project mathematically intercity ton miles up to 1972, the Gross National Product in current dollars has been used. Appendix XXXVIII contains calculation data, based on the period 1939 to 1965, for a line of regression, the

coefficient of correlation and the projection of the Gross National Product and intercity net ton miles.

Sheet five of the above-mentioned Appendix, indicates a coefficient of correlation of .925 between Gross National Product in current dollars and intercity net ton miles. This suggests a very close association between the two indicators.

There is not an official Government projection for Gross National Product in current dollars. However, the Federal Department of Finance has suggested that possibly an annual increase of 7.0 per cent could be utilized for projection up to 1972, depending on its use (see Appendix XXXVIII, sheet six). Since receiving this information, the Fourth Annual Review of the Economic Council of Canada has suggested a slight downward revision for economic growth beyond 1970. Therefore, for 1971 and 1972, 6.75 per cent has been used (see sheet seven of Appendix XXXVIII). As this projection for the motor transport industry is in broad ranges it would seem these suggested figures are adequate for our purposes.

Using the Gross National Product of $57.8 billion for 1966, published by the Dominion Bureau of Statistics, and an annual 7.0 per cent increase to 1970, with 6.75 for 1971 and 1972, a figure of $86.4 billion has been calculated for 1972.

Application of the regression formula, shown on sheet three of Appendix XXXVIII, to the above projected Gross National Product, results in an estimated increase in intercity net ton miles

from 19.4 billion for 1965 (the latest available) to 35.2 billion by 1972, an 81.4 per cent increase (see sheet six). Following are the projected annual figures:

Year	Billions of Net Ton Miles
1966	23.1
1967	24.9
1968	26.7
1969	28.6
1970	30.7
1971	32.9
1972	35.2

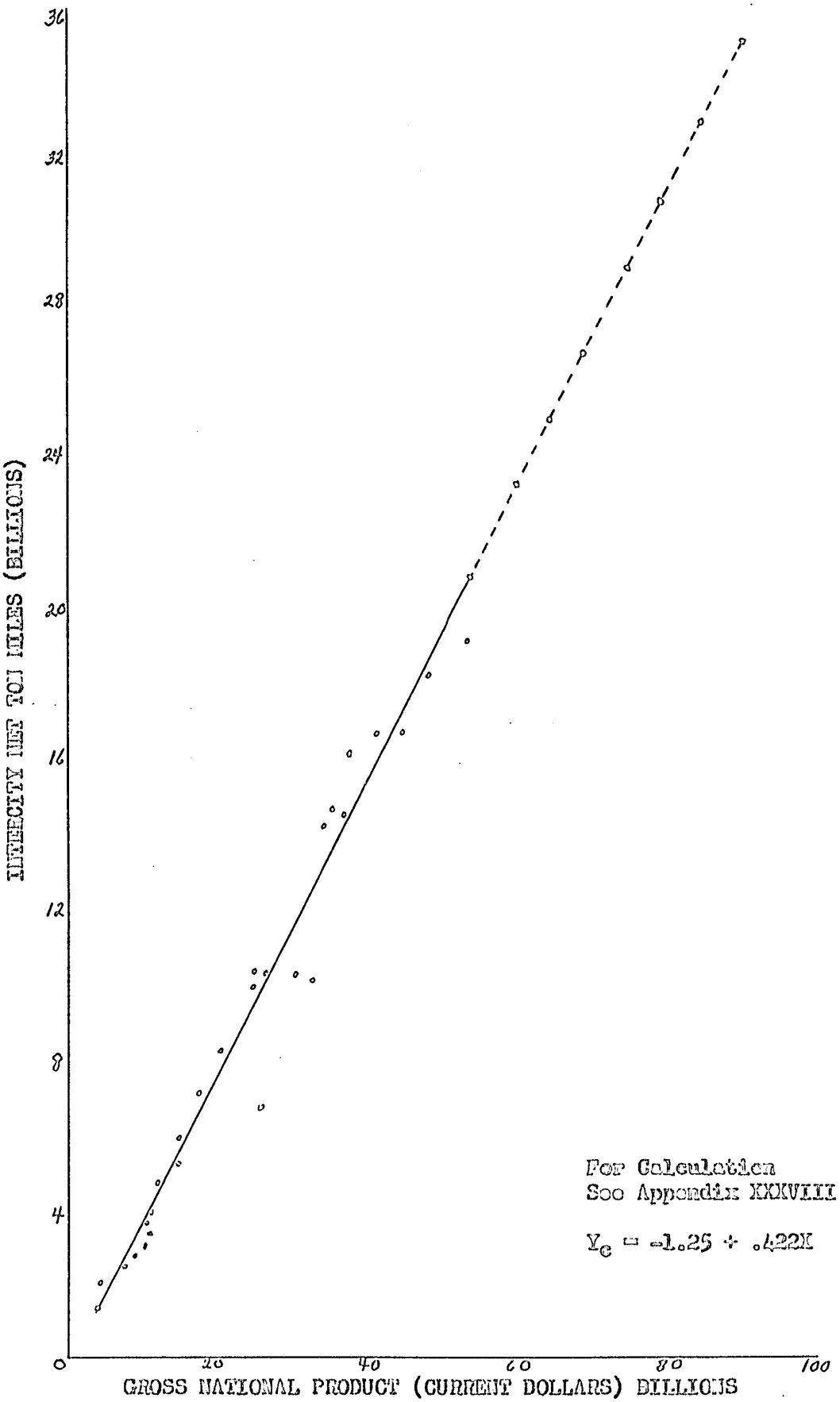
Chart VII shows the projected regression line for intercity net ton miles and Gross National Product in current dollars.

Projection of Component Parts

In order to gain some understanding as to the suggested growth in the component parts of intercity net ton miles, i.e., for-hire, private intercity and farm trucks, Table XII which follows shows a mathematical projection for each class of truck. The projection is based on the annual geometric increase in growth by each class from 1957 to 1963 (see Appendix XXXIX, sheets one to four). The estimated 1972 intercity net ton miles resulting from these geometric projections total 35.0 billion. The regression projection, referred to earlier, suggested 35.2 billion net ton miles. In the table below, the difference of 0.2 billion has been distributed amongst the three classes of trucks, on the basis of their proportionate contribution to the geometric projection.

CHART I

PROJECTION OF ROAD INTERCITY NET TON MILES BASED ON PROJECTED INCREASE IN GROSS NATIONAL PRODUCT IN CURRENT DOLLARS



Subsequent to the table, are comments on each class of trucking and an enumeration of the factors which could favourably or unfavourably affect the mathematical trends.

TABLE XII

PROJECTED INTERCITY NET TON MILES FOR FOR-HIRE, PRIVATE INTERCITY AND FARM TRUCKS, CANADA, 1963 TO 1972

Class	1963		1972		
	Net Ton Miles	Per Cent of Total	Projected Net Ton Miles	Per Cent of Total	Per Cent Increase 1963-1972
	Billions		Billions		
For-Hire	12.0	71.4	29.0	82.4	141.7
Private Intercity	4.3	25.6	5.5	15.6	28.0
Farm	0.5	3.0	0.7	2.0	40.0
Total	16.8*	100.0	35.2	100.0	109.5

NOTE: * Because of rounding, intercity net ton miles varies by 0.1 with that shown in Appendix XXXVIII, sheet one.

SOURCE: Calculations of data contained in Appendix XXXIX, sheets one to four.

Intercity For-Hire Trucking

While each segment of trucking is important and each of the four is making a significant contribution to the Canadian economy,

the major producer of road transport net ton miles is the intercity for-hire trucking group. Probably this group could be considered the most important of all and it will likely be affected by anticipated changes more so than any of the other three. This does not in any way depreciate the contribution being made by the other groups as they serve in their own unique capacity. Rather, it emphasizes the role of the intercity for-hire carrier.

For-Hire Trucking - 1972. Table XII indicates for 1972 a projected 29.0 billion net ton miles for the for-hire group, a 141.7 per cent increase over the 1963 figure. Further, the proportion of intercity net ton miles produced by this class of truck, if the projections were realized, would increase from 71.4 per cent in 1963 to 82.4 per cent by 1972.

Appendix XXXIX, sheet six, indicates that for-hire carrier revenue projected from a level of $818.9 million in 1963, could reach $1,764.0 million by 1972. This would be an increase of 115.4 per cent.

Other Factors. While the foregoing mathematical projections have been made on historical data, no two periods, or for that matter no two years, are the same. Fluctuations in the economic growth of the economy can effect change in the amount of trucking service demanded. Political, social and economic factors which are not presently known could all emerge and have a significant adverse or favourable effect on the demand for truck service.

Of the factors examined, let us refer to those which could favourably affect road transport and aid it to compete more effectively.

First, from a traffic point of view there are various factors which are favourable to road transport. This mode of transport enjoys a powerful service advantage. It was clearly evidenced in Chapter III, that demand for road transport in the short-haul field, and to some extent in the intermediate haul, has remained strong in spite of the onslaught of competitive rates set by the railways. In addition, road transport has made some progress in extending lengths of haul.

While railway competitive rates may be extended in the future, as shown in Chapter II, the annual increase in railway agreed charges is diminishing. There will be a benefit to intercity for-hire trucking by a limitation on the erosion of traffic by the further use of the railways' economic power for rate-setting. Total road intercity net ton miles in 1962 and 1963 remained almost unchanged. However, in 1964 and 1965 increases of 16.0 and 6.0 per cent, respectively, were experienced. In addition, as stated in Chapter IV, within the past year the railways have increased their rates on four occasions. Only a few exceptions were made, apart from statutory rates which are subject to Parliamentary control.

Further, benefits will accrue to for-hire trucking by the elimination of subsidies to the railways, probably requiring further increases in railway rates; by the possible participation

of trucking in other subsidies, aiding them to be equally competitive in such situations; by elimination of "head-end" equipment from passenger trains, making traffic available for trucks; from the increased decentralization of industry; and from the possibility for representation at railway rate hearings.

Second, from the viewpoint of regulation, if it is effected, Federal control of extra-provincial carriers will allow such carriers to participate fully in policies and practices laid down for extra-provincial transportation. Also, they may receive full benefit from research carried out by the Canadian Transport Commission. Further, any relaxation of weight and length restrictions by the provinces will aid both extra- and intra-provincial carriers.

Third, there are various factors which will facilitate operations and/or reduce cost. Among them are the increased use of piggyback and containers, where advantageous; the greater use of diesel and gas turbine power; the greater use of bulk-hauling equipment; improvements in shed and office equipment; more extensive management and employee training; extension of reciprocity agreements; improvement and extension of highways; the opportunity for leasing, if beneficial; and the possibility of a seven-day a week operation.

In addition to the foregoing, two overall factors which will further aid the motor carriers are the present fairly favourable financial position and the emergence of larger carriers.

Factors which could have an adverse effect on for-hire carriers include additional costs from labour and safety legislation; extension of railway competitive rates and railway action from freedom in rate-making; and expansion of air cargo for longer distances. As pointed out earlier, the safety legislation has not yet been passed and, also, long-term benefits could accrue from it; the labour legislation has not yet been fully applied, so its effects cannot be properly assessed; railway competitive rate-making has diminished from earlier years; and air cargo is just emerging from the embryonic stage. Further, air cargo could aid the short-haul carrier.

Integration. Besides the advantages and disadvantages for motor carriers, there will be the third effect of integration or a blending of the modes of transport. Extension of this trend will take place by increased use of piggyback, interchangeable containers and further acquisition of truck lines by the railways.

This integration of the various modes of transport would seem to be beneficial as each tends to perform the tasks in which it is most efficient. Nevertheless, if monopoly situations appear then there could be cause for concern. Therefore, Government should carefully observe developments in this area to ensure that the competitive situation is not weakened to a lesser degree than would seem to be desirable.

Conclusions. Ton mile increases cannot be attached to the foregoing factors. Nevertheless, the above enumeration suggests that there are many more favourable than unfavourable factors for intercity for-hire trucking. Therefore, while the mathematical projection suggests that for-hire transport could increase from 1963 to 1972 by almost one and one-half times, it may well be exceeded unless an economic setback occurs.

It would seem that intercity for-hire transport can grow from three aspects. First, from the economic growth of Canada. Second, from a possible increase in the for-hire share of the total transportation market (if the United States motor carrier trend is followed, even though not equalled). Third, from the existence of the favourable factors mentioned.

Competition with the railways exists, and could, to some extent, become more pronounced with the new transportation environment. Therefore, if the suggested goals are to be attained, it will be necessary for motor carriers to bend every effort for improvement, to take advantage of every opportunity available and to operate as efficiently as possible.

Private Intercity Trucking

Private Trucking - 1972. Table XII indicates for 1972 a projected 5.5 billion net ton miles for the private intercity trucking group, a 28.0 per cent increase over the 1963 figure. However,

if the above projection were realized, the proportion of intercity net ton miles produced by this class of truck would decrease from 25.6 per cent in 1963 to 15.6 per cent by 1972.

Other Factors. It would seem that the future of private intercity trucking is inextricably bound up with intercity for-hire transport and that of rail transport. The new transportation legislation will bring some intensification of competition between the railways and intercity for-hire carriers, although, as pointed out previously, there has been existing a significant competitive struggle between for-hire trucking and the railways. Any intensification of this competitive struggle, no matter how small, will probably result in more attractive rates for shippers and could influence companies with private fleets to look toward for-hire carriers for transportation service. The object of increased use of competitive forces to control transportation, as contemplated by the Federal authorities, would not seem to be one which will encourage expansion of private fleets because of competitive rate-setting. Thus the economic transportation environment will probably be less encouraging to future expansion of private truck fleets.

It was mentioned in Chapter I, that by 1965 private intercity trucking had shown a small proportionate increase of the total Canadian truck population, reversing an earlier trend of decreases. It must be remembered, however, that the newly-proposed transportation environment was not in effect in 1965. Only the immediate years ahead

will unfold the actual results from the contemplated changes mentioned.

Further, more awareness by traffic managers of the pitfalls of private fleets may have a dampening effect on private trucking. There will probably also be a greater use of air cargo service over longer distances. This latter feature will be detrimental to long-distance private trucking but more so to for-hire trucking.

On the other hand, there are other factors which may favour an increase in private intercity trucking. One which may encourage greater use of private fleets will be the continuance of strikes and strike threats in the for-hire trucking and railway industries. The desire of shippers to have transportation service available when required may influence further acquisition and extension of private fleets. This was evidenced in the surveys made at the time of the for-hire carriers' strike in Ontario in 1966.

Some of the technological changes which will aid private trucking will be the increased use of piggyback; the use of containers, as cited in the case of Dominion Electrohome Industries; the increased use of diesel equipment and the adoption of gas turbine trucks for larger units; and an extension in the use of specialized bulk-hauling equipment.

With the large range of commodities it is now possible to transport in bulk, it would seem that companies such as those manufacturing and processing oil and oil products, chemicals and

chemical products, cement, fertilizers and some food products, to mention only a few, will expand their private fleets. If, however, for-hire rates are sufficiently attractive, it could well be that companies will encourage an expansion of contract for-hire carriers, providing specialized bulk equipment.

In the immediate years ahead, it would seem reasonable to expect that there will be an increase in the leasing of private fleets. This will release capital, eliminate maintenance, and allow management more time for other problems. In addition, highway improvement and expansion will aid private trucking, as will any relaxation of weight and length restrictions.

Conclusions. While it is difficult to attach any statistical value to the factors enumerated above, it would seem that the 28.0 per cent mathematically-projected increase in private intercity trucking would be a reasonable growth figure to expect. If national economic growth continues, and factors favourable to private trucking become more intensified, it may even attain a 40.0 per cent increase, but, as mentioned, an intensification of the "rail-for-hire" struggle will probably be a major deterrent to private fleet growth.

Farm Trucks

The third segment of the intercity group is farm trucking. Table XII indicates that farm truck net ton miles may increase from 0.5 billion in 1963 to 0.7 billion by 1972, or a 40.0 per cent

rise. In 1963 this class of truck produced about 3.0 per cent of the total intercity net ton miles. By 1972 the projection suggests a proportion of 2.0 per cent.

Farm trucking is extremely important in rural areas, not because of a large production of net ton miles, but rather from the convenience point of view. Farm trucks enable rural dwellers to transport their produce to market and also, they frequently serve in the place of private passenger cars for transportation of persons.

Of all the factors reviewed in the previous chapters, probably the abandonment of rail branch lines will be the only major change which will effect an increase in farm trucking. This effect will be limited, however, because of the large number of branch lines which are being protected from abandonment by the Government. Two other favourable effects which may be experienced will be the increased use of diesel equipment and highway improvement and expansion.

Possibly any major increase in net ton miles produced by farm vehicles will result primarily from overall economic growth. To anticipate a 0.2 billion increase in net ton miles, as mathematically projected, would not seem to be unreasonable, provided the nation's growth simulates its past pattern.

Summary

From our review, it would appear that for-hire trucks will

increase their proportion of total intercity net ton miles. Further, it is quite likely that there could be more changes affecting this class of truck than will affect the other two groups. While private trucks and farm trucks are important, the for-hire group is playing, and will play, an important role in Canadian transportation.

URBAN TRUCKING

In 1963 urban for-hire and private trucking accounted for 1.9 billion net ton miles. Appendix XXXIX, sheet five, indicates a mathematical increase from the 1963 level to 3.4 billion in 1972, a 79.0 per cent increase.

Apart from intercity carriers, which perform some urban service, urban trucking is an entity unto itself. Competition does not emanate to any degree from other modes of transport but rather from within the urban trucking group. It is, however, a strongly competitive market for for-hire carriers, with a large number of private trucks being operated. Growth in this segment would seem to depend on urban growth and, also, on overall Canadian economic growth. If economic conditions continue as predicted, the projected increase of 79.0 per cent would appear to be a reasonable possibility.

CONCLUSIONS

An extensive examination of the Canadian Trucking Industry has been undertaken. A large number of factors have been examined.

While it is difficult to determine what might be the certain effects of the changes considered, such as the influence of passed and pending legislation, it is suggested that the industry at this point is sound. Competition between the railways and truck transport will continue and could well be intensified. On the other hand, there will be some integration of these two modes of transport, as well as an integration of road transport with both the air and water systems.

While large-scale changes may be effected gradually, some change will appear in the profile of transportation by 1972, with foundations laid for additional change. For the immediate years ahead, with the possibility of the various advantageous factors, and with the anticipated Canadian economic growth, the opportunity will exist for the Canadian Trucking Industry to continue to enjoy a period of expansion.

Appendix I

SURFACED, EARTH, AND TOTAL ROAD MILEAGES (HIGHWAYS, RURAL AND URBAN ROADS) AND VEHICLE DENSITY RATIOS, CANADA, SELECTED YEARS*

Year	Mileages				Motor Vehicle Density Per Mile of Surfaced Road	
	Paved	Gravel and Other	Earth	Total	All	Commercial
	Thousands				Number	
1932	8.7	99.2	252.1	360.0	10.3	1.4
1939	17.7	116.8	240.8	375.3	10.7	1.7
1949	29.8	155.6	202.4	387.8	12.4	3.1
1960	70.5	230.7	153.6	454.8	17.5	3.7
1965	99.7	264.9	128.1	492.7	18.4	3.8
Per Cent Increase or Decrease (Rounded)						
	1,046	167	-49	37	79	171

NOTE: * While the Canada Highways Act was passed in 1919, which allotted $20,000,000 aid to road building, adjusted, comparable statistical data is, to date, available back only to 1932. Therefore, this is the first year shown in the table. The year 1939 is shown to indicate road mileage at the commencement of World War II. To aid road building, the Trans-Canada Highway Act was passed in 1949. Therefore, the year 1949 is shown to indicate the road mileage at that point in time. The year 1960 is included because that was the year of the second extension of the Trans-Canada Highway Act, the first one having taken place in 1956. By 1960 a decade of building had taken place under the Trans-Canada Highway Act. Data for the year 1965 is the latest available. While there are many other roads besides the Trans-Canada Highway, this main road is the core of the highway system. Thus, it has been used as a guide for the selected years.

SOURCE: D.B.S., Road and Street Mileage and Expenditure, 1963, p. 6, and 1965; D.B.S., The Motor Vehicle, Part III, 1960 and 1965.

Appendix II

MOTOR VEHICLE PRODUCTION AND NET EXPORTS AND IMPORTS, CANADA, 1904-1940, 1941-1950, 1951-1960 AND INDIVIDUAL YEARS THEREAFTER TO 1965

Production

Period	Passenger Cars	Motor Trucks and Busses	Total
1904-1940	2,389,102	674,811	3,063,913
1941-1950	1,014,286	1,328,934	2,343,220
1951-1960	3,229,207	917,610	4,146,817
1961	323,638	63,285	386,923
1962	424,581	80,606	505,187
1963	532,243	99,113	631,356
1964	559,603	110,687	670,290
1965	710,711	144,765	855,476

Net Exports and Imports

Period	Passenger Cars - Net	Motor Trucks and Busses - Net	Net Total
1904-1940	E. 469,274	E. 290,567	E. 759,841
1941-1950	I. 40,679	E. 820,404	E. 779,725
1951-1960	I. 596,508	E. 3,225	I. 593,283
1961	I. 97,370	I. 9,359	I. 106,729
1962	I. 82,781	I. 4,805	I. 87,586
1963	I. 44,120	E. 807	I. 43,313
1964	I. 54,213	E. 8,781	I. 45,432
1965	I. 58,617	E. 16,684	I. 41,933

SOURCE: Motor Vehicle Manufacturers' Association, Facts and Figures of the Automotive Industry, Toronto, 1966 Edition, p. 16.

Appendix III
(Sheet one of
four sheets)

MOTOR TRUCK REGISTRATIONS, BY PROVINCES, 1920-1962
(THREE-YEAR INTERVALS), ALSO 1964 AND 1965

Year	Canada	Newfoundland	P.E.I.	Nova Scotia	New Brunswick	Quebec
1920	30,313	-	51	1,300	679	4,069
1923	54,235	-	99	1,999	1,185	8,974
1926	87,182	-	125	2,989	1,626	15,018
1929	155,639	-	568	5,828	3,518	25,982
1932	157,200	-	762	6,740	3,624	27,411
1935	172,774	-	787	7,597	4,624	28,153
1938	220,109	-	1,125	9,309	6,184	35,641
1941	270,941	-	1,214	13,440	8,052	42,983
1944	302,611	-	1,471	14,583	9,103	48,471
1947	424,307	-	2,137	20,502	13,727	71,369
1950	615,598	4,453	3,615	26,860	18,818	102,689
1953	819,593	8,104	5,424	33,387	22,108	136,341
1956	975,036	12,329	6,457	38,053	24,015	171,475
1959	1,097,977	12,956	7,056	39,273	24,202	190,358
1962	1,093,919	15,880	7,313	40,807	24,799	212,481
1964	1,162,692	17,796	7,379	40,502	25,978	228,127
1965	1,205,457	17,820	7,843	40,590	26,689	231,980

Year	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon & N.W.T.
1920	16,204	1,500	1,500	1,500	3,500	10
1923	28,612	2,222	2,086	2,191	6,842	25
1926	39,012	4,674	8,686	4,362	10,661	29
1929	64,562	8,246	18,671	12,482	15,730	52
1932	63,888	9,190	15,292	14,293	15,933	67
1935	69,256	10,250	18,636	16,353	17,023	95
1938	82,634	16,055	24,791	21,221	23,005	144
1941	95,408	19,696	35,540	28,876	25,539	193
1944	99,190	21,660	41,512	34,690	31,463	468
1947	141,003	29,473	51,993	47,012	46,434	657
1950	205,616	41,188	69,073	75,671	65,705	1,910
1953	271,581	52,889	97,101	106,822	83,521	2,315
1956	324,093	60,875	110,291	120,190	105,173	2,085
1959	385,088	66,280	117,383	135,229	117,333	2,819
1962	322,888	71,076	128,591	150,727	115,996	3,361
1964	334,759	75,444	135,257	163,447	130,243	3,760
1965	344,519	75,300	143,557	169,379	143,927	3,853

Appendix III
(Sheet two of
four sheets)

NOTE: For 1920 the national figure was originally shown as 30,313. In 1934 the figure was restated and shown as 22,310. This latter figure was the number shown for "Commercial Vehicles." The difference between 30,313 and 22,310 is accounted for by an elimination of three trucks from Prince Edward Island and 8,000 from the Western Provinces. It appears that the 8,000 was an estimate made because the data were not available from the four Western Provinces for the year 1920. If data for the four Western Provinces were not included, then the national total would be inadequate. Based on national registration figures, it would seem that the 8,000 was a fairly representative figure to include for the four Provinces. Therefore, the figure of 30,313 has been included in this Appendix.

For 1947 there was a discrepancy of 1,302 between the national total and the provincial figures. The two have been made to agree.

For 1950, 1959, 1962 and 1963 British Columbia data include some busses but the number is unknown. Also for 1953 and 1956 some busses and other motor vehicles are included.

For 1953 and 1956 an estimated 517 and 642 busses, respectively, were deducted from Nova Scotia data.

For 1956 an estimated 4,341 busses were deducted from Ontario data.

With the above changes, it is considered that the figures are as closely comparable as is possible with the information available.

SOURCE: D.B.S., The Highway, The Motor Vehicle and The Tourist in Canada, 1923 and 1924; The Highway and The Motor Vehicle in Canada, 1929, 1932, 1935, 1938, 1941 and 1944; The Motor Vehicle, 1947, 1950, 1953, 1956 and 1959; The Motor Vehicle, Part III, 1962, 1964 and 1965.

Appendix III
(Sheet three of
four sheets)

CALCULATION OF THE ANNUAL GEOMETRIC INCREASE IN TRUCK REGISTRATIONS, 1920-1944, CANADA

Truck Registrations

1920 - 30,313
1944 - 302,611

Use formula $Y = ab^x$

Where
- Y = Number of registrations each year
- a = Number of registrations first year
- b = One plus annual percentage increase expressed in decimals
- x = Number of years

Solving for a:

$Y = ab^x$

$30,313 = ab^0$

$\therefore a = 30,313$

Solving for b:

$Y = ab^x$

Substituting $302,611 = 30,313\ b^{24}$

Rearrange $b^{24} = \frac{302,611}{30,313}$

or $\log b^{24} = \log 302,611 - \log 30,313$

Whence $\log b = \frac{\log 302,611 - \log 30,313}{24}$

$\log b = \frac{5.480885 - 4.481629}{24}$

$\log b = 0.41636$

$b = 1.101$

Annual geometric increase - 10.1 per cent

SOURCE: Data included in Appendix III, sheet one.

Appendix III
(Sheet four of
four sheets)

CALCULATION OF THE ANNUAL GEOMETRIC INCREASE IN TRUCK REGISTRATIONS, 1944-1965, CANADA

Truck Registrations

1944 - 302,611
1965 - 1,205,457

Use formula $Y = ab^x$

Where
Y = Number of registrations each year
a = Number of registrations first year
b = One plus annual percentage increase expressed in decimals
x = Number of years

Solving for a:

$Y = ab^x$

$302,611 = ab^0$

$\therefore a = 302,611$

Solving for b:

$Y = ab^x$

Substituting $1,205,457 = 302,611\ b^{21}$

Rearrange $b^{21} = \frac{1,205,457}{302,611}$

or $\log b^{21} = \log 1,205,457 - \log 302,611$

Whence $\log b = \frac{\log 1,205,457 - \log 302,611}{21}$

$\log b = \frac{6.081151 - 5.480885}{21}$

$\log b = 0.028584$

$b = 1.068$

Annual geometric increase - 6.8 per cent

SOURCE: Data included in Appendix III, sheet one.

Appendix IV
(Sheet one of
three sheets)

TONS OF GOODS HANDLED, BY MODE OF TRANSPORT,
CANADA, 1963

Mode	Total Tons	Per Cent	Intercity Tons	Per Cent
	Millions		Millions	
Rail	194.5	21.8	194.5	29.8
Road	568.4	63.7	348.7*	53.5
Water	45.8	5.1	45.8	7.0
Air	.1	-	.1	-
Oil Pipelines	62.8	7.1	62.8	9.7
Gas Pipelines	20.2	2.3	N/A	-
Total	891.8	100.0	651.9	100.0

NOTE: *Farm trucks are included.

SOURCE: D.B.S., Transportation and Public Utilities Division.

Appendix IV
(Sheet two of
three sheets)

INTERCITY NET TON MILES PERFORMED BY EACH MODE OF TRANSPORT, AND PERCENTAGE SHARE OF THE MARKET, CANADA, 1938, 1950, 1957, 1964 AND 1965

Year	Rail	Road	Water	Air	Oil Pipelines	Gas Pipelines	Total
			Millions of Net Ton Miles				
1938	26,835	1,515	24,267	1	-	-	52,618
1950	55,538	7,597	27,017	8	610	-	90,770
1957	71,047	10,679	36,657	38	16,507	180	135,108
1964	85,033	18,181	54,164	64	28,027	15,307	200,776
1965	87,190	19,411	55,063	75	29,881	16,955	208,575
			Percentage of Market				
1938	51.0	2.9	46.1	*	-	-	100
1950	61.2	8.4	29.7	*	0.7	-	100
1957	52.6	7.9	27.1	*	12.2	0.2	100
1964	42.4	9.0	27.0	*	14.0	7.6	100
1965	41.8	9.3	26.5	*	14.3	8.1	100

NOTE: * 1/10 of one per cent or less.

For oil and gas pipelines the years 1950 and 1957, respectively, were the first years for which statistics were shown.

SOURCE: D.B.S., Weekly Bulletin, February 17, 1967.

Appendix IV
(Sheet three of
three sheets)

INTERCITY NET TON MILES PERFORMED BY EACH MODE OF TRANSPORT AND PERCENTAGE SHARE OF THE MARKET, CANADA AND UNITED STATES, 1965

Mode of Transport[1]	Canada		United States	
	Ton Miles	Per Cent	Ton Miles	Per Cent
	Millions		Millions	
Rail	87,190	45.5	704,600	42.9
Road	19,411	10.1[2]	370,800	22.5
Water	55,063	28.8	256,000	15.6
Air	75	.0[3]	1,910	.1
Oil Pipelines	29,881	15.6	310,149	18.9
Total	191,620	100.0	1,643,459	100.0

NOTE: 1 Gas pipelines are not included in the United States data. Therefore, gas pipelines have been eliminated from the Canadian data for purposes of comparison.

2 Included in the Canadian data is a small amount for farm trucks. While it is not available separately for 1964 and 1965, in 1963 farm trucks performed 500 million net ton miles.

3 Less than 1/10 of one per cent.

SOURCE: D.B.S., Weekly Bulletin, February 17, 1967; Interstate Commerce Commission, Statement No. 6103, Table I; and Transport Economics, January, 1966 and May, 1966.

Appendix V

DISTRIBUTION OF TRUCK POPULATION DATA FOR 1963, 1964 AND TENTATIVE DATA FOR 1965, CANADA, AND PROPORTIONS OF FOR-HIRE AND PRIVATE INTERCITY TRUCKS AS A PERCENTAGE OF THE TOTAL OF THESE TWO CLASSES

	1963		1964		1965	
Class	Number	Per Cent	Number	Per Cent	Number	Per Cent
For-Hire	60,567	6.1	61,760	6.0	61,615	5.7
Private Intercity	202,711	20.2	219,357	21.2	224,870	21.0
Urban	403,092	40.3	410,365	39.7	434,655	40.5
Farm	334,730	33.4	341,518	33.1	351,660	32.8
Total	1,001,100	100.0	1,033,000	100.0	1,072,800	100.0

	1963		1964		1965	
Class	Number	Per Cent	Number	Per Cent	Number	Per Cent
For-Hire	60,567	23.0	61,760	22.0	61,615	21.5
Private Intercity	202,711	77.0	219,357	78.0	224,870	78.5
Total	263,278	100.0	281,117	100.0	286,485	100.0

SOURCE: D.B.S., Transportation and Public Utilities Division.

Appendix VI

PERCENTAGE DIVISION OF ROAD-RAIL NET TON MILES OF THE ROAD-RAIL MARKET, 1952-1965, AND ROAD-RAIL TONS, 1957-1963, CANADA

Year	Per Cent Road	Per Cent Rail	Total
	Net Ton Miles		
1952	11.5	88.5	100.0
1953	13.0	87.0	100.0
1954	14.2	85.8	100.0
1955	13.5	86.5	100.0
1956	11.8	88.2	100.0
1957	13.0	87.0	100.0
1958	17.5	82.5	100.0
1959	17.5	82.5	100.0
1960	17.4	82.6	100.0
1961	19.7	80.3	100.0
1962	19.6	80.4	100.0
1963	18.0	82.0	100.0
1964	17.6	82.4	100.0
1965	18.2	81.8	100.0
	Tons		
1957	60.6	39.4	100.0
1958	64.5	35.5	100.0
1959	62.9	37.1	100.0
1960	62.6	37.4	100.0
1961	64.9	35.1	100.0
1962	64.8	35.2	100.0
1963	64.4	35.6	100.0

NOTE: Tons are not available on a comparable base for road transport prior to 1957 or after 1963.

SOURCE: D.B.S., Weekly Bulletin, February 17, 1967; D.B.S., Canada Year Book, 1957-1958, 1960 and 1964; D.B.S., Motor Transport Traffic, National Estimates, 1958-1963.

Appendix VII
(Sheet one of
two sheets)

CALCULATION OF THE ANNUAL GEOMETRIC INCREASE IN THE NUMBER OF AGREED CHARGE CONTRACTS, CANADA, 1955-1965

Contracts at Year End

1955 - 95
1965 - 1,610

Use formula	Y	=	ab^x
Where	Y	=	Contracts in effect each year
	a	=	Number of contracts in effect in 1955
	b	=	One plus annual percentage increase expressed in decimals
	x	=	Number of years
Solving for	a:		
	Y	=	ab^x
	95	=	ab^0
	$\therefore a$	=	95
Solving for	b:		
	Y	=	ab^x
Substituting	1,610	=	$95\ b^{10}$
Rearrange	b^{10}	=	$\frac{1,610}{95}$
or	$\log b^{10}$	=	$\log 1,610 - \log 95$
Whence	$\log b$	=	$\frac{\log 1,610 - \log 95}{10}$
	$\log b$	=	$\frac{3.206826 - 1.977724}{10}$
	$\log b$	=	0.122910
	b	=	1.327

Annual geometric increase - 32.7 per cent

SOURCE: The Board of Transport Commissioners for Canada, Annual Reports, Ottawa, 1955 and 1965.

Appendix VII
(Sheet two of
two sheets)

CALCULATION OF THE ANNUAL GEOMETRIC INCREASE IN THE NUMBER OF RAILWAY SHIPPERS USING AGREED CHARGES, CANADA, 1955-1965

Shippers Involved

1955 - 352
1965 - 2,595

Use formula $Y = ab^x$

Where
Y = Number of shippers each year
a = Number of shippers in 1955
b = One plus annual percentage increase expressed in decimals
x = Number of years

Solving for a:

$Y = ab^x$
$352 = ab^0$
$\therefore a = 352$

Solving for b:

$Y = ab^x$

Substituting $2,595 = 352\ b^{10}$

Rearrange $b^{10} = \frac{2,595}{352}$

or $\log b^{10} = \log 2,595 - \log 352$

Whence $\log b = \frac{\log 2,595 - \log 352}{10}$

$\log b = \frac{3.414137 - 2.546543}{10}$

$\log b = 0.0867594$

$b = 1.221$

Annual geometric increase - 22.1 per cent

SOURCE: The Board of Transport Commissioners for Canada, Annual Reports, Ottawa, 1955 and 1965.

Appendix VIII
(Sheet one of
two sheets)

PERCENTAGE DISTRIBUTION OF REVENUE, WAYBILL SAMPLE, BY TYPE OF RATE, CANADIAN RAILWAYS, AT TWO-YEAR INTERVALS, 1954-1964 AND 1965

Type of Rate	1954	1956	1958	1960	1962	1964	1965
				Percentages			
Class Rates	14.8	12.6	10.9	7.6	6.0	4.7	4.6
Commodity Rates:							
Non-Competitive	52.2	43.5	40.1	34.6	32.9	29.6	29.3
Competitive	16.5	22.1	24.0	27.8	27.3	27.3	30.4
Agreed Charges	6.0	10.3	14.3	19.1	22.9	25.2	25.3
Statutory Grain Rates	10.5	11.5	10.7	10.9	10.9	13.2	10.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NOTE: Multiple rates and mixed shipments have been distributed to appropriate categories.

SOURCE: The Board of Transport Commissioners for Canada, Waybill Analysis, Ottawa, 1954-1965.

Appendix VIII
(Sheet two of
two sheets)

FREIGHT REVENUE OF CANADIAN RAILWAYS DISTRIBUTED BY TYPE OF RATE, ACCORDING TO THE WAYBILL SAMPLE PERCENTAGE DISTRIBUTION, AT TWO-YEAR INTERVALS, 1954-1964 AND 1965

Type of Rate	1954	1956	1958	1960	1962	1964	1965	Per Cent Change
				Millions - (Rounded)				
Class Rates	$129	$ 140	$109	$ 76	$ 61	$ 55	$ 56	-57
Commodity Rates:								
Non-Competitive	455	483	400	343	336	346	358	-21
Competitive	144	245	239	276	279	320	372	+158
Agreed Charges	52	114	142	190	233	295	309	+495
Statutory Grain Rates	92	128	106	108	111	154	127	+38
Total Revenue	$872	$1,110	$996	$993	$1,020	$1,170	$1,222	

SOURCE: D.B.S., Railway Financial Statistics, Part II, 1954-1965; and sheet one of this Appendix.

Appendix IX
(Sheet one of
two sheets)

TONS OF GOODS HANDLED BY CANADIAN RAILWAYS, DISTRIBUTED BY COMMODITY GROUPS, TWO-YEAR INTERVALS, 1952-1964 AND 1965

Commodity Group	1952	1954	1956	1958	1960	1962	1964	1965
	Millions							
Agricultural	37.4	28.5	34.8	29.3	26.7	25.2	35.7	30.3
Animals and Animal Products	1.7	2.0	2.1	1.6	1.7	1.5	1.7	1.5
Mine	54.8	51.7	78.4	59.9	65.5	68.2	84.4	91.5
Forest	19.3	16.0	19.0	14.6	15.0	15.5	17.6	18.3
Manufactures and Miscellaneous	48.9	45.0	55.3	48.0	49.6	50.6	59.0	63.6
Total	162.1	143.2	189.6	153.4	158.5	161.0	198.4	205.2

NOTE: According to the D.B.S. Weekly Bulletin, May 5, 1967, total railway tons for 1966 were 213,966,818. This was an increase of 4.3 per cent over 1965. A distribution of the tonnage by commodity was not given.

SOURCE: D.B.S., Canada Year Book, 1957-1958, 1960 and 1964; D.B.S., Railway Freight Traffic, Years Ended December 31, 1964 and 1965.

Appendix IX
(Sheet two of
two sheets)

PERCENTAGE DISTRIBUTION OF RAILWAY CARLOADS BY MAIN COMMODITY GROUPS AND BY TYPE OF RATE, CANADA, 1960 AND 1964

Rate	Agricultural		Animals and Animal Products		Mine	
	1960	1964	1960	1964	1960	1964
Class Rates	1.1	0.9	15.2	11.5	0.4	0.2
Commodity Rates:						
Non-Competitive	15.3	12.7	9.6	25.2	68.8	53.8
Competitive	8.7	11.4	69.8	52.5	25.4	15.4
Agreed Charges	6.9	5.5	5.4	10.8	5.4	30.6
Statutory Grain Rates	68.0	69.5	-	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0

Rate	Forest		Manufactures and Miscellaneous		Total	
	1960	1964	1960	1964	1960	1964
Class Rates	0.3	1.0	6.1	5.1	3.1	2.7
Commodity Rates:						
Non-Competitive	51.8	28.8	17.6	15.0	35.4	25.2
Competitive	26.2	38.6	36.9	42.0	28.0	28.6
Agreed Charges	21.7	31.6	39.4	37.6	20.7	27.2
Statutory Grain Rates	-	-	-	0.3	12.8	16.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

NOTE: This was a special study for the writer, dated June 27, 1966, made by The Board of Transport Commissioners for Canada, Ottawa. This study is based on carloads, which is not as precise as tons, but it indicates the situation. Because of technical difficulties regarding multiple and mixed shipments, 1960 was the earliest year which could be exactly comparable with later years.

Appendix X

REVENUE PER TON MILE, RAIL AND ROAD TRANSPORT, CANADA, YEARS AS SHOWN

Year	Rail		Road	
	Cents	Index	Cents	Index
1949	1.26	100	N/A	-
1950	1.39	110	N/A	-
1951	1.36	108	N/A	-
1952	1.38	109	N/A	-
1953	1.49	118	N/A	-
1954	1.52	121	N/A	-
1955	1.46	116	N/A	-
1956	1.41	112	N/A	-
1957	1.52	121	7.3	100
1958	1.50	119	6.8	93
1959	1.56	124	6.4	88
1960	1.52	121	6.6	90
1961	1.54	122	6.2	85
1962	1.50	119	6.3	86
1963	1.41	112	6.8	93
1964	1.40	111	N/A*	-
1965	1.48	117	N/A	-

NOTE: * Not available on a comparable base to previous years.

SOURCE: D.B.S., Canada Year Book, 1959, p. 781; 1963-1964, p. 761; 1965, p. 766; The Board of Transport Commissioners for Canada, Waybill Analysis, 1964, p. 3; 1965, p. 3; D.B.S., Motor Transport Traffic, National Estimates, 1958-1963.

Appendix XI

ANNUAL ROAD EXPENDITURES IN MILLIONS OF DOLLARS, BY ALL LEVELS OF GOVERNMENTS, AND ANNUAL MOTOR VEHICLE REVENUES, ALL SOURCES, CANADA, 1949-1965

Year	Total Road Expenditures	Motor Vehicle Revenues - All Sources		Expenditures Over Revenues	Per Cent of Total Expenditures
		Fuel Taxes	Licenses		
1949	$ 319.1	$ 137.8	$ 58.2	$ 123.1	38.5
1950	331.0	155.1	67.2	108.7	32.8
1951	399.4	178.5	73.7	147.2	36.8
1952	475.6	196.9	81.1	197.6	41.5
1953	480.1	219.9	87.8	172.4	35.9
1954	522.5	235.7	93.8	193.0	36.9
1955	624.9	264.4	113.5	247.0	39.5
1956	783.3	295.0	127.8	360.5	46.0
1957	862.2	340.7	139.6	381.9	44.2
1958	937.0	358.4	146.0	432.6	46.2
1959	1,021.0	376.2	162.1	482.7	47.3
1960	1,067.3	396.2	172.2	498.9	46.7
1961	989.0	441.6	183.0	364.4	36.8
1962	1,031.5	475.5	189.9	366.1	35.5
1963	1,212.6	530.3	211.1	471.2	38.9
1964	1,383.6	606.5	225.2	551.9	39.9
1965	1,585.4	672.0	245.7	667.7	42.1
Total	$14,025.5	$5,880.7	$2,377.9	$5,766.9	41.1

SOURCE: D.B.S., Road and Street Mileage and Expenditures, 1963, p. 13, and 1965, p. 8; D.B.S., The Motor Vehicle, Part IV, 1964, p. 7, and 1965, p. 7.

Appendix XII

ARC AND POINT ELASTICITY

Elasticity may be measured over a portion of the demand curve, i.e., between two points on the curve. This is referred to as arc elasticity. It may also be measured at one point on the curve, which is point elasticity. This can be measured geometrically as shown in the Leftwich text (see reference below). While point elasticity results in the same elasticity coefficient for price increase or decrease, arc elasticity can result in different coefficients, depending on whether price is increased or decreased. For example, a different coefficient could result from an increase in the price of sugar from 15 cents a pound to 17 cents, to that of a decrease in price from 17 cents a pound to 15 cents. Thus the formula:

$$E = \frac{\Delta Q}{Q} \div \frac{\Delta P}{P}$$

is not completely adequate to measure arc elasticity. It is necessary to take an average between the two points involved on the curve. Thus the formula:

$$E = \frac{Q_1 - Q_2}{Q_1 + Q_2} \div \frac{P_1 - P_2}{P_1 + P_2}$$

may be used. This formula may also be written:

$$E = \frac{\Delta Q}{Q_1 + Q_2} \div \frac{\Delta P}{P_1 + P_2}$$

This formula expresses the change in quantity, divided by the sum of quantity one and quantity two, divided by the change in price, divided by the sum of price one and price two. The elasticity is averaged over the arc.

For a discussion of the subject see:

Donald S. Watson, "Price Theory and Its Uses" (Boston: Houghton Mifflin Company), 1963, pp. 30-39.

Richard H. Leftwich, "The Price System and Resource Allocation" (Toronto: Holt, Rinehart and Winston), 3rd. ed., 1966, pp. 33-45.

Appendix XIII
(Sheet one of
two sheets)

LONG-RUN MARGINAL COSTS BY DISTANCE, RAIL BOXCAR AND TRUCK, UNITED STATES, FOR THE PERIOD 1952-1955

Distance	Truck	Rail Costs	Service Differential	Total Rail Costs
Miles	Cents Per Ton Mile			
50	8.80	6.88	3.12	9.94*
100	6.00	3.60	1.72	5.32
200	4.80	1.96	0.98	2.94
400	3.85	1.15	0.63	1.78
600	3.27	0.86	0.53	1.39
800	3.24	0.72	0.43	1.15

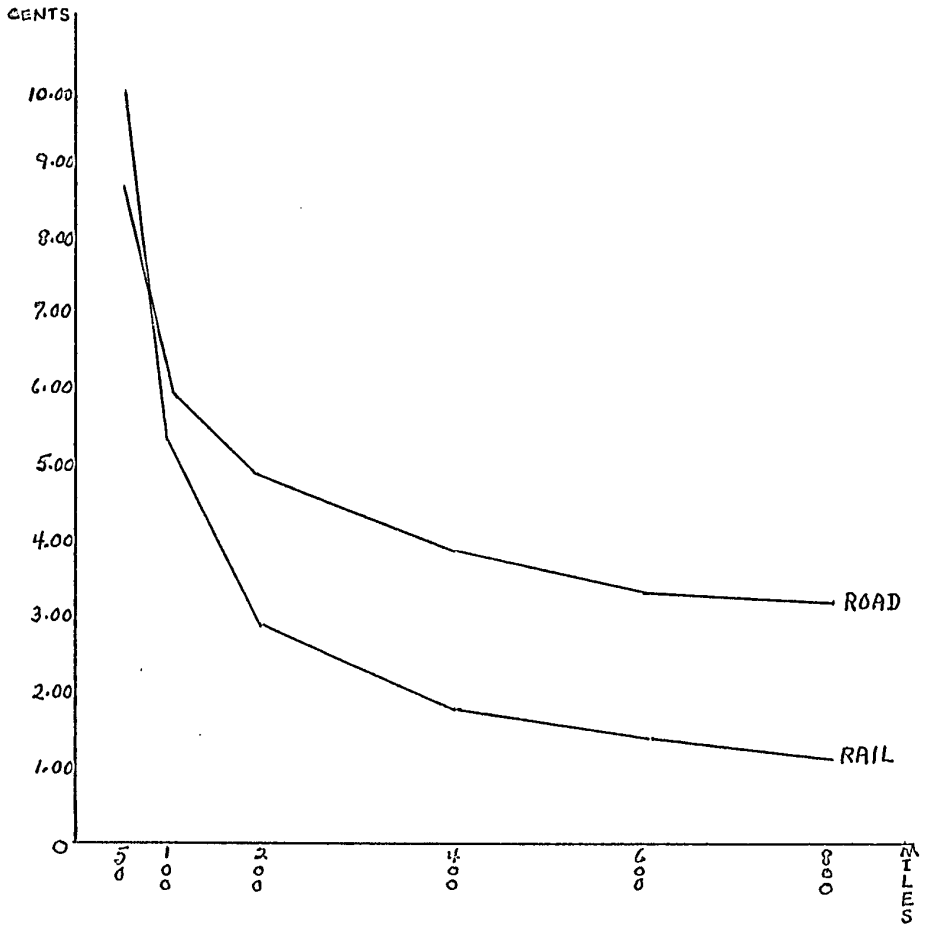
NOTE: * In the original these figures are out 0.06 cents.

The above table is depicted in Chart II, sheet two, of this Appendix.

SOURCE: John R. Meyers and others, "The Economics of Competition in the Transportation Industries" (Cambridge, Mass.: Harvard University Press), 1959, p. 190.

CHART II

Long-Run Marginal Costs, Rail Boxcar and Truck,
by Distance, United States, Period 1952-1955



See Sheet One of this Appendix for Data

Appendix XIV
(Sheet one of
three sheets)

AVERAGE DISTANCES AND REVENUE PER TON MILE FOR MAJOR CATEGORIES OF COMMODITIES MOVED BY ROAD AND RAIL TRANSPORT, CANADA, 1963

		Road	Rail
Food, Feed, Beverages and Tobacco			
Average Distances (Miles):			
Low	-	40	51
Average	-	95	761
High	-	780	3,199
Revenue Per Ton Mile (Cents)	-	5.1	0.84
Number of Times Rail Greater Than Road Average Distance	-	8	
Livestock			
Average Distances (Miles):			
Low	-	40	92
Average	-	104	1,017
High	-	120	3,104
Revenue Per Ton Mile (Cents)	-	8.0	2.7
Number of Times Rail Greater Than Road Average Distance	-	9.8	

Appendix XIV
(Sheet two of
three sheets)

		Road		Rail
Crude Materials				
Average Distances (Miles):				
Low	-	10		16
Average	-	15		205
High	-	320		3,479
Revenue Per Ton Mile (Cents)	-	6.1		1.2
Number of Times Rail Greater Than Road Average Distance	-		13.6	
Manufactured Goods (Inedible)				
Average Distances (Miles):				
Low	-	20		4
Average	-	83		540
High	-	280		2,993
Revenue Per Ton Mile (Cents)	-	6.8		2.4
Number of Times Rail Greater Than Road Average Distance	-		6.5	

SOURCE:

Road Data: D.B.S., Motor Transport Traffic by Commodities, Second and Third Quarters, 1963.

Rail Data: The Board of Transport Commissioners for Canada, Waybill Analysis, 1963.

Appendix XIV
(Sheet three of
three sheets)

COMMENTS ON DISTANCES COMMODITIES ARE CARRIED BY ROAD AND RAIL TRANSPORT IN THE UNITED STATES

The following comments, which would agree with the foregoing data, were extracted from the work of Marvin L. Fair and Ernest W. Williams, Jr.:

> ...bituminous coal is seldom hauled more than 75 miles by truck, it moves 450 miles or more by rail; anthracite, a more valuable commodity, may move as much as 130 miles by truck, but it moves beyond 600 miles by rail; iron and steel sixth class, which includes ingots, pigs, slabs, blooms, and billets may move beyond 200 miles by truck, but by rail it will sometimes move to distances exceeding 1,000 miles; iron and steel fifth class, which is more valuable per ton and includes such primary mill shapes as shot, plate, and structurals, will move up to 350-400 miles by truck and almost limitless distances by rail; finally, high-class articles rated second class and above are capable of moving up to full transcontinental hauls by either rail or truck.

SOURCE: Marvin L. Fair and Ernest W. Williams, Jr., "Economics of Transportation" (New York: Harper and Brothers), Rev. Edition, 1959, p. 334.

Appendix XV
(Sheet one of
four sheets)

DISTRIBUTION OF TONS OF GOODS HANDLED BY ROAD AND RAIL TRANSPORT, CANADA, 1963

	Road	Rail
High-Valued Commodities:		
Food, Feed, Beverages and Tobacco	34,015,000	66,400,000
Livestock	2,714,000	500,000
Manufactured Goods (Inedible)	127,385,000	49,200,000
Total	164,114,000	116,100,000
Ratio Road to Rail:	1.4:1	
Low-Valued Commodities:		
Crude Materials	146,120,000	78,400,000
Ratio Road to Rail:	1.9:1	

SOURCE:

Road Data: D.B.S., Motor Transport Traffic, National Estimates, 1963.

Rail Data: D.B.S., Railway Freight Traffic, For the Year Ended December 31, 1963.

Appendix XV
(Sheet two of
four sheets)

AVERAGE DISTANCES TONS OF HIGH- AND LOW-VALUED COMMODITIES WERE CARRIED BY ROAD TRANSPORT, CANADA, 1963

High-Valued Commodities:

Average Distance	Per Cent	Tons
Up to 100 miles	58.2	95,500,000
100 to 200 miles	40.3	66,200,000
Over 200 miles	1.5	2,414,000
Total	100.0	164,114,000

Low-Valued Commodities:

Average Distance	Per Cent	Tons
Up to 100 miles	98.1	143,340,000
100 miles and over	1.9	2,780,000
Total	100.0	146,120,000

NOTE: While a small amount of grain was handled by intercity trucks it was included with cereals and, thus, it was not possible to separate these various commodities in the food, feed, beverages and tobacco category. It has been included in the high-valued group. However, the bias would be insignificant.

The distribution by average distance has been arrived at by tabulating, on a distance basis, tons of individual commodities shown in the Motor Transport Traffic quarterly publication. After the percentage distribution was arrived at it was applied to the total tonnage.

Because of the large amount of very short-haul traffic there is a tendency for average distance to be reduced to fairly low levels. Nevertheless, even for trips over fifty miles, for the high-valued groups of commodities, only two commodities averaged more than 400

miles - tobacco, 440 miles, and meat and meat preparations, 780 miles. Four commodities averaged 300 or more miles - fruit, 320 miles, vegetables, 320 miles, miscellaneous food, 360 miles, and inedible end products, 300 miles. The other twenty-six commodities averaged from seventy miles up to 290 miles.

SOURCE: The tonnage data is taken from sheet one of this Appendix and average distance distribution from D.B.S., Motor Transport Traffic by Commodities, Second and Third Quarters, 1963.

Appendix XV
(Sheet four of
four sheets)

AVERAGE DISTANCES TONS OF HIGH- AND LOW-VALUED COMMODITIES WERE CARRIED BY RAIL TRANSPORT, CANADA, 1963

High-Valued Commodities:

Average Distance	Per Cent	Tons
Up to 100 miles	2.1	2,438,100
100 to 200 miles	18.3	21,246,300
200 to 400 miles	16.9	19,620,900
Over 400 miles	62.7	72,794,700
Total	100.0	116,100,000

Low-Valued Commodities:

Average Distance	Per Cent	Tons
Up to 100 miles	22.8	17,875,200
100 to 200 miles	24.7	19,364,800
200 to 400 miles	7.3	5,723,200
Over 400 miles	45.2	35,436,800
Total	100.0	78,400,000

NOTE: Commodities moving under statutory grain rates are included in the low-valued group.

To arrive at the percentage distribution, the tonnages of high-valued and low-valued commodities were tabulated on an average distance basis as shown in the Waybill Analysis. The percentage figures were then applied to total tons.

SOURCE: The tonnage data is taken from sheet one of this Appendix and average distance data from The Board of Transport Commissioners for Canada, Waybill Analysis, 1963 and 1964.

Appendix XVI
(Sheet one of
three sheets)

INTERVIEWS

Certain Vancouver companies were approached to ascertain their shipping patterns. Following were the findings:

MacMillan Bloedel, Ltd.:

MacMillan Bloedel manufactures wood products. An agreed charge was signed with the railways to ship ninety per cent of their plywood, shingles, particle board and similar products by rail. One hundred per cent of their newsprint is shipped by rail. Most of the local shipments, say, from 200 to 300 miles, are taken by truck and some shipments are made by truck as far as Winnipeg. However, on an interprovincial basis, only ten per cent moves by truck.

Following is a comparison of rail and road freight rates. While a truck rate is shown for Toronto, very seldom, if ever, is road transport used for such shipments.

	Rail	Road
	Rate Per Hundred Pounds	
Vancouver to:		
Calgary	$0.72	$0.80
Edmonton	0.85	0.90
Regina	1.15	1.20
Winnipeg	1.49	1.53
Toronto	1.64	1.74
Saint John, N.B.	1.72	-

These rail rates apply for 40,000 pounds. See page two of this Appendix for volume discounts.

Road shipments are limited to a maximum of 44,000 pounds.

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(Sheet two of
three sheets)

For the above rail rates the following volume discounts are effective:

Vancouver to:

Calgary)
Edmonton)
Regina)

Pounds	Cent Reduction Per Hundred Pounds
50,000	2
60,000	2
70,000	3
80,000	3
90,000	2
100,000	2

Vancouver to:

Winnipeg)
Toronto)
Saint John, N.B.)

50,000	8
60,000	2
70,000	3
80,000	4
90,000	2
100,000	2

Appendix XVI
(Sheet three of
three sheets)

B.C. Sugar Company, Ltd.:

This Company manufactures all types of sugar and sugar products. From Vancouver, it ships yellow and fancy sugars as far east as Manitoba. Primarily this Company ships by rail. The traffic manager does not have truck rates available. Following are the rail rates, which are under an agreed charge:

		Rail Rate Per Hundred Pounds
Vancouver to:		
Calgary	-	$0.96
Edmonton	-	0.96
Regina	-	1.53
Winnipeg	-	1.65

The T. Eaton Company, Ltd., The Hudson's Bay Company, Woodward's, Ltd., and Eleven Other Companies:

These fourteen companies have a pool car arrangement under which an agreed charge was signed. The rates were not made available to the writer, but it was stated that the trucking operations do not even bid on the traffic moving from Eastern Canada to Western Canada. The merchandise all moves by rail.

For distribution of merchandise in British Columbia, Alaska, the Yukon and the North West Territories road transport is used to a large extent.

Appendix XVII

TRANS-CANADA HIGHWAY ROAD MILEAGES

Windsor, Ontario to Victoria, B.C.:

		Trip Miles	Cumulative Total Miles
Windsor to London	-	120	120
London to Toronto	-	124	244
Toronto to Sudbury	-	244	488
Sudbury to Fort William	-	626	1,114
Fort William to Winnipeg	-	437	1,551
Winnipeg to Regina	-	358	1,909
Regina to Calgary	-	470	2,379
Calgary to Vancouver	-	675	3,054
Vancouver to Victoria	-	70	3,124

Windsor, Ontario to Halifax, N.S.:

Windsor to Montreal	-	560	560
Montreal to Halifax	-	844	1,404

Trips Between the Toronto-London Area and the Winnipeg-Calgary Area:

Between 1,307 miles and 2,259 miles.

SOURCE: The above mileages have been extracted from road maps which are produced by Rolph-Clark-Stone, Limited, Toronto, for Texaco Company of Canada, Limited, and Shell Oil Company of Canada.

Appendix XVIII
(Sheet one of
fifteen sheets)

A BRIEF OUTLINE ON THE MACPHERSON ROYAL COMMISSION AND SUBSEQUENT GOVERNMENT ACTION

INTRODUCTION

In the post-war period a number of labour dispute settlements and material price increases resulted in considerable increased expense for the railways. Following these settlements, horizontal or across-the-board freight rate increases were put into effect. In the fall of 1958, a non-operating employees' labour settlement was effected. To meet the cost of this and other settlements, a seventeen per cent freight rate increase was authorized.[1] The Western and Maritime Provinces appealed the increase to the Governor in Council. The appeal was dismissed but on November 26, 1958, the Federal Government indicated its intention to have the subject of freight rates reviewed.

A freight rate "freeze" was imposed on March 24, 1959,[2] and on May 13, 1959, the MacPherson Royal Commission was appointed to investigate railway matters.[3] In July of that same year the Freight Rates Reduction Act was passed.[4] Its purpose was to reduce the seventeen per cent freight rate increase to ten per cent, with the difference being borne by the Federal Government. In April 1960 the Government's portion was increased from seven to nine per cent.[5] The Commission's report comprised three volumes. They were released in 1961 and 1962.

PRINCIPLES

Four sound principles were used by the MacPherson Commission when making its recommendations. First, that there should be a minimum of regulation, applied equally to all forms of transport. Second, that there should be a rationalization of rail plant and services. Any uneconomic service continued in the public interest should be paid for from public funds. Third, that no form of transport should be singled out for national policy and, if so, sufficient compensation should be advanced to that mode of transport to prevent any upset in the competitive transportation market. Fourth, any subsidy

paid to assist a shipper or region should be applicable to all forms of transport, and not disguised as a subsidy to transportation.[6] These principles had as their objective the use of competition to the greatest extent possible for governing transportation services and the treating of all modes of transport in the same manner.

RECOMMENDATIONS

The following were the main recommendations made by the Commission.

Branch Line Abandonments

The Commission stated that there should be a rationalization of rail plant. One excerpt from the Commission's report is as follows:

> ...it is apparent that the nation must now face the fact that the railway branch line networks are no longer vital to either the well-being of the communities on the branch line or the larger society....[7]

Using Canadian National Railway data for the period 1956-1959, the Commission found that branch lines comprised forty per cent of trackage but contributed only 4.4 per cent of gross ton miles. From data available it was concluded that the same pattern existed on the Canadian Pacific Railway. The Commission considered a line with less than 100,000 net ton miles or 200,000 gross ton miles per mile of track per year would lose money. Managements of the two large railways said there were about 8,600 such miles of track - about 4,300 on each railway.

The Commission stated that in 1958, maintenance of 8,600 miles of track would cost $13.0 million annually. The recommendation was made that an annual grant of $13.0 million be provided to compensate the railways for losses incurred on lines in operation which they planned to abandon but which the Board of Transport Commissioners felt should be continued for a period of time. A rationalization plan was set out by the Commission and the adjustment period recommended was fifteen years.[8]

Appendix XVIII
(Sheet three of
fifteen sheets)

Uneconomic Passenger Services; Non-Compensatory Statutory Grain Rates; and Statutory Free Transportation

Passenger Services. The MacPherson Commission pointed out that the private automobile, the bus and the aeroplane had made inroads on railway passenger service. It stated:

> ...sufficient evidence was brought before us to make it abundantly clear that the competition for passenger business from airlines, bus lines and private passenger cars has rendered the railway passenger business as a whole unprofitable and a burden which at present must be borne by the users of rail freight services....[9]

and

> ...Therefore, our conclusion is that the railways must eventually withdraw all uneconomic rail passenger services, subject to...time limitations...[10]

Railway managements felt a five-year adjustment period was necessary. The Commission made a recommendation of maximum payments on behalf of uneconomic passenger service ranging from $62.0 million in the first year to $12.4 million by the fifth year.[11]

Statutory Grain Rates. After extensive studies on statutory grain rates, the Commission concluded that an economic burden was being placed on the railways because of the fact that statutory grain rates were not compensatory. It was found that in 1958 there was a short-fall of revenue under variable costs of about $6.0 million. Further, it recommended that a reasonable contribution to constant cost, by the Federal Government, would be $16.3 million.[12]

Statutory Free Transportation. It was suggested by the Commission that the railways be compensated for any statutory free transportation which the law compelled them to provide.[13]

Appendix XVIII
(Sheet four of
fifteen sheets)

Railway Rate Control

For greater flexibility in rail rate-making, the MacPherson Commission recommended that rail rates be effective on the date which they are filed with the Board. It was also recommended that the regulatory authority should be charged with the responsibility of controlling the upper and lower limits of railway rates, aided by the most efficient costing section possible.[14]

Minimum Rates. The Commission felt that the minimum rate level for all modes of transport should be the long-run marginal cost - the cost for an additional unit of service over a sufficiently long period of time, which would allow management to adjust plant and investment to the requirements of the movement.[15] In regard to railway minimum rates, the Commission stated that out-of-pocket (direct) cost should be the minimum level because the railways are only able to adjust very slowly and a competitive environment is desired. In relation to minimum truck rates it was felt that competition would control the situation.[16]

Maximum Rates. While it was recommended that competition should exist to the greatest extent possible, it was recognized that there were still some captive shippers on the railways or, in other words, areas of significant monopoly existing. It was felt that in such situations rate control was necessary to protect the shipper.[17]

For maximum rate control, it was recommended that such rates be based on the long-run variable cost as determined by the Board of Transport Commissioners plus 150 per cent of such cost. A weight of 30,000 pounds was judged to be the key weight upon which to base a maximum rate because this would be the weight of the unit load of the truck for its optimum rate. Because the truck had been the instrument which had eroded away the rail monopoly, it was felt the 30,000 pound weight would be reasonable. The Commission stated the Board would have to constantly review its definition of variable cost in the light of changing conditions. The decision to have captive shipper status applied would be undertaken only after application was made by the shipper. It would be necessary for him to follow the procedure outlined in order to make his claim.[18]

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For maximum rate control of trucks the Commission felt that there should be a concentration upon regulation of truck operations, based upon the best knowledge possible, and with freedom of entry into the Industry. It was felt that a competitive environment would result which would provide service, with a normal return to the investor and also the necessary control.[19]

Maritime Freight Rates Act

The MacPherson Commission recommended that, except for Newfoundland, intra-Maritime subsidies paid under the Maritime Freight Rates Act be eliminated as it was the original intention to expand the market outside the Maritimes and the intra-Maritime subsidy was not accomplishing the original objective.

It will be noted from the information below that in the year 1965 about seventy-five per cent of railway carload traffic was intra-Maritime traffic.

DESTINATION REGIONS OF CARLOAD TRAFFIC ORIGINATING IN THE MARITIMES, AND CLASSES OF RATES INVOLVED, CANADA, 1965

Rate	Destination Region			
	Maritime	Central	Western	Total
Class	67	41	-	108
Commodity:				
Non-Competitive	813	266	5	1,084
Competitive	741	108	1	850
Agreed Charges	585	304	8	897
Statutory	-	-	-	-
Total	2, 206	719	14	2,939

SOURCE: The Board of Transport Commissioners for Canada, Waybill Analysis, 1965.

It was also recommended that those rate reductions made on traffic moving out of the Maritimes should apply to traffic transported by all modes of transport. It was considered that this was a device to aid the Maritime shippers and not the railways. Thus it was held that the shipper should have access to any mode of transport and still receive the benefit of the subsidy.[20]

East-West "Bridge" Subsidy

The "Bridge" Subsidy, which was a payment by the Federal Government for the reduction of freight rates on traffic (both ways) over Northern Ontario, amounted to $7.0 million annually. It was conceived to lessen the burden of the east and west long-hauls of freight for the Western Provinces.

The Commission stated that this subsidy discriminated against water and road transport, giving rail an advantage; that the subsidy applied only to class and non-competitive commodity rates; that it discriminated against other regions such as British Columbia; and that substantial economic growth had been evidenced in the Northern Ontario region since the subsidy was instituted. It was felt that the subsidy should be abolished.[21]

Freight Rates Reduction Act

It was recommended that the "roll-back" subsidy of $20.0 million annually under the Freight Rates Reduction Act should be eliminated and the rates then presently effective for the shippers should stand. The subsidy was a manifestation of public policy burdens of another era which were placed on the railways. The burdens were to be alleviated by other recommended subsidies.[22]

Feed Freight Assistance

The movement of feed grains and certain other feed products from the Prairie Provinces to Eastern Canada and British Columbia was receiving a Federal subsidy to assist in their transportation.

Under Order in Council P.C. 8067, of October 20, 1941, the subsidy was commenced for freight assistance on wheat, oats, barley, rye, bran, shorts, middlings and No. 1 and No. 2 feed screenings, transported by rail or boat from Port Arthur, Fort William or Armstrong to Eastern Canadian destinations, if feed were used for livestock or poultry before July 1, of the following year. Payment was $4.50 a ton from the Lakehead to just east of Montreal. East of that, the rate was higher. Under Order in Council P.C. 1958-1628, November 27, 1958, the assistance was extended to British Columbia. The payment is made from the Appropriation Fund and is paid directly to the millers, being passed on to the consumer in the form of lower prices.

In 1961 the Feed Freight Assistance Subsidy totalled $19.0 million. Approximately $17.3 million was paid to feed dealers in the six Eastern Provinces and $1.8 million to dealers in British Columbia.[23]

One of the major criticisms levelled by the Commission was that the feed grain assistance did not apply to grain transported by trucks. Thus trucking was being placed at a disadvantage from a competitive point of view. Recently the feed freight assistance was extended to shipments of feed grain transported by truck in Eastern Canada. This does not, however, apply to trucks in Western Canada. The Canadian Trucking Associations, Inc., felt that the Canadian Wheat Board was the obstacle as it was afraid that application of the subsidy to trucks would jeopardize grain marketing schemes.[24]

Other Recommendations

Some additional recommendations were, first, that provincial regulation of trucking in regard to safety and performance be coordinated and that full freedom of entry of firms into the trucking industry be facilitated. Second, a national transportation advisory council and an improvement in transportation statistics were recommended. Third, there was developmental assistance recommended for Newfoundland, in the form of highways and bulk grain storage facilities. Fourth, it was recommended that there be a freedom of entry of the railways into the trucking industry.[25]

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BILL C-120

While the MacPherson Commission report was handed down in 1961, because of a change in government and other attendant problems, Bill C-120,[26] a Bill to implement some of the major recommendations, was not introduced by the Minister of Transport until September 14, 1964.

In February 1965, the Honourable J.W. Pickersgill, Minister of Transport, in referring to Bill C-120 before the Standing Committee on Railways, Canals and Telegraph Lines, said that after first reading of the Bill in 1964, it appeared that little progress would be made in the Summer and Fall of 1964. He said he had discussed the subject with a "number of parties" and the second reading and debate were dispensed with. He stated that the Bill was "technically killed" by an amendment and, thus, it had been sent to the Standing Committee. The purpose was to hear representations from the public. He further said that a new bill would be presented in the next session of Parliament and he was mainly interested in obtaining ideas. The Minister also stated that in drawing up the Bill, the Commission's recommendations were broadly accepted with a few modifications.[27] The four main subjects of the Bill were railway pricing, statutory grain rates, passenger service and rail branch line abandonments.[28]

Bill C-120 contained the following main recommendations made by the Commission. First, that $13.0 million a year be set aside for fifteen years to compensate the railways for uneconomic branch lines. Second, that passenger train service subsidies, as set out in the Commission's report, be paid to the Canadian Pacific Railway and Canadian National Railways during the five-year adjustment period. Also, passenger subsidies were added for other railways. Third, that yearly payments be made on behalf of statutory grain rate traffic to the extent of any deficiency in variable cost and $7.3 million and $9.0 million be paid to Canadian National and Canadian Pacific, respectively, on behalf of constant cost.[29]

For minimum rate control the provision was made that all rates should be compensatory. A compensatory rate was considered one which would exceed the variable cost of the movement of traffic as determined by the Board. While the Commission recommended out-of-pocket costs as the minimum rate level, Bill C-120 was very broad

in stating that all items and factors as prescribed by the regulations of the Board would be relevant in the determination of variable cost. Cost of capital was to be based on the cost of capital to the Canadian Pacific Railway.[30] The established rate level was to be that of the rates in effect under the Freight Rates Reduction Act.[31]

For maximum rate control the broad principle of the Commission's recommendation was adopted, i.e., variable cost plus 150 per cent of the variable cost. It was confined, however, to only those shippers who would have no other means of transport available. Under the Commission's recommendation any captive shipper, even in a competitive territory, could apply and receive captive status. Also for weights of 40,000 or more pounds in a carload, an increasing percentage reduction on a graduated scale was to be applicable to variable cost.[32]

There was provision in Bill C-120 for trucking companies to receive piggyback rates equal to those of railway trucking companies and also a provision for the elimination of the "Bridge" Subsidy. In addition, the Maritime Freight Rates Act was to be extended, rates were to be compensatory for Government mail and protective forces, and the Canadian National-Canadian Pacific Act was to be repealed.[33]

BILL C-231

On August 29, 1966, the Honourable Mr. Pickersgill introduced Bill C-231 in a second attempt to implement the major portion of the MacPherson Commission's recommendations and also to set up an overall body of control for extra-provincial transport.

The Bill was referred to Special Committee. After hearings of interested parties, debate in the House of Commons, and after certain amendments were made, the Bill was passed by the House on January 27, 1967. It received Royal Assent on February 9, 1967. The Act is referred to as the National Transportation Act and is entitled:

> An Act to define and implement a national transportation policy for Canada, to amend the Railway Act and other Acts in consequence thereof and to enact other consequential provisions.[34]

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fifteen sheets)

The main objective of the new Act is to set up a national transportation policy which will make the most efficient use of each mode of transport at the least possible cost to the nation.

The body of control set up under the Act is to be called the Canadian Transport Commission. It is to be composed of not more than seventeen members, appointed by the Governor in Council. Provision is made to merge the present three bodies which control rail, air and water transport.[35]

The Act provides for the new Commission to control interprovincial rail, air, water, and commodity pipelines, other than those transporting oil and gas. There is also provision for control of motor transport in extra-provincial service should the Governor in Council decide that such action is desirable.[36] This subject is dealt with in Chapter V, and suggestions relating thereto, which were advanced by the Canadian Trucking Associations, are shown in Appendix XXII.

While the legislation provides for implementation of branch line abandonments,[37] elimination of uneconomic passenger services,[38] and maintenance of statutory rates on export grain and grain products,[39] particular subsidies are not attached to these items as was the case in Bill C-120. Rather, an overall subsidy to the railways is provided to ensure that they will not be worse off than they were previously when maintaining reduced levels of freight rates. Payment is provided on the following basis:[40]

Year	Amount Millions
1967	$110
1968	96
1969	82
1970	68
1971	54
1972	40
1973	26
1974	12
Total	$488

The Act provides that in any one year the railways will be paid either the overall subsidy or the sum of the specific subsidies, whichever is larger.

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There is provision in the Act for payment of losses on uneconomic branch lines and uneconomic passenger services, as well as for export grain losses, which are suffered because of the desire of the Government to continue such services after the subsidy is phazed out.[41]

The new legislation contains fairly detailed procedures for branch line abandonment and elimination of uneconomic passenger services.[42] Under branch line abandonment there is a provision for the grouping of branch lines for abandonment purposes, rather than considering lines separately.[43] There is also provision for cooperative procedures for branch line use between railways when the Commission feels that such action would be beneficial.[44] If a railway claims that a branch line is uneconomic and the Commission holds the opinion that the line should be continued, there is provision for the continuing periodic review of such situations.[45]

Under Bill C-120, there was a stipulation that a Branch Line Authority and Branch Line Rationalization Fund be set up. These items do not appear in the new legislation.

In the general tariff provisions, the legislation states that all freight rates shall be compensatory. The guide for a compensatory rate is the variable cost of the movement of traffic concerned as determined by the Commission. In computing the cost, the cost of capital used is that which is considered proper for the Canadian Pacific Railway.[46] This provision is the same as that set out in Bill C-120.

For maximum rate control, the procedure would be essentially the same as under Bill C-120. For a captive shipper, the maximum rate as determined by the Commission would be variable cost plus 150 per cent. If a shipper desires to have such a rate set, he must sign a contract for one year. However, for experimental purposes, the Commission has the right to authorize from time to time shipment by other modes of transport. The fixed rate is to be based on a minimum of 30,000 pounds, with a reduction in the rate based on 20,000 pound increases added to the 30,000 pound minimum carload rate.[47] In Bill C-120 the first reduction occurred at 40,000 pounds rather than at 50,000 pounds. The Act provides that

the provisions of the maximum rate section do not apply until a freight rate rises above the rate payable by shippers on August 1, 1966. Subsection eleven, which embodies this section, expires after three years from its implementation, unless extended by the Governor in Council.[48]

Some of the other more important matters covered in the Act relate to Government mail and protective forces being transported at compensatory rates;[49] cessation of the "Bridge" Subsidy, with rates to be increased on a three-step annual basis, and expiration of this section of the Act after four years;[50] provision for continuation of the Maritime Freight Rates Act;[51] repeal of the Canadian National-Canadian Pacific Act;[52] provision for the inclusion of the Board of Transport Commissioners, the Air Transport Board and the Canadian Maritime Commission in the new Canadian Transport Commission, with certain transitional provisions;[53] necessary amendments to thirteen Acts, with the repeal of the Canadian Maritime Commission Act;[54] the transfer of control of bridges from the Board of Transport Commissioners to the Department of Public Works;[55] and provision for trucking companies to receive the same piggyback rates as railway-owned trucking lines.[56]

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FOOTNOTES FOR APPENDIX XVIII

1 The Board of Transport Commissioners for Canada, Judgment and Order, Volume XLVIII (Ottawa: Queen's Printer, November 17, 1958).

2 Hansard, Second Session, 24th Parliament (Ottawa: Queen's Printer), March 24, 1959, p. 2208.

3 P.C. Order in Council 1959-577, May 13, 1959.

4 7-8 Elizabeth II., Chapter 27.

5 The Board of Transport Commissioners for Canada, Order No. 101055 (Ottawa: Queen's Printer, April 27, 1960).

6 MacPherson Royal Commission Report, Op. cit., Volume I, p. 29.

7 Ibid., p. 39.

8 Ibid., Volume I, pp. 61-62; and Volume II, pp. 137-144.

9 Ibid., Volume I, p. 45.

10 Ibid.

11 Ibid., pp. 64-66.

12 Ibid., p. 62.

13 Ibid., p. 52.

14 Ibid., Volume II, pp. 64-65.

15 Ibid., p. 67.

16 Ibid., p. 70.

17 Ibid., pp. 83-97.

18 Ibid., pp. 100-104.

19 Ibid., pp. 113-115.

20 Ibid., pp. 203-215.

21 Ibid., pp. 220-230.

22 Ibid., pp. 111-112.

23 Ibid., pp. 236 and 247.

24 "Submission to Government of Canada on National Transportation Policy," Canadian Trucking Associations, Inc., Op. cit., January, 1965, pp. 16-17.

25 MacPherson Royal Commission Report, Op. cit. These recommendations may be found in Volume II, pp. 70-71, 162 and 267, respectively.

26 It was entitled, "An Act to amend the Railway Act, the Transport Act and the Canadian National Railways Act, and to repeal the Canadian National-Canadian Pacific Act." (Second Session, 26th Parliament, 1964).

27 Standing Committee on Railways, Canals and Telegraph Lines, Op. cit., Minutes of Proceeding and Evidence No. 12, February 12, 1965, pp. 745-746.

28 Mr. H.J. Darling, Director of Economic Studies, Department of Transport, explained to the Standing Committee the provisions regarding pricing and statutory grain rates. Mr. R.R. Cope, Director of Railways and Highways Branch, discussed passenger service and branch line abandonment.

29 See pages 10, 12, 13, 18 and 19 of Bill C-120.

30 Ibid., p. 22.

31 Ibid., p. 26.

32 Ibid., p. 22.

33 Ibid., pp. 16, 17, 26, 28 and 40.

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34 Bill C-231 (First Session, 27th Parliament, 14-15 Elizabeth II, 1966).

35 Ibid., pp. 3 and 68.

36 Ibid., pp. 3, 14 and 18.

37 Ibid., p. 25.

38 Ibid., p. 34.

39 Ibid., p. 42.

40 Ibid., p. 64.

41 Ibid., pp. 27, 32, 37, 43 and 64.

42 Ibid., pp. 25 and 34.

43 Ibid., p. 27.

44 Ibid., p. 30.

45 Ibid., p. 45.

46 Ibid.

47 Ibid., p. 46.

48 Ibid., p. 50.

49 Ibid., p. 54.

50 Ibid., p. 62.

51 Ibid., p. 66.

52 Ibid.

53 Ibid., pp. 68-73.

54 Ibid., pp. 74-76.

55 Ibid., p. 23.

56 Ibid., p. 40.

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TRANSPORTATION SUBSIDIES PAID BY THE FEDERAL GOVERNMENT,
AS OF 1966, CANADA

1. Subsidies paid under the Maritime Freight Rates Act on behalf of Maritime shippers for a reduction of freight rates. The amount totalled $15,768,999 for the fiscal year ending March 31, 1966.

2. East-West "Bridge" Subsidy which was established for the reduction of class and non-competitive commodity rates. An amount of $7.0 million a year has been paid. This subsidy is used to bear part of the burden of transport over unproductive territory in Northern Ontario.

3. Freight Rates Reduction Act. An amount up to $20.0 million has been made available annually. This was established to apply to class and non-competitive commodity rates in respect of the 1958 seventeen per cent freight rate increase.

4. Payment in lieu of the MacPherson Royal Commission recommendations. An amount of $50.0 million was paid annually from 1961 until the new legislation.

5. In 1965 the Federal Government paid an amount of $19.0 million on behalf of the 1964 railway wage increases. A similar account for $25.0 million for 1965, was presented in March 1966.

   Items 3, 4 and 5 above totalled $87,651,098.81 for the year ended March 31, 1966.

   The Board of Transport Commissioners' Annual Report for 1966 stated that for the actual years of 1964, 1965 and 1966 the $50.0 million subsidy plus additional payments totalled $62.0 million, $75.5 million, and $80.0 million, respectively. The figures above end at the first quarter of the year.

6. In addition to the foregoing there is feed freight assistance paid directly to the millers to reduce transport costs for consumers. These payments totalled $20,999,594 during the 1965-1966 fiscal year. Eastern millers received $17,725,881, while British

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Columbia millers received $2,176,261. In addition there were some storage payments involved. In 1961, Ontario and Quebec millers received approximately $12.0 million.

To date, since the inception, Eastern millers have been paid $385,662,650, while those in British Columbia have been paid $42,062,842. According to the Canadian Trucking Associations, Inc., about eighty-five per cent of the feed grain in Ontario and fifty to sixty per cent in Quebec is moved by truck. (Letter to the writer dated September 12, 1966).

7. During the 1965-1966 fiscal year coal subventions were paid in the amount of $23,396,702.43. These were in aid of the transport of coal.

SOURCE: Public Accounts of Canada for the fiscal year ended March 31, 1966, Volume II (Ottawa: Queen's Printer).

Item 1, p. 43.23; Item 2, p. 43.50; Items 3, 4 and 5, p. 43.51; Item 6, p. 17.5; and Item 7, p. 24.25.

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PRAIRIE RAIL NETWORK GUARANTEED TO JANUARY 1, 1975, CANADA

The guaranteed prairie rail network in the three Prairie Provinces is comprised of 17,000 miles of branch lines which the railways will not be permitted to abandon before January 1, 1975. Lines not included are subject to discontinuance in accordance with Section 168 of the Railway Act, which means that hearings will be held in the usual manner for unprotected lines. There is the option for the railways to have branch line applications heard under Section 168 or under Section 314 of the revised statute. Unprotected branch lines amount to 1,838.9 miles, as shown in the table below.

The basic reason for the plan is to eliminate uncertainty and, thus, aid long-range planning for communities, elevator groups, government and railways.

Volume of traffic was the basic factor in determining those lines which would be included in the network. Suitable alternative rail facilities and redevelopment problems were carefully considered in determining the network. Consultation was held with elevator groups, the railways and the provincial authorities.

Following are mileage data:

TOTAL FIRST MAIN LINE MILEAGE, UNPROTECTED MILEAGE
AND MILEAGE FILED FOR ABANDONMENT,
BY PROVINCE, CANADA

Province	(a) Total First Main Line Mileage	(b) Mileage Filed For Abandonment	(c) Unprotected Mileage	Per Cent (c) of (b)
Alberta	5,708.1	557.3	330.8	59.4
Saskatchewan	8,565.7	2,448.0	1,010.0	41.3
Manitoba	4,858.0	1,081.4	498.1	46.1
Total	19,131.8	4,086.7	1,838.9	45.0

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two sheets)

By August 1966, the railways had filed applications with the Board of Transport Commissioners to abandon over 4,200 route miles, of which 4,086.7 miles were on the Prairies, as shown in the table above.

The Department of Transport states that closure of the unprotected branch lines would not have any great effect on trucking, as most of the traffic would have previously been competed away by trucks. These lines transport only grain. Farm trucks may perform longer mileage as a result of abandonments but there will be no large-scale effect on trucking.

SOURCE: The above information was extracted from a prepared statement of the Federal Minister of Transport, dated September 12, 1966, and from a letter to the writer, from the Department of Transport, dated November 28, 1966.

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four sheets)

BACKGROUND MATERIAL RELATING TO CONTROL OF TRUCKING IN CANADA

When the British North American Act was framed, roads were of local importance only and, thus, their responsibility was assigned to the provinces. The Federal Government focused its attention on the steam railway, the chosen instrument of development. The provincial governments, however, paid little attention to roads, leaving them to the municipalities. It was not until after the advent of the motor vehicle, i.e., until after the turn of the century, that the provinces displayed any interest in roads and road building and maintenance.[1] With the passage of time the various provinces enacted legislation to control motor vehicles. As long as the motor vehicle was confined to local areas this arrangement was adequate. However, in the 1930's, trucking started to compete with the railways on an extra-provincial basis. Thus trucking, controlled by the provinces, was competing with the railways, which were controlled by the Federal Government.

The Duff Royal Commission[2] of 1931-1932, which inquired into railways and transportation in Canada, suggested among other things that trucking be controlled on the same basis as the railways.[3] The Commission gave a number of reasons for the railways' problems, one of which was highway competition.

The Federal Government made no attempt to assume control of extra-provincial trucking until 1937, when a Bill - Senate Bill "B"[4] - was introduced to bring this category of trucking under Federal control. The Bill was defeated in the Senate and it was withdrawn. The provinces and trucking industry registered strong opposition. A similar attempt was made in 1940, but with the same results.

The Rowell-Sirois Royal Commission[5] on Dominion-Provincial relations pointed out that a $4.0 billion railway system in Canada was being challenged by a new system - highway trucking - which was almost under the exclusive jurisdiction of the provinces. The Commission felt the basic problem was to assure to the public a national transportation system in which all the parts would function smoothly and each would function in its own sphere and furnish the best service at the lowest overall cost. The Commission did not suggest Federal control over extra-provincial trucking but it felt there should be

intimate, cordial and continuing cooperation between the Federal and Provincial Governments.[6] This was a sound suggestion but it was not followed as it should have been.

The Turgeon Royal Commission[7] considered the possibility of intra-provincial trucking being placed under Federal control but considerable opposition was expressed towards this thought by most provinces, the trucking industry and various organizations.[8] The Turgeon Commission did not make a recommendation in this respect. The Commission also considered the question of placing extra-provincial trucking under Federal control, stating that such was the situation in the United States, but it was also pointed out that the proportion of extra-provincial trucks in Canada was less than the proportion of inter-state trucks in the United States. The two previous attempts for Federal control were mentioned and the Commission said, "The time has come when Parliament might well reconsider this question of control...."[9]

The Test Case For Federal Control

While the Turgeon Commission was still sitting, a case arose in New Brunswick which tested the legality of Federal Government control over extra-provincial trucking. Under Section 92 of the British North America Act the provincial governments were able to make laws in relation to local works and undertakings but not those connecting other provinces or extending beyond the limits of a province.

The MacKenzie Coach Lines from Lewiston, Me., was granted permission to operate on New Brunswick highways but it did not have permission to pick up and set off passengers, which it undertook to do. A New Brunswick bus operator obtained an injunction from the Courts to restrain the MacKenzie Coach Lines from its action. The latter took the matter to the Supreme Court of Canada in February 1951. On October 22, 1951, the Court ruled that the New Brunswick Government did not have power to restrict the MacKenzie Coach Lines as it had no power over extra-provincial traffic. They said such operations were under Federal jurisdiction. The Provinces of Prince Edward Island, Ontario and Alberta appealed the case to the Judicial Committee of the Privy Council in London, England. In February 1954, the Privy Council upheld the Supreme Court ruling.[10]

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Delegation of Federal Control

After the Privy Council's decision, the Federal Government made a surprise move. It introduced the Motor Vehicle Transport Act[11] which was assented to in July 1954. This Act stated that if any provincial government regulatory board made a request of the Governor in Council, the latter could proclaim the provincial board a Federal regulatory agency for control of truck and bus operations in extra-provincial service. The provinces readily availed themselves of this provision.

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FOOTNOTES FOR APPENDIX XXI

1 For a history of roads see "Our Transportation Services," published by the Department of Citizenship and Immigration (Ottawa: Queen's Printer, 1954).

2 Appointed under P.C. Order in Council 2910, 1931.

3 Report of the Royal Commission to Inquire into Railways and Transportation in Canada (Ottawa: Queen's Printer, 1932), p. 63.

The Duff Commission also recommended that there be cooperation between the Canadian National and Canadian Pacific Railways. There emerged the Canadian National-Canadian Pacific Act of 1933 (34-24 George V., Chapter 33), providing for cooperation between the railways.

4 Senate Bill "B" was entitled "An Act to Establish a Board of Transport Commissioners for Canada, with Authority in Respect of Transport by Railways, Ships, Aircraft and Motor Vehicles."

5 Under the Chairmanship of Doctor Joseph Sirois. (Appointed under P.C. Order in Council 1908, 1937).

6 Report of the Royal Commission on Dominion-Provincial Relations (Ottawa: Queen's Printer, 1940), Book II, p. 200.

7 Under the Chairmanship of the Honourable W.F.A. Turgeon.

8 The Royal Commission on Transportation, Op. cit., February, 1951, p. 278.

9 Ibid., pp. 278 and 279.

10 See Canadian Institute of Traffic and Transportation Certificate Course, Op. cit., Chapter Eight, pp. 3 and 4.

11 2-3 Elizabeth II, Chap. 59, 1954, Op. cit.

Appendix XXII

Following are six significant points which were included in, or related to, Part III of Bill C-231, which became the National Transportation Act. These items did not appear in the original Bill C-231 but were adopted by the Government following representation by the Canadian Trucking Associations, Inc.

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1. Provincial motor carrier regulatory bodies are empowered to act as examiners for the Canadian Transport Commission. This procedure avoids cost for duplicate facilities.

2. Provision is included in Part III for "grandfather rights." This provision guarantees that any existing licenses under the Motor Vehicle Transport Act would be valid under the National Transportation Act.

3. While the original Bill C-231 provided that extra-provincial transport operators would require a license from the Canadian Transport Commission, it did not provide for violation of license, which the Trucking Associations suggested. This feature was included in the Act.

4. Recognition of provincial tariff bureaus for filing rates on behalf of motor carriers was added to Part III.

5. Provision was included in Part III of the Act to make both a shipper and a carrier, who may have acted in collusion in illegal rate-cutting, equally liable for a fine, not exceeding $5,000, and/or imprisonment not exceeding one year.

6. Up to the present, the railways have only transported in piggyback service their own trailers, those of their subsidiaries, those of trucking companies possessing running rights between the terminals involved, and some private trailers. The Canadian Trucking Associations pointed out that if the railways relaxed these rules, under the original Bill C-231 a motor vehicle operation could operate piggyback and container service interprovincially and ignore the rules of the Canadian Transport Commission. The section of the Bill was re-worded to eliminate this possibility. The change was primarily aimed at freight forwarders.

SOURCE: Canadian Trucking Associations, Inc., Transport Review, Ottawa, December 12, 1966 and February 1, 1967.

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THE CANADA LABOUR (STANDARDS) CODE

The Canada Labour (Standards) Code,[1] which became effective July 1, 1965, was an Act passed to legislate various minimum labour provisions as affecting 380,000 workers in industries under Federal jurisdiction,[2] including railways and highway transport in extra-provincial operations. Approximately 1,000 trucking companies are affected.[3]

The main provisions of the Act are:

1. A standard eight-hour day and a forty-hour work-week, with overtime limited to eight hours a week and paid at one and one-half times the regular rate.

2. A minimum hourly rate of $1.25 an hour.

3. Two weeks' annual vacation with pay.

4. Eight general holidays a year.

Bill C-126, which became the Labour Code, was first introduced in the latter part of 1964. In the terms of the Canadian Trucking Associations, Inc., it "...received first and second reading at break-neck speed and then went before the Committee of the Whole House..."[4] After extensive discussion and opposition the Bill was withdrawn. With amendments, it was re-introduced in February 1965 and a month later it became law. During debate on the Bill, one of the remarks made by the Honourable Allen J. MacEachen, Minister of Labour, was that the hours of work in the trucking industry were excessive and he felt it was in the interest of public safety and the welfare of truck drivers to reduce working hours.[5]

One of the provisions which was added to the Bill after its withdrawal was a deferment provision. Under the Act an industry making application for exemption, prior to July 1, 1965, was automatically exempted until the Minister made an order for exemption. From that point, if it was proven to the satisfaction of the Minister that the Bill would be unduly prejudicial to the employees or to the operation, then the Minister had the right to defer (up to eighteen

months) the application of the provisions to the particular industry concerned. A specific date for the order was not set out. He would not have to make his order, for example, before 1968. In the meantime extra-provincial trucking is exempt. After an inquiry the Governor in Council, on the recommendation of the Minister, has the power to defer or suspend the operation of the Act as applying to the particular industry involved.[6]

Because of the problems involved, the extra-provincial trucking group endeavoured to be exempted from the Act, but the Department of Labour did not accede to this request. However, the provision regarding hours of work was not applied to extra-provincial trucking companies as deferment was obtained by application for exemption.[7]

On April 5, 1967 the Department of Labour appointed an Inquiry Commission consisting of Mr. C.A.L. Murchison, Q.C., of Ottawa.[8] Hearings were held in August of 1967 with the possibility of a report by the year end.[9] An attempt is being made to ascertain the effect of the hours-of-work provision on extra-provincial trucking operations. Representations were made by the Canadian Trucking Associations, Inc., the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America, and other similar associations and organizations. The Teamsters' Union represents at least seventy per cent of the trucking employees. The inquiry must be held for the Governor in Council to accord an indefinite suspension of any of the terms of the Act for the trucking industry.

There is a provision in the Labour Code which allows a trucking operation, upon notification of the Department of Labour, to average hours over a period of thirteen weeks. Overtime would be paid after ten hours on any one day during the averaging period. Special permission is required to average beyond thirteen weeks.

There follows a comparison of Ontario legislation, the new Canada Labour (Standards) Code and the existing labour agreement provisions in Ontario at the time of passing of the legislation.

Appendix XXIII
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four sheets)

COMPARISON OF BILL C-126 WITH ONTARIO LABOUR LAW
AND ONTARIO LABOUR AGREEMENTS, 1965

HIGHWAY DRIVERS

	Ontario Law	Bill C-126	Ontario Agreements
Standard Hours of Work:			
Per Day	8	8	(Limited to Provincial
Per Week	48	40	(Legislation
Maximum Allowable Overtime:			
Hours Per Week	12	8	Same as above
Total Permissible Hours Per Week	60	48	Same as above
Total Permissible Hours Per Year	3,000	2,000	Same as above
Rate of Overtime Pay	Straight Time	1½	Straight Time

HOURLY-RATED PERSONNEL

	Ontario Law	Bill C-126	Ontario Agreements
Standard Hours of Work:			
Per Day	8	8	Up to 10
Per Week	48	40	Up to 48
Maximum Allowable Overtime	100 (Per Year)	8 (Per Week)	(Limited to Provincial (Legislation
Total Permissible Hours Per Week	50 (Average)	48	Same as above
Total Permissible Hours Per Year	2,000	2,000	Same as above
Rate of Overtime Pay	Straight Time	1½	1½

SOURCE: Letter dated December 16, 1964, from Mr. J.A. Donaldson, Manager, Motor Transport Industrial Relations Bureau of Ontario (Inc.), Toronto, to the Honourable Allen J. MacEachen, Minister of Labour, Ottawa.

Appendix XXIII
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four sheets)

FOOTNOTES FOR APPENDIX XXIII

1 13-14 Elizabeth II, Chap. 38.

2 Interprovincial railways, pipelines, telegraphs, telephones, interprovincial and international highway transport and ferries, all radio and T.V. broadcasting, all shipping and services connected therewith, all air transport, all banks, all uranium mining and processing, all grain elevators, all flour and feed mills, feed warehouses and seed cleaning mills, primary fishing, where fishermen work for wages, and most Federal crown corporations.

The worker estimate appeared in Truck Transportation, Op. cit., April, 1965, p. 20.

3 As mentioned, these are listed in application for deferment notice, which appeared in the Canada Gazette, Op. cit., Part I, October 23, 1965.

4 D.A. Chapman, "C.T.A. Reports, A Monthly Review of National Trucking Developments," Maritime Truck Transport Review (Moncton, N.B.: Maritime Motor Transport Association, Inc.), January, 1965, p. 5.

5 Charles W. Moffatt, "From Where I Sit," Maritime Truck Transport Review (Moncton, N.B.: Maritime Motor Transport Association, Inc.), March, 1965, p. 3.

6 13-14 Elizabeth, Chap. 38, Op. cit., pp. 19-20.

7 The Canada Gazette, Op. cit., Part I, October 23, 1965.

At least forty applications for deferment were received by the Department of Labour. See Maritime Truck Transport Review, Op. cit., June, 1965, p. 3.

8 News Release No. 6568, Department of Labour, Ottawa, April 5, 1967.

9 Letter to the writer, dated July 10, 1967, from Mr. Marius Gendreau, Assistant General Manager, Canadian Trucking Associations, Inc.

Appendix XXIV
(Sheet one of
two sheets)

SURVEY OF THE CANADIAN INDUSTRIAL TRAFFIC LEAGUE REGARDING THE TRUCKING STRIKE IN ONTARIO AND QUEBEC, FROM JANUARY 20, 1966 TO MAY 1, 1966

The Canadian Industrial Traffic League surveyed shippers for their reactions on the 1966 trucking strike in Ontario and Quebec. One hundred and thirty-one shippers replied. Following are some of the findings. One question asked was, "What is your assessment of the service performed by other modes of transport during the strike when handling your diverted traffic?" In reply the shippers indicated the following opinions:

SHIPPERS' ASSESSMENT OF VARIOUS TYPES OF TRANSPORTATION SERVICES USED FOR DIVERTED TRAFFIC DURING THE 1966 ONTARIO TRUCKING STRIKE

Service	Poor	Fair	Satisfactory	Good	Excellent	Total
			Number of Shippers			
Rail Carload	9	19	41	26	8	103
Rail Piggyback	12	22	14	12	5	65
Rail L.C.L.	67	25	4	-	1	97
Rail International	40	21	13	3	2	79
Express	48	30	13	18	2	111
Rail Pool Car	15	32	25	20	2	94
Private Trucking	-	2	18	10	23	53
Leased Trucking	-	2	23	21	17	63
Cartage	2	11	18	40	21	92

NOTE: Not all shippers answered on all modes. In some instances, however, two or more assessments may be given.

SOURCE: Canadian Industrial Traffic League, Bulletin Issue No. 4281, March 25, 1966.

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(Sheet two of
two sheets)

From the above table the shippers involved would seem to view private and leased trucking and cartage with considerable favour. Rail carload was also fairly well regarded. Many of the shippers, however, did not show great favour for piggyback, L.C.L., rail international, and pool car services. This survey is a limited sample and as these shippers were using truck service prior to the strike, it could be considered that at least some of these other services, such as L.C.L., express and pool car had been used earlier and had not entirely met the particular needs of these shippers.

Following are four questions which were asked on future trends in distribution of their products. The number of answers received and future plans are indicated in each instance:

Do you plan to make more use of other carriers?

Yes: 58 No: 33

Do you plan to increase private motor trucking?

Yes: 22 No: 50

Do you plan to increase the use of leased trucks?

Yes: 23 No: 53

What per cent of your traffic will revert to your original motor carrier when the strike is over?

Per Cent of Traffic		Firms
90 and Over	-	50
80 to 89	-	13
70 to 79	-	20
60 to 69	-	6
50 to 59	-	10
40 to 49	-	2
30 to 39	-	1
20 to 29	-	2
10 to 19	-	-
Up to 9	-	5
No Comment	-	13
		122

Appendix XXV
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five sheets)

PIGGYBACK TRANSPORTATION IN CANADA

Mr. D.W. Carr and Associates, Transportation Consultants, made a study of piggyback transportation for the MacPherson Royal Commission on Transportation. The study, which was undertaken in 1959, appeared in Volume III of the Commission's report, at pages 96-151. Following are the highlights:

Introduction

The Carr study stated that piggyback was one of the most promising developments of the railways' modernization program. It had enabled the railways to stop the flow of traffic to trucks and, also, it had regained lost traffic for the railways. Piggyback had bridged the gap between boxcar traffic and trucking, some of the advantages being reduced freight handling costs, a faster service, reduced loss, damage and pilferage costs, and an ability to meet special transportation needs. However, some disadvantages existed when compared with highway trucking.

Growth

Canadian National, Canadian Pacific and the Pacific Great Eastern Railways had instituted piggyback services. In 1952 the two large railways had commenced to carry their own trailers and, in 1957, commenced to transport trailers of highway common carriers. From January 1958 to May 1961, monthly trailer loads increased fourfold, from 3,932 to 15,472. By 1960 piggyback comprised 4.26 per cent of railway traffic. In the United States it comprised only 1.82 per cent of traffic. On Canadian Pacific the ratio of common carrier trailers to railway trailers was five to one. On the Canadian National this ratio was one to one.

Routes

By 1959 both major railways had piggyback routes from coast to coast, serving primarily industrial cities. Canadian Pacific had expanded faster than Canadian National, and, by 1960, the former had eighty-four piggyback routes totalling 6,000 miles, serving twenty-four routes. Heavy growth had been in the industrial areas, such as Montreal, Toronto, Hamilton, London, Windsor and Sarnia. Half of the total loadings were between Montreal and Toronto.

Plans

The following five piggyback plans which were in effect in the United States were shown. They were: The railways supply the flatcars and the for-hire carriers supply the trailers; the railways handle their own trailers; the railways supply the flatcars but the trailers are owned by the shippers or private carriers; the shippers provide both the trailers and the flatcars; joint rail-truck rates which permit the railways or the highway carriers to take shipments originating in, or going to, the other's territory.

The first two plans were in effect in Canada, seventy-five per cent of the traffic being moved under the first and twenty-five per cent under the second.

Equipment

The cost of the circus-type ramp loading facilities for piggyback was compared with a standard industrial terminal. A New Jersey study for two installations handling the same amount of freight revealed that the estimated cost of the piggyback installation was $279,039, while the standard installation cost was $3,031,645 - ten times as much.

By 1959 the Canadian Pacific had 951 flatcars, while the Canadian National had 706.

The Carr study referred to the use of containers but did not hold great prospects for expansion because of the railways' desire to develop trailer piggyback. It was felt that containers would be confined to a few special uses.

Rates

In a comparison made, it was found that the rate for railway trailers between Montreal and Toronto and those of for-hire carriers, was almost identical - sixty-seven cents per hundred pounds for railway trailers, including pick-up and delivery, and sixty-one cents for the for-hire trailers, the difference being the pick-up and delivery cost. However, on the Winnipeg-Edmonton route the Canadian Pacific had signed an agreed charge agreement with its subsidiary, Canadian Pacific Transport Company, for a total rate of $203 per trailer while the rate charged the for-hire carrier was $465.

The report noted that there were considerable differences in rates for the various routes, the low rates being in effect in the heavy-volume areas.

Canada-United States Comparison

It was observed that there had been much more uniformity in piggyback in Canada than in the United States, primarily because of only two major railways involved in Canada compared with fifty in the United States. Also, with fewer highways, piggyback was more able to compete with highway trucking for long-distance freight. There was a closer cooperation between the railways and trucks in Canada; and with long-haul operations, interchange was much less in Canada than in the United States. The Interstate Commerce Commission felt that the lack of standardization in the United States had diverted attention to containers.

It was further noted that both freight forwarding and leasing of equipment were important aspects of the United States operations while in Canada they were not. Comment was also made on the plans used in each country and the supplement of railroad trucking. In Canada the railways were allowed to acquire for-hire trucking

companies while in the United States railways were allowed to acquire trucking interests which supplemented their rail lines.

Advantages of Piggyback

In a comparison with boxcar operations, the general advantages of piggyback were speed, less freight handling, flexibility, adaptability and a reduction in loss, damage, and pilferage costs. These advantages had enabled the railways to enjoy traffic growth and to obtain high-rated traffic from highway vehicles without large capital expenditures. Utilization of equipment had increased fourfold. Revenue per unit of freight had increased. Damage claims had been reduced, and a very dependable service had been established.

There were, however, limitations on piggyback. It had advantages for shipments under 15,000 to 20,000 pounds, its benefit being in express, L.C.L. and manufactured and miscellaneous boxcar traffic. This type of traffic comprised about twenty-five to thirty per cent of the total, of which it was estimated that piggyback could attract about ten per cent of total traffic. As mentioned previously, it had reached 4.3 per cent of railway carloadings at the time of the study.

Other limitations on trailer piggyback resulted from handling costs. It was inhibited in competing up to 250 miles, loading facilities required trainloads to make it profitable, and terminal-to-terminal service was necessary, eliminating intervening stations.

Various cost studies had been undertaken. Surveys in Ontario and Quebec indicated that trailer piggyback costs were twelve per cent higher than trucking costs. The main cost-reducing feature for piggyback was volume.

A comparison of advantages and disadvantages of the use of trailer piggyback by for-hire firms was made. The disadvantages listed were that there was a higher cost than for highway movements; that there was a loss of independence to the railway companies; that there was slower service than by highway; that it was more costly for scheduling, dock and pick-up and delivery service; that there was less flexibility; that there was little supervision and control of refrigeration equipment; that more trailers were required than for

highway operations; and that trucking management lost some control over speed and flexibility for shippers.

The advantages listed were that piggyback was beneficial in special circumstances (peak loading, frosty weather); that it allowed expansion without as large an investment as otherwise; that it permitted Sunday movements; that trailers could be rebalanced between terminals without tractor use; that there was less exposure to accidents; and that some costs were eventually reduced, e.g., licenses.

It was stated in the Carr report that early enthusiasm by trucking operators had been dissipated after three years.

Patterns of Overland Transport

A concluding section of the report on changing transport patterns referred to the railway acquisition of truck lines. It pointed out that where the railways did not expect boxcars and piggyback to compete, truck lines were being acquired. It was considered that piggyback was not strong enough against truck competition to prevent continued loss of traffic but that piggyback would be the main defense against trucking operations. The Carr report held out little hope for containers. It envisaged keener competition between the railways and highway operators as highways developed and the Trans-Canada and other highways were completed. It was thought that patterns would not be established for several years.

Appendix XXVI

RAIL CARLOADINGS OF PIGGYBACK TRAILERS IN CANADA AND THE UNITED STATES, 1958-1965

Year	Piggyback Carloadings Canada	Percentage Increase Each Year	Piggyback Carloadings United States	Percentage Increase Each Year
1958	77,109	-	276,767	-
1959	133,929	73.6	415,156	50.0
1960	154,898	15.7	554,115	33.5
1961	171,341	10.6	591,195	6.7
1962	169,398	- 1.0	706,441	19.5
1963	199,416	17.7	797,474	13.0
1964	223,005	11.8	890,216	11.6
1965	232,178	4.1	1,031,210	15.8
Overall Increase	201.1 per cent		272.6 per cent	

NOTE: There was a highway trucking strike in Canada in 1962, which resulted in the lower number of trailers.

SOURCE: D.B.S., Rail Carloadings, 1958-1965; Truck Transportation, Toronto, April, 1966, p. 22.

RAIL CARLOADINGS OF PIGGYBACK TRAILERS AND TOTAL RAIL CARLOADINGS IN CANADA, 1958-1965

Year	Piggyback Carloadings	Total Rail Carloadings	Piggyback Percentage of Total
	Thousands	Thousands	
1958	77.1	3,771.0	2.04
1959	133.9	3,854.9	3.47
1960	154.9	3,635.4	4.26
1961	171.3	3,464.1	4.95
1962	169.4	3,541.5	4.78
1963	199.4	3,632.6	5.49
1964	223.0	3,928.9	5.68
1965	232.2	3,980.8	5.83

SOURCE: D.B.S., Rail Carloadings, 1958-1965.

Appendix XXVII

CANADIAN NATIONAL AND CANADIAN PACIFIC PIGGYBACK OPERATIONS CONVERTED TO HIGHWAY GROSS TON MILES AND TOTAL ROAD AND RAIL INTERCITY TON MILES, 1952-1964

Year	Millions of Piggyback Highway Gross Ton Miles	Millions of Intercity Ton Miles			Per Cent Piggyback
		Road	Rail	Total	
1952	-	8,903	68,430	77,333	-
1953	30	9,778	65,267	75,045	*
1954	47	10,012	57,547	67,559	*
1955	125	10,248	66,176	76,424	*
1956	235	10,614	78,820	89,434	*
1957	279	10,679	71,047	81,726	*
1958	980	14,080	66,357	80,437	1.2
1959	1,594	14,397	67,957	82,354	1.9
1960	1,831	13,841	65,445	79,286	2.3
1961	1,939	16,099	65,828	81,927	2.4
1962	2,047	16,585	67,937	84,522	2.4
1963	2,451	16,704	75,796	92,500	2.7
1964	2,933	18,181	85,033	103,214	2.8

NOTE: * Less than one per cent.

SOURCE: The Railway Association of Canada, "The Development in Canada of Railway Piggyback Service," Montreal, December, 1965, p. 6; D.B.S., Weekly Bulletin, February 17, 1967.

Appendix XXVIII
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four sheets)

STUDY BY THE CANADIAN NATIONAL RAILWAYS ON THE USE OF VAN-TYPE CONTAINERS IN EXPRESS-FREIGHT SERVICE, SEPTEMBER, 1965

Introduction

Where speed is extremely important in express-freight operations, the Canadian National found that greater utilization of equipment and considerable economies could be obtained by the use of containers. However, in their study it was difficult to determine exact profit and service advantage from van-type equipment because of the interchange of equipment for other purposes.

Possibilities

The railway officers felt that there were four major factors involved in van-type container operations. They were reliability, speed, reduction in loss and damage and minimum expense. It was considered that these four factors should be balanced, i.e., all factors given equal attention.

Operational Steps and Container Advantages

Following is a brief outline on the advantages of containers at each operational step in express-freight operations. Documentation of shipments is eliminated because it is felt that little change would take place with a changeover to van-type containers.

Compilation of Express-Freight Shipment Pick-Up Schedules and Pick-Up Operations. In instances where larger shipments may be involved, with careful planning, a container may be left for loading while the pick-up truck is free to return for another container. Where the first shipper does not have a sufficient load for the container, frequently it is possible to move the container to a second shipper to

complete the load. For small shipments such an arrangement could not apply. If careful planning exists, it is estimated that a driver with a sufficient number of containers could double the amount of traffic he would handle. Thus, the cost with conventional methods of $30.00 a day (as calculated by the Canadian National) could be reduced to $15.00 a day. Additional cost for heated containers would be $2.00 a container. Also, additional equipment cost would result in interest, principal and maintenance costs of $2.75 a day. Thus the saving would be reduced to approximately $10.00 a day. It should be noted that these calculations assume no change in the cost of the power unit.

Shipments Unloaded and Sorted at Origin Terminal; Also Shipments Loaded on Line-Haul Vehicles. If a driver returns with a full container, part of which load is for one terminal, he could be usefully employed in unloading the "fillout" traffic. As a matter of interest, only one man at one time can work conveniently in a container.

The ideal situation for container use is that a container be packed for movement to a specific consignee and that it does not move through a terminal, moving only from a pick-up vehicle to a line-haul vehicle. The cost of moving a container from one vehicle to the other and locking it in place is $1.50 to $2.50.

Line-Haul Movement. Two major advantages existing in the line-haul movement of van-type containers are that the net/tare ratio is much better than other transport arrangements and, second, there is a possibility for a greatly decreased transfer cost at intermediate terminals.

Two twenty-foot containers on a boxcar underframe contain about 2,000 cubic feet, while a boxcar has approximately 3,500 cubic feet. However, seldom is a boxcar fully loaded whereas containers are generally packed to the roof, primarily due to both convenience of packing and smaller shipments available for particular destinations, i.e., the smaller unit is more suitable to the traffic.

To illustrate savings which may be achieved in a line-haul movement, assume two containers, which are to be sent to different destinations, are being used in an operation. One container could

be set off en route while the other is taken to its destination. The Canadian National calculated costs for a 400 mile trip. A train of thirty cars, with a four-day cycle, and return of the cars 100 per cent empty, would result in savings of $120 a trip and $37,000 per annum.

It was estimated that considerable savings in transfer work at intermediate terminals can be achieved with containers, especially with a high volume of traffic. On the assumption that transferring of goods costs $5.00 a ton, the equivalent of a container load of five tons would cost $25.00. By container use this could be reduced to $2.50, or one-tenth of the former method, with considerable decrease in loss and damage.

Line-Haul Cost Comparison. Consideration was given to the line-haul costs of moving containers by rail and by highway. For a hypothetical example of moving containers, a distance of two hundred miles was assumed, with empty containers for the return journey.

For rail transport, it was assumed a locomotive utilized to a medium degree would be used, three twenty-foot containers weighing 5,000 pounds each would be utilized, and each would be packed with 10,000 pounds of cargo, transported on one car. The car would be transported in a train of thirty cars. The cost for transporting the container car would be:

	Rounded
Locomotive cost - 2 x 200 miles @ $2.75 a mile, divided by 30 cars	$37.00
Switching cost - average per car for 30 cars	20.00
Car cost - 2 x 200 miles @ 3.75¢ a mile plus $6.00 (3 day cycle) per car	21.00
Fuel and Track cost - 1/20¢ per ton mile (15 x 200 x 1/20 plus $7\frac{1}{2}$ x 400 x 1/20)	3.00
Containers - interest, depreciation and maintenance - $2.00 a day	18.00
Total	$99.00

Thus, to carry fifteen tons 200 miles would cost $6.60 per ton or 3.3 cents per net ton mile.

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four sheets)

Turning to highway transport, the Canadian National calculated that a forty-foot truck chassis, over longer distances, could transport two containers for thirty-five cents a loaded mile and thirty cents an empty mile. In the situation mentioned above, with a three-day cycle, the cost of transporting two containers by road would be:

Loaded - 200 miles @ 35¢ per mile		$70.00
Empty - 200 miles @ 30¢ per mile		60.00
Container cost - $2.00 a day		12.00
	Total	$142.00

Thus, carrying ten tons 200 miles would cost $14.20 per ton, compared with $6.60 per ton by rail. By highway, transport cost per net ton mile would be 7.1 cents, while rail would cost 3.3 cents per net ton mile. This finding would encourage rail line-haul wherever possible.

Unloading the Line-Haul Vehicle. Savings in the unloading operations depend on the type of traffic and the size of shipment. Maximum saving would be achieved where a container was carrying only one shipment. No loading and unloading of the contents would occur and the container could be transferred from the line-haul vehicle for delivery to the consignee's dock. Nevertheless, even if the full contents of the container have to be unloaded and sorted, the cost would be less than a forty-foot trailer or long railway car because of the penetration distance.

Delivery. Economies may be effected if care is exercised in delivery. Where a large shipment and a number of small ones are loaded in a container, the driver may deliver the small shipments and then place the container on legs for unloading the large shipment, which would allow the driver to commence delivery of other containers.

Appendix XXIX
(Sheet one of
two sheets)

USE OF CONTAINERS IN PRIVATE TRUCKING OPERATIONS

The following information was contained in a letter to the writer, from the Dominion Electrohome Industries, Limited, dated October 13, 1966.

Dominion Electrohome Industries, Limited, Kitchener, Ontario, manufactures a wide range of products, including coloured television sets, stereo sets, radios, furniture, fans, humidifiers, intercom systems, and heating and lighting units. Some of the articles are manufactured in one plant, while others, such as television parts, are manufactured in the Company's various plants and carried by truck to one plant for assembly operations. Therefore, there is a considerable trucking operation between the Company's plants in Kitchener.

In 1962, with only six plants, Dominion Electrohome was using four standard trucks with stake or box bodies and, in addition, several cartage trucks were hired on a full-time basis. Cost of truck transportation exceeded $30,000 a year. Trucks were travelling only 5,000 to 6,000 miles a year.

In 1963, three truck chassis for carrying containers and twelve eighteen-foot containers with roll-down rear doors, were obtained. These units were able to replace the four standard trucks being used and, also, the hiring of additional cartage trucks was reduced to a large extent. After a period of time it was conservatively estimated that the annual savings on the Company's truck operations totalled $20,000. The mileage on the power units was almost double that of the former truck units, totalling 11,000 miles per power unit. Each unit was handling approximately fifty container loads a day.

A further benefit from the changeover is that at some of the smaller plants the containers can be used as portable warehouses. The door may be rolled down and locked. Such containers can be moved to the central warehouse after production is finished for the day. The containers can be loaded and unloaded by plant personnel at their convenience and little or no waiting time is involved for drivers.

An additional truck chassis and four containers were obtained in 1966, bringing the total number of chassis to four and

the container total to sixteen. The Company states that present units would seem to be optimum for their operation because it is possible to rent local containers for a "nominal fee", on a short-term basis.

The chassis are licensed to carry just over 9,000 pounds and there are no licenses required for the containers.

The officials of Dominion Electrohome Industries, Limited, are very pleased with their present fleet which ideally meets the particular needs of the operation.

Appendix XXX

USE OF FLEXI-VAN CONTAINERS AS COMPARED WITH PRIVATE CARRIAGE

Savings of a Boston firm shipping six trailerloads weekly to Chicago and St. Louis, Mo., are shown below. The units are then deadheaded to Louisville, Ky., for return loads.

Private Carriage Cost:			
Boston, Chicago, Louisville, Boston	-	2,274 miles	
Boston, St. Louis, Louisville, Boston	-	2,476 miles	
		4,750 miles	
Weekly Cost: 4,750 x 6 trailers	-	28,500 miles	
28,500 miles at 37.14¢ per mile	-		$ 10,584.90
Flexi-Van Cost:			
Boston to Chicago and Boston to St. Louis	-	$3,543	
Louisville to Boston	-	3,264	
Van Rental - 12 @ $10 per day - 4 days	-	480	
Pick-up and Delivery - Boston - Chicago - Louisville - St. Louis	-	1,320	
Weekly Cost	-		$ 8,607.00
Weekly Saving: $10,584.90 - $8,607.00	-		$ 1,977.90
Annual Saving: $1,977.90 x 52 weeks	-		$102,850.80

SOURCE: Director of Flexi-Van Sales and Service, New York Central System, New York, N.Y., July, 1966.

Appendix XXXI
(Sheet one of
two sheets)

CARGO CAGES

The following summary is based primarily on a speech made by Mr. D.W. Francis of Canadian Pacific Railway Company, to the National Railroad Piggyback Association, Montreal, July 20, 1966.

The cargo cage, a type of container, is a recent important development in transportation. It was originally designed by the American Trucking Associations, Inc. The Canadian Pacific Railway Company has been able to achieve additional savings on their container operations by the use of cargo cages.

The principle involved in cargo cages is referred to as "batch handling" of small shipments. Cargo cages are forty-four inches wide, fifty-four inches long and seventy-eight inches high, possessing a cubic capacity of 100 cubic feet. Cargo cages can be fitted side by side into a standard container (ninety inches wide) and two can be fitted crosswise in a boxcar (110 inches wide). Cargo cages carry up to approximately 300 pounds.

Initially these cages were used for "batch handling" of small shipments from rail to road to ferry. Up to ten physical handlings were eliminated. As will be understood, each additional handling under conventional methods results in more expense and in greater transit time.

More recently cargo cages have been used by the Canadian Pacific for the movement of fragile shipments such as phonograph records and pharmaceuticals. Such shipments are loaded in a cage and delivered untouched.

One outstanding situation in which the railways have found value in cargo cages, is to be able to set off shipments where an agent is not on duty. The shipments are fully protected.

According to Mr. Francis, one of the leading cargo cage manufacturers in the United States (name unknown to the writer) claims that tests with motor carriers show economies of the following dimensions:

Increased motor carrier efficiency of 200 per cent in handling small shipments under 300 pounds. Increased efficiency of fifteen per cent for all shipments under 10,000 pounds.

A reduction of twenty per cent in the time required for unloading pick-up and delivery trucks and a reduction of twenty-five per cent for unloading line-haul trucks.

An increase of fifty per cent capacity in a motor carrier's conveyor line capacity.

Mr. Francis stated that the above claims had been experienced by the Canadian Pacific. By the use of cargo cages, loading and unloading time at terminals has been reduced to about one-fifth of the time taken for individual express shipments.

In summary, following are the objectives of the manufacturers of cargo cages:

Maximum flexibility, rugged construction, low maintenance costs, low initial costs, minimum cube loss, high transportability, high mobility, maximum loading convenience, ease of assembly and minimum accessories.

Appendix XXXII

A PARTIAL COMPARISON MADE BY GENERAL MOTORS, PACIFIC, LIMITED, OF A GASOLINE TRUCK WITH A DIESEL TRUCK

		Gasoline Truck	Diesel Truck
Tare Weight	-	6,720 pounds	8,230 pounds
Price	-	$6,938.00	$12,283.00

Following are the partial costs for these trucks. The maintenance costs per mile are not estimated but, if they were, according to other information, they would undoubtedly be lower for the diesel truck than for the gasoline truck.

		Gasoline Truck	Diesel Truck
Capital Cost - First Year:			
Interest	-	$ 346.90	$ 614.15
Depreciation	-	2,081.40	3,684.90
Total	-	$2,428.30	$4,299.05
50,000 Miles Per Year:			
		(Cents)	(Cents)
Capital Cost Per Mile	-	4.85	8.59
Maintenance Cost Per Mile	-	?	?
Fuel Cost Per Mile	-	8.50	5.33
Total	-	13.35	13.92
100,000 Miles Per Year:			
		(Cents)	(Cents)
Capital Cost Per Mile	-	2.43	4.30
Maintenance Cost Per Mile	-	?	?
Fuel Cost Per Mile	-	8.50	5.33
Total	-	10.93	9.63

SOURCE: Motor Carrier, Westrade Publications, Ltd., Vancouver, May, 1965, p. 24.

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TYPES OF MOTIVE POWER DISTRIBUTED ACCORDING TO TRUCK CLASSIFICATION, CANADA, 1964

Class	Diesel	Gasoline	Other	Total
		Percentages		
For-Hire	0.8	5.2	*	6.0
Private Intercity	0.3	20.8	0.1	21.2
Urban	0.2	39.5	*	39.7
Farm	-	33.0	0.1	33.1
Total	1.3	98.5	0.2	100.0

NOTE: * Negligible.

SOURCE: D.B.S., Motor Transport Traffic, Canada, 1964, Appendix II.

DIESEL FUEL DISTRIBUTED BY GROSS VEHICLE WEIGHT OF TRUCKS, CANADA, 1964

Weight (Pounds)	Thousands of Gallons	Per Cent	
Up to 5,000	683	0.5)	
5,001 - 10,000	188	0.2)	
10,001 - 15,000	267	0.2)	1.4
15,001 - 20,000	144	0.1)	
20,001 - 30,000	519	0.4)	
30,001 - 50,000	10,786	8.4	
50,001 and over	116,569	90.2	
Total	129,156	100.0	

SOURCE: D.B.S., Motor Transport Traffic, Canada, 1964, Table 2.

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two sheets)

DISTRIBUTION OF MOTIVE FUEL BY TRUCK CLASSIFICATION,
CANADA, 1957 AND 1964

	Millions of Gallons of Fuel					
	1957			1964		
Class	Diesel	Gasoline	Other	Diesel	Gasoline	Other
For-Hire	30.2	133.6	0.5	102.1	179.2	0.3
Private Intercity	5.9	203.1	0.9	20.0	221.6	1.5
Urban	0.9	153.6	*	7.0	260.2	0.3
Farm	-	74.3	-	0.1	87.0	0.1
Total	37.0	564.6	1.4	129.2	748.0	2.2
		603.0			879.4	

NOTE: * Negligible.

Fuel for 1957 and 1964 can be compared. See page 6 of D.B.S., Motor Transport Traffic, Canada, 1964.

SOURCE: D.B.S., Motor Transport Traffic, National Estimates, 1958, Table IB; 1964, Table I.

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CARRIER COVERAGE AND SELECTED STATISTICAL DATA FROM THE DOMINION BUREAU OF STATISTICS FREIGHT MOTOR CARRIERS, AND MOVING AND STORAGE, HOUSEHOLD GOODS REPORTS

History

In 1930, during the Census of Merchandising and Service Establishments, the Dominion Bureau of Statistics obtained limited financial information on road transportation in Canada. Included were common intercity and rural motor carriers of freight and passengers, and urban bus firms.

The first annual motor transport financial report was published by the Bureau in 1941. It was entitled "Motor Carriers Freight-Passenger." Carriers were classified into two categories. Those earning gross annual operating revenues of less than $20,000 a year and those earning $20,000 and over. Carriers were allocated according to intercity and rural passenger and freight, or urban bus categories.

Because of staff shortages from 1942 to 1947, motor carriers earning less than $8,000 a year were eliminated from the motor carrier report.

In 1944 the Canadian Warehousing Association requested that the Bureau issue a warehousing report and, thus, firms engaged in public warehousing were eliminated from the motor carrier report.

Considerable expansion was witnessed in motor carriers after World War II. This required more comprehensive statistics. The Dominion Bureau of Statistics, in cooperation with provincial motor carrier boards and the Canadian Trucking Associations, Inc., endeavoured to meet the need. In 1947 carriers with annual revenues of $8,000 or less were again included in the report of motor carriers.

In 1954 motor carriers of freight were divided into four classes, i.e.:

Class I - Firms with gross annual operating revenues of $500,000 or more.

Class II - Firms with gross annual operating revenues from $100,000 to $499,999.

Class III - Firms with gross annual operating revenues from $20,000 to $99,999.

Class IV - Firms with gross annual operating revenues of less than $20,000.

In 1955 passenger carriers were published in a separate report.

Also, in 1955 the Bureau commenced to collect Class IV questionnaires on a random sample basis to reduce compilation time, because this class of carrier represented sixty-five per cent of the total numbers but accounted for only six per cent of the total revenue. However, in 1958 coverage again included all firms but a sample is now taken of the returns and it is then inflated to represent the total from which it is chosen.

In 1960 firms engaged primarily in the moving of household goods were removed from the motor carrier freight report, and the warehousing report, and they were included in the report covering moving and storage of household goods. This data has been included in the financial information throughout this thesis.

Coverage

Included in the motor carrier report are firms which derive more than fifty per cent of their revenue from intercity service. The two major factors accounting for incomplete coverage are, first, firms engaged predominantly in urban cartage or in some other industry and, second, carriers operating predominantly in the United States which cannot provide separate statistics for their Canadian operations. In addition, factors which account for fluctuations in the total numbers are amalgamations, births and deaths in the industry and improvements in the Bureau's follow-up program.

According to the motor carrier freight report, coverage is now considered to be representative of the industry. Officers of the Transportation and Public Utilities Division of the Dominion Bureau

of Statistics stated that in 1965 there were approximately 13,000 intercity carriers in Canada, many of which were earning less than $20,000 a year. They are included in the Class IV group. As mentioned previously, while they comprise two-thirds of the total numbers, they account for just over six per cent of the total revenue. Those responsible for the collection of the financial statistics consider that coverage extends to firms producing well over ninety per cent of the total intercity revenue. It should be remembered that firms included in this report earn more than fifty per cent of their revenues from intercity service.

Statistical Data

To indicate change in the motor carrier industry, a number of tables appear below. Shown are data relating to revenue for the years 1947, 1950, 1954, 1958, 1962, 1964 and 1965. Balance sheet information is included for 1958 and 1965.

The year 1947 was two years after the War, while the year 1950 was the starting point after the recessionary trends of 1949. The year 1954 is included because of the weeding-out process, mentioned below, and, also, recessionary trends were experienced. It is included in order to show the low point reached during that year and subsequent years. Likewise, recessionary trends were experienced in 1958 and, therefore, this year is included in the selected years. From 1950 onward, two four-year periods were selected and, thus, a third four-year period was included from 1958 to 1962. It is felt that this is an adequate period to show growth trends. The years 1964 and 1965 were selected to show most recent experience, as data for these years are the latest available.

There was a considerable weeding-out of motor carrier reports in 1954. In that year the motor carrier report (page 5) stated in part:

> ...the number of returns tabulated for inclusion in the annual statistics has fallen from 4,040 in 1952 to 2,784 in 1954. This drop has been due in part to an actual reduction in the number of firms in the industry because of mergers, business failures or incomplete returns previously utilized. A further important reason

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for the decline is the practice of carefully discarding unsatisfactory reports in an attempt to improve the quality of these data. This has been most apparent in the freight carrier series where a large number of construction firms, contract carriers, urban transfer firms, etc., have been removed from the mailing lists....

There follows a number of tables relating to financial data.

TOTAL INTERCITY CARRIERS COVERED, TOTAL REVENUES, NET OPERATING REVENUES AND AVERAGES, CANADA, SELECTED YEARS

Year	Number of Carriers	Total Revenues	Average Revenue Per Carrier	Net Operating Revenue	Average Net Operating Revenue
		Millions	Thousands	Millions	Thousands
1947	2,155	$ 65.8	$ 30.5	$ 5.8	$2.7
1950	3,525	111.8	31.7	11.0	3.1
1954	2,411	181.5	75.3	12.5	5.2
1958	4,699	352.1	75.0	23.4	5.0
1962	5,076	496.9	97.7	27.4	5.4
1964	4,608	602.9	130.9	37.4	8.1
1965	4,555	719.1	158.0	42.8	9.4
Overall Percentage Increase (Rounded)	111	993	418	638	248

SOURCE: D.B.S., Motor Carriers - Freight, 1947, 1950, 1954, 1958, 1962, 1964 and 1965; Moving and Storage, Household Goods, 1962, 1964 and 1965.

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INTERCITY CARRIERS EARNING $20,000 OR MORE ANNUALLY, THEIR TOTAL REVENUES, NET OPERATING REVENUES AND RELATED AVERAGES, CANADA, SELECTED YEARS

Year	Number of Carriers	Total Revenues	Average Revenue Per Carrier	Net Operating Revenue	Average Net Operating Revenue
		Millions	Thousands	Millions	Thousands
1947	510	$ 55.4	$108.7	$ 3.7	$ 7.3
1950	718	94.9	132.1	7.2	10.0
1954	848	170.1	200.5	9.8	11.6
1958	1,473	328.3	222.9	18.0	12.2
1962	1,784	470.7	264.0	19.3	10.8
1964	1,904	580.9	305.1	30.7	16.1
1965	2,027	697.0	344.0	36.5	18.0
Overall Percentage Increase (Rounded)	297	1,158	216	887	147

SOURCE: D.B.S., Motor Carriers - Freight, 1947, 1950, 1954, 1958, 1962, 1964 and 1965; Moving and Storage, Household Goods, 1962, 1964 and 1965.

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OPERATING RATIOS, AND PER CENT NET REVENUE OF TOTAL REVENUE, CARRIERS IN INTERCITY SERVICE, CANADA, SELECTED YEARS

Year	Operating Ratio	Per Cent of Net Revenue of Total
1947	91.2	8.8
1950	90.1	9.9
1954	93.2	6.8
1958	93.3	6.7
1962	94.5	5.5
1964	93.8	6.2
1965	94.0	6.0

SOURCE: D.B.S., Motor Carriers - Freight, 1947, 1950, 1954, 1958, 1962, 1964 and 1965; Moving and Storage, Household Goods, 1962, 1964 and 1965.

OPERATING RATIOS, AND PER CENT NET OPERATING REVENUE OF TOTAL REVENUE, CARRIERS IN INTERCITY SERVICE EARNING $20,000 OR MORE ANNUALLY, CANADA, SELECTED YEARS

Year	Operating Ratio	Per Cent of Net Revenue of Total
1947	93.3	6.7
1950	92.5	7.5
1954	94.2	5.8
1958	94.5	5.5
1962	95.9	4.1
1964	94.7	5.3
1965	94.8	5.2

SOURCE: D.B.S., Motor Carriers - Freight, 1947, 1950, 1954, 1958, 1962, 1964 and 1965; Moving and Storage, Household Goods, 1962, 1964 and 1965.

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ASSETS, LIABILITIES AND OWNERS' EQUITY, INTERCITY FOR-HIRE CARRIERS EARNING $20,000 OR MORE ANNUALLY, CANADA, 1958 AND 1965 (1964 PERCENTAGES IN BRACKETS)

	1958		1965		(1964)
	Millions	Per Cent	Millions	Per Cent	Per Cent
Assets					
Current	$ 63.6	31.8	$138.0	31.7	(30.4)
Net Fixed (Motor Carrier)	115.0	57.4	222.9	51.2	(49.8)
Net Fixed (Other)	6.2	3.1	9.4	2.2	(2.1)
Other (e.g., Investments)	15.5	7.7	64.9	14.9	(17.7)
Total	$200.3	100.0	$435.2	100.0	(100.0)
Liabilities and Owners' Equity					
Liabilities:					
Current	$ 58.7	29.3	$137.7	31.6	(29.8)
Equipment Obligations and Other Long-Term Debt	44.4	22.2	110.1	25.3	(26.0)
Other (Reserves)	14.7	7.3	15.9	3.7	(3.6)
Owners' Equity:					
Capital Stock and Investment	32.1	16.0	71.4	16.4	(17.9)
Surplus	50.4	25.2	100.1	23.0	(22.7)
Total	$200.3	100.0	$435.2	100.0	(100.0)

NOTE: Balance sheet information is available from 1958 onward. It has been published for carriers earning $20,000 or more annually.

SOURCE: D.B.S., Motor Carriers - Freight, 1958, 1964 and 1965; Moving and Storage, Household Goods, 1964 and 1965.

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RETURN AFTER TAXES ON OWNERS' EQUITY FOR CARRIERS EARNING $20,000 OR MORE ANNUALLY, CANADA, 1958 AND 1965

	Millions	Percentage Return
1958		
Net Income	$ 12.2	
Owners' Equity	82.5	14.8
1965		
Net Income	$ 25.9	
Owners' Equity	171.1	15.1

SOURCE: D.B.S., Motor Carriers - Freight, 1958, and 1965; Moving and Storage, Household Goods, 1965.

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three sheets)

COMPARISON OF FINANCIAL DATA FOR ROAD, RAIL, AIR AND WATER TRANSPORT, AND OIL AND GAS PIPELINES, CANADA, 1964 AND 1965

The following financial comparison is limited because of lack of information and the varied situations existing for the different modes. For example, balance sheet data is published for motor carriers earning $20,000 or more annually, while it is not published for any water carriers.

As there is not a standard presentation of material, coverage for the various modes is as follows:

1. Motor carriers - those carriers earning $20,000 or more annually.

2. All railways - all carriers.

3. Air carriers - all schedule and non-schedule Canadian carriers.

4. Water - all carriers earning $50,000 or more annually.

5. Oil Pipelines - all carriers are included.

6. Gas Pipelines - all transport and distribution systems.

Further, as mentioned in Chapter II, in the railway industry an unusual situation exists in that the Canadian National earns some operating profit but is faced with heavy fixed charges. In a large number of the years since its incorporation, the Canadian National has shown a deficit, which has been borne by the Government of Canada. Whenever a surplus has been recorded by Canadian National, it has been paid into the Canadian Treasury. With this peculiar situation existing the "return" data for the railway industry is extremely low. In view of this, Canadian Pacific figures are also shown separately in this financial comparison.

There are two tables shown below. The first relates to revenues, expenses, operating ratios, and net income. The second relates to the distribution of total capital between loan capital and owners' equity or risk capital.

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three sheets)

OPERATING REVENUES, OPERATING EXPENSES, NET OPERATING REVENUE, NET INCOME, ROAD, RAIL, AIR AND WATER TRANSPORT, AND OIL AND GAS PIPELINES, CANADA, 1964 AND 1965 WHERE AVAILABLE

Mode	Operating Revenues		Operating Expenses	
	1964	1965	1964	1965
	Millions		Millions	
Road	$ 580.9	$ 697.0	$ 550.2	$ 660.5
Rail	1,454.6	1,510.1	1,363.6	1,420.2
C.P.R.	554.9	566.6	510.0	524.5
Air	334.9	393.6	315.6	368.2
Water	339.1	365.2	334.2	358.1
Oil Pipelines	138.5	145.8	54.3	57.2
Gas Pipelines	440.8	N/A	294.5	N/A

Mode	Net Operating Revenues		Net Income	
	1964	1965	1964	1965
	Millions		Millions	
Road	$ 30.7	$36.5	$22.6	$25.9
Rail	91.0	90.0	41.8	50.4
C.P.R.	44.9	42.1	58.6*	61.7*
Air	19.4	25.4	8.4	13.5
Water	5.0	7.1	17.8	20.9
Oil Pipelines	84.2	88.6	46.0	55.5
Gas Pipelines	146.3	N/A	68.3	N/A

NOTE: * Includes $23.8 million non-rail income for 1964 and $29.8 million for 1965.

SOURCE: D.B.S., Motor Carriers - Freight, Part I, pp. 13 and 23, Part II, pp. 10 and 17, 1964 and 1965; Moving and Storage, Household Goods, 1964 and 1965; Railway Transport, Part II, 1964, pp. 13, 31, 39, 41 and 48, 1965, pp. 15, 33, 41, 43 and 50; Civil Aviation, 1965 (Preliminary), p. 10, and 1966 (Preliminary), p. 10; Water Transportation, 1964 and 1965, p. 15; Oil Pipeline Transport, 1964 and 1965, p. 39; Gas Utilities (Transport and Distribution Systems), 1964.

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PERCENTAGE DISTRIBUTION OF CAPITAL FOR ROAD, RAIL, AIR AND WATER TRANSPORT, AND FOR OIL AND GAS PIPELINES, CANADA, 1964

Type of Capital	Road	Rail	Air *	Water	Oil Pipelines	Gas Pipelines
		Percentages				
Debt	39.0	61.8 C.P.R. (44.4)	86.0	N/A	63.1	70.4
Owners' Equity	61.0	38.2 C.P.R. (55.6)	14.0	N/A	36.9	29.6
Total	100.0	100.0	100.0	-	100.0	100.0

NOTE: Data for 1965 is not yet available for Air Transport and Gas Pipelines.

* Air Canada is financed almost completely on a debt basis.

SOURCE: D.B.S., Motor Carriers - Freight, 1964; Moving and Storage, Household Goods, 1964; Railway Transport, Part II, 1964; Civil Aviation, 1964; Water Transportation, 1964; Oil Pipeline Transport, 1964; Gas Utilities (Transport and Distribution Systems), 1964.

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AVERAGE RETURN ON OWNERS' EQUITY AND ON TOTAL INVESTED CAPITAL FOR MAJOR GROUPS OF CANADIAN COMPANIES WHICH EARNED A PROFIT IN 1964. FOR COMPARISON PURPOSES MOTOR TRANSPORT IS SHOWN SEPARATELY[1]

Group	Number of Profitable Companies	Net Income to Owners' Equity	Net Income to Total Capital
		Percentages	
Agriculture -	1,206	15.9	12.2
Forestry -	772	17.7	16.2
Fishing -	61	17.4	13.3
Mining, Oil and Quarrying -	721	5.3	5.2
Range[2] -		(2.2 to 15.3)	(2.2 to 13.4)
Manufacturing -	14,117	8.5	7.9
Range -		(3.2 to 21.8)	(3.4 to 20.9)
Construction -	9,345	16.2	15.1
Range -		(16.3 to 21.2)	(11.4 to 19.6)
Transportation, Storage, Communications and Utilities -	3,859	6.5	5.7
Range -		(3.4 to 24.3)	(3.4 to 20.1)
Wholesale Trade -	12,510	12.0	11.7
Range -		(7.2 to 15.2)	(7.2 to 14.5)
Retail Trade -	15,548	10.9	10.3
Range -		(8.9 to 15.5)	(8.5 to 15.2)
Services -	10,417	13.2	12.1
Range -		(6.2 to 23.0)	(6.1 to 22.4)
All Companies -	86,186	6.8	6.0
Motor Transport -	1,708	14.2	13.2

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two sheets)

NOTE: [1] Motor Transport is also included in the Transportation group.

[2] The range indicates the low and the high for individual industrial groups within the major group, e.g., in the Manufacturing group Petroleum Refineries showed 3.2 per cent return while Distilleries and Wineries showed 21.8 per cent return.

SOURCE: Canadian Imperial Bank of Commerce, "Newsletter," May, 1967. The data were extracted from "1966 Taxation Statistics, Part Two," published by the Department of National Revenue, Ottawa. Included are all companies with total assets of $1,000,000 or more, or taxable income of $50,000 or more. Otherwise, a sample is used. Approximately nineteen per cent of all Canadian corporation tax returns are included.

Appendix XXXVII

PROPORTIONS OF TRUCKS, TRACTORS AND TRAILERS OWNED AND LEASED BY CLASSES I, II AND III MOTOR CARRIERS, AND HOUSEHOLD GOODS MOVERS, CANADA, 1965

Vehicles	Class I	Class II	Class III	Household Goods
		Percentages		
Trucks:				
Owned	91.4	97.3	99.0	97.8
Leased	8.6	2.7	1.0	2.2
	100.0	100.0	100.0	100.0
Tractors:				
Owned	83.8	95.1	97.2	92.5
Leased	16.2	4.9	2.8	7.5
	100.0	100.0	100.0	100.0
Trailers:				
Owned	91.1	96.5	96.3	95.8
Leased	8.9	3.5	3.7	4.2
	100.0	100.0	100.0	100.0

SOURCE: D.B.S., Motor Carriers - Freight, 1965; Moving and Storage, Household Goods, 1965.

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DATA FOR REGRESSION AND CORRELATION OF INTERCITY NET TON MILES AND GROSS NATIONAL PRODUCT IN CURRENT DOLLARS, CANADA, 1939-1965

Year	Intercity Net Ton Miles	Gross National Product		
	Billions			
	Y	X	Y^2	X^2
1939	1.7	$ 5.6	2.89	31.36
1940	1.8	6.7	3.24	44.89
1941	2.2	8.3	4.84	68.89
1942	2.4	10.3	5.76	106.09
1943	2.5	11.1	6.25	123.21
1944	2.7	11.9	7.29	141.61
1945	3.0	11.8	9.00	139.24
1946	3.5	11.9	12.25	141.61
1947	4.3	13.2	18.49	174.24
1948	5.2	15.1	27.04	228.01
1949	5.9	16.3	34.81	265.69
1950	7.6	18.0	57.76	324.00
1951	8.2	21.2	67.24	449.44
1952	8.9	24.0	79.21	576.00
1953	9.8	25.0	96.04	625.00
1954	10.0	24.9	100.00	620.01
1955	10.3	27.1	106.09	734.41
1956	10.6	30.6	112.36	936.36
1957	10.7	31.9	114.49	1,017.61
1958	14.1	32.9	198.81	1,082.41
1959	14.4	34.9	207.36	1,218.01
1960	13.8	36.3	190.44	1,317.69
1961	16.1	37.5	259.21	1,406.25
1962	16.6	40.6	275.56	1,648.36
1963	16.7	43.4	278.89	1,883.56
1964	18.2	47.4	331.24	2,246.76
1965	19.4	52.0	376.36	2,704.00
Total	240.6	$649.9	2,982.92	20,254.71

SOURCE: D.B.S., Weekly Bulletin, February 17, 1967; National Accounts, 1926-1956, 1961, 1965.

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Year	XY	Y_c	d	d^2
1939	9.52	1.11	0.59	0.3481
1940	12.06	1.57	0.23	0.0529
1941	18.26	2.25	-0.05	0.0025
1942	24.72	3.10	-0.70	0.4900
1943	27.75	3.43	-0.93	0.8649
1944	32.13	3.77	-1.07	1.1449
1945	35.40	3.73	-0.73	0.5329
1946	41.65	3.77	-0.27	0.0729
1947	56.76	4.32	-0.02	0.0004
1948	78.52	5.12	0.08	0.0064
1949	96.17	5.63	0.27	0.0729
1950	136.80	6.35	1.25	1.5625
1951	173.84	7.70	0.50	0.2500
1952	213.60	8.88	0.02	0.0004
1953	245.00	9.30	0.50	0.2500
1954	249.00	9.26	0.74	0.5476
1955	279.13	10.19	0.11	0.0121
1956	324.36	11.66	-1.06	1.1236
1957	341.33	12.21	-1.51	2.2801
1958	463.89	12.63	1.47	2.1609
1959	502.56	13.48	0.92	0.8464
1960	500.94	14.07	-0.27	0.0729
1961	603.75	14.58	1.52	2.3104
1962	673.96	15.88	0.72	0.5184
1963	724.78	17.07	-0.37	0.1369
1964	862.68	18.75	-0.55	0.3025
1965	1,008.80	20.69	-1.29	1.6641
Total	7,737.36			17.6276

NOTE: Y_c - Theoretical Regression Values.

d - Deviation of Actual Values (Y)
From Theoretical Values (Y_c), $(Y-Y_c)$.

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LINE OF REGRESSION

To obtain the line of regression, which is linear, use equation $Y = a + bX$.

To obtain values of a and b use equations:

$$\begin{aligned} \text{I} \quad \textstyle\sum(Y) &= Na + b\textstyle\sum(X) \\ \text{II} \quad \textstyle\sum(XY) &= a\textstyle\sum(X) + b\textstyle\sum(X^2) \end{aligned}$$

Substituting:

$$\begin{aligned} \text{I} \quad 240.60 &= 27a + 649.9b \\ \text{II} \quad 7{,}737.36 &= 649.9a + 20{,}254.71b \end{aligned}$$

Subtracting I from II:

$$\begin{aligned} \text{II} \quad 7{,}737.36 &= 649.9a + 20{,}254.71b \\ - \text{I} \quad \underline{5{,}791.24} &= \underline{649.9a} + \underline{15{,}643.09b} \\ \underline{\underline{1{,}946.12}} &= \underline{\underline{-}} \quad \underline{\underline{4{,}611.62b}} \end{aligned}$$

$$b = \frac{1{,}946.12}{4{,}611.62} = \underline{\underline{.422}}$$

Substituting the value of b in equation I:

$$\begin{aligned} 240.60 &= 27a + 649.9\ (.422) \\ 240.60 &= 27a + 274.2578 \\ 27a &= 240.60 - 274.2578 \\ 27a &= -33.6578 \\ a &= \underline{\underline{-1.25}} \end{aligned}$$

Line of regression $Y_c = -1.25 + .422X$

Where Y_c = The theoretical Net Ton Miles in billions.
X = The Gross National Product in billions.

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seven sheets)

COEFFICIENT OF CORRELATION

To calculate the coefficient of correlation the standard deviation and standard error of estimate are required.

Standard Deviation:

This measurement indicates the variation about the arithmetic mean.

Use Formula:

$$\sigma_y = \sqrt{\frac{\sum(Y^2)}{N} - \left(\frac{\sum Y}{N}\right)^2}$$

Substituting:

$$\sigma_y = \sqrt{\frac{2,982.92}{27} - \left(\frac{240.6}{27}\right)^2}$$

$$\sigma_y = \sqrt{110.48 - 79.41}$$

$$\sigma_y = \sqrt{31.07}$$

$$\sigma_y = \underline{5.57}$$

Standard Error of Estimate:

This measurement indicates the variation or scatter about the line of regression.

Use Formula:

$$S_y = \sqrt{\frac{\sum(d^2)}{N}}$$

Substituting:

$$S_y = \sqrt{\frac{17.6276}{27}}$$

$$S_y = \sqrt{.6529}$$

$$S_y = \underline{.8080}$$

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seven sheets)

Calculation of Coefficient of Correlation:

This measure indicates the comparative association between two statistical series.

Use Formula:

$$r = \sqrt{1 - \frac{s_y^2}{\sigma_y^2}}$$

Substituting:

$$r = \sqrt{1 - \frac{.8080}{5.57}}$$

$$r = \sqrt{.8549}$$

$$r = .925$$

Appendix XXXVIII
(Sheet six of
seven sheets)

PROJECTED ESTIMATES

Following is a projection of intercity net ton miles for road transport based on $Y_c = -1.25 + .422X$:

Year	X	Y_c
	Billions	
1966	$57.8	23.1
1967	61.9	24.9
1968	66.2	26.7
1969	70.8	28.6
1970	75.8	30.7
1971	80.9	32.9
1972	86.4	35.2

SOURCE: The 1966 Gross National Product was available from the D.B.S., Monthly Review for May, 1967. For the years 1967 to 1972, a 7.0 per cent increase was originally shown. This decision was based on information received from Mr. A.S. Rubinoff, Director, Economic Analysis Division, Department of Finance, Ottawa, in a letter to the writer, dated March 30, 1967. The request made by the writer, was for a projection of the Gross National Product in current dollars to about 1972. Mr. Rubinoff's letter stated in part:

> There are no official Government of Canada projections available. However, you could draw upon the work of the Economic Council of Canada which you mentioned in your letter, as well as some material given in Volume II of the Report of the Royal Commission on Taxation. In round terms, both of these sources yield an increase in potential Gross National Product in real terms of about 5 per cent per annum until 1970. No detailed work has been carried on for subsequent years, but depending upon the purpose to which you wish to put the material, you might consider using the same annual increase for two or three years past 1970. Most projection work that has been done has been done in constant prices. The development of prices in Canada depends to a very considerable extent on developments elsewhere, which are extremely difficult

to predict. The Economic Council of Canada in its First Annual Review described the period from 1953 to 1963 as being one of reasonable price stability. During these years the average increase in the GNP deflator amounted to just slightly less than 2 per cent per annum.

In view of the above, it was decided to use a 7.0 per cent increase, as probably this would be as close an estimate as might be made.

On September 17, 1967, the Fourth Annual Review of the Economic Council of Canada was released. The forecast of growth in G.N.P. in constant dollars to 1970, was projected as 5.0 per cent a year. For 1971 to 1975 the annual growth suggested was 4.75 per cent. Therefore, in this study growth in the G.N.P. for 1971 and 1972 in current dollars has been projected on the basis of 6.75 per cent.

Appendix XXXIX
(Sheet one of
six sheets)

MATHEMATICAL PROJECTIONS OF NET TON MILES FOR FOR-HIRE, PRIVATE INTERCITY, FARM AND URBAN TRUCKS, AND FOR-HIRE REVENUE, BASED ON THE ANNUAL GEOMETRIC INCREASE FROM 1957 TO 1963, CANADA, 1964-1972

Use Formula $Y = ab^x$

For Net Ton Miles:

Y = Billions of net ton miles each year

a = Billions of net ton miles - 1957

b = One plus the annual percentage increase expressed in decimals

x = Number of years

For For-Hire Revenue:

Y = Millions of dollars

a = Millions of dollars - 1957

b = One plus the annual percentage increase expressed in decimals

x = Number of years

NOTE: The figures which follow have been rounded in most instances.

The net ton mile and revenue data used in the following calculations were obtained from D.B.S., Motor Transport Traffic, National Estimates, 1958 and 1963.

Appendix XXXIX
(Sheet two of
six sheets)

FOR-HIRE

Net Ton Miles - Billions

1957 - 6.7
1963 - 12.0

Calculation of Increase:

Solving for a:

$Y = ab^x$

$6.7 = ab^0$

$\therefore a = 6.7$

Solving for b:

$Y = ab^x$

Substituting $12.0 = 6.7\ b^6$

Rearrange $b^6 = \frac{12.0}{6.7}$

or $\log b^6 = \log 12.0 - \log 6.7$

Whence $\log b = \frac{\log 12.0 - \log 6.7}{6}$

$\log b = \frac{1.079181 - 0.826075}{6}$

$\log b = 0.042184$

$b = 1.102$

Annual geometric increase - 10.2 per cent

Application of Increase of 10.2 per cent for projection - applied to 1963 data and projected forward to 1972:

	Billion Net Ton Miles
1963 -	12.0
1964 -	13.2
1965 -	14.6
1966 -	16.1
1967 -	17.7
1968 -	19.5
1969 -	21.5
1970 -	23.7
1971 -	26.1
1972 -	28.8

1972	28.800
Add: Proportionate difference of 0.2 billion net ton miles between regression and geometric projections	0.184
	28.984
or	29.0

Appendix XXXIX
(Sheet three of
six sheets)

PRIVATE INTERCITY TRUCKS

Net Ton Miles - Billions

1957 - 3.6
1963 - 4.3

Calculation of Increase:

Solving for a:

$Y = ab^x$

$3.6 = ab^0$

$\therefore a = 3.6$

Solving for b:

$Y = ab^x$

Substituting $4.3 = 3.6\ b^6$

Rearrange $b^6 = \frac{4.3}{3.6}$

or $\log b^6 = \log 4.3 - \log 3.6$

Whence $\log b = \frac{\log 4.3 - \log 3.6}{6}$

$\log b = \frac{0.633468 - 0.556303}{6}$

$\log b = 0.012860$

$b = 1.030$

Annual geometric increase - 3.0 per cent

Application of Increase of 3.0 per cent for projection - applied to 1963 data and projected forward to 1972:

	Billion Net Ton Miles
1963 -	4.3
1964 -	4.4
1965 -	4.5
1966 -	4.6
1967 -	4.7
1968 -	4.8
1969 -	4.9
1970 -	5.1
1971 -	5.3
1972 -	5.5

1972 ..... 5.500

Add: Proportionate difference of 0.2 billion net ton miles between regression and geometric projections 0.014

5.514

or 5.5

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(Sheet four of
six sheets)

FARM TRUCKS

Net Ton Miles - Billions

1957 - 0.4
1963 - 0.5

Calculation of Increase:

Solving for a:

$Y = ab^x$

$0.4 = ab^0$

$\therefore a = 0.4$

Solving for b:

$Y = ab^x$

Substituting $0.5 = 0.4\ b^6$

Rearrange $b^6 = \frac{0.5}{0.4}$

or $\log b^6 = \log 0.5 - \log 0.4$

Whence $\log b = \frac{\log 0.5 - \log 0.4}{6}$

$\log b = \frac{0.698970 - 0.602060}{6}$

$\log b = 0.016151$

$b = 1.038$

Annual geometric increase - 3.8 per cent

Application of Increase of 3.8 per cent for projection - applied to 1963 data and projected forward to 1972:

	Billion Net Ton Miles
1963 -	0.50
1964 -	0.52
1965 -	0.54
1966 -	0.56
1967 -	0.58
1968 -	0.60
1969 -	0.63
1970 -	0.65
1971 -	0.68
1972 -	0.71

1972	0.710
Add: Proportionate difference of 0.2 billion net ton miles between regression and geometric projections	0.002
	0.712
or	0.7

Appendix XXXIX
(Sheet five of
six sheets)

URBAN TRUCKS

Net Ton Miles - Billions

1957 - 1.3
1963 - 1.9

Calculation of Increase:

Solving for a:

$Y = ab^x$

$1.3 = ab^0$

$\therefore a = 1.3$

Solving for b:

$Y = ab^x$

Substituting $1.9 = 1.3\ b^6$

Rearrange $b^6 = \frac{1.9}{1.3}$

or $\log b^6 = \log 1.9 - \log 1.3$

Whence $\log b = \frac{\log 1.9 - \log 1.3}{6}$

$\log b = \frac{0.278754 - 0.113943}{6}$

$\log b = 0.027468$

$b = 1.065$

Annual geometric increase - 6.5 per cent

Application of Increase of 6.5 per cent for projection - applied to 1963 data and projected forward to 1972:

	Billion Net Ton Miles
1963 -	1.9
1964 -	2.0
1965 -	2.2
1966 -	2.3
1967 -	2.4
1968 -	2.6
1969 -	2.7
1970 -	3.0
1971 -	3.2
1972 -	3.4

Appendix XXXIX
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FOR-HIRE REVENUE

Use formula $Y = ab^x$

Where Y = Millions of dollars
a = Millions of dollars - 1957
b = One plus the annual percentage increase expressed in decimals
x = Number of years

	Millions
1957 -	$490.9
1963 -	818.9

Calculation of Increase:

Solving for a:

$Y = ab^x$

$490.9 = ab^0$

$\therefore a = 490.9$

Solving for b:

$Y = ab^x$

Substituting $818.9 = 490.9\ b^6$

Rearrange $b^6 = \frac{818.9}{490.9}$

or $\log b^6 = \log 818.9 - \log 490.9$

Whence $\log b = \frac{\log 818.9 - \log 490.9}{6}$

$\log b = \frac{2.913231 - 2.690993}{6}$

$\log b = 0.037040$

$b = 1.089$

Annual geometric increase - 8.9 per cent

Application of Increase of 8.9 per cent for projection - applied to 1963 data and projected forward to 1972:

	Millions		Millions
1963 -	$ 818.9	1968 -	$1,254.2
1964 -	891.8	1969 -	1,365.8
1965 -	971.2	1970 -	1,487.4
1966 -	1,057.6	1971 -	1,619.8
1967 -	1,151.7	1972 -	1,764.0

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