

# Piggyback Transportation in Canada

*by*

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# Piggyback Transportation in Canada

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## Introduction

Transportation in Canada has been changing from a general purpose system to one of specialized services. In the past all types of commodities were shipped by rail—oil, coal, cattle, manufactured goods in crates and so on. But today the new transport media are specialized. Each carries a particular kind of freight more effectively than railways or other methods can. Trucks take the high-value, high-rate traffic that demands speed and directness. Lake and seaway carriers take much of the low-cost, mass transportation business. Pipelines are most specialized of all, carrying only liquid and gaseous fuels in one direction only.

To the railways, in this new competition for traffic there remains a large volume of bulk freight like coal, iron ore, wheat for export, and such, as well as a substantial volume of general freight traffic (mostly manufactured and miscellaneous). This railway traffic is mainly freight which requires fairly long hauls. But in recent years a significant part of this longer haul traffic has been eroded away by the competition of trucks. The railways in Canada have made tremendous efforts to improve their transport services and to develop ways of meeting this competitive threat to this, their most profitable, freight traffic. The development of piggyback is one of the most promising of these new railway methods.

Piggyback operations consist of using a highway tractor and trailer to pick up freight, transferring the loaded trailer to a railway flatcar for line-haul transportation between origin and destination, and delivering the goods by highway tractor from the piggyback terminal. This is trailer-on-flatcar (TOFC) service, more commonly called piggyback.

To place it in perspective, piggyback should not be viewed as a special or isolated development but as one of a number of innovations adopted by the railways in recent years to cut their operating costs and improve freight services.<sup>1</sup> It has been viewed by the railways as one of the brightest spots in their over-all modernization program. Its growth is said to have enabled them to stop losses of traffic to trucks and to recover some of the traffic they had already lost.

The basis for the growth of piggyback lies in the increased demand by shippers for improved and specialized transport services and the defects

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<sup>1</sup> Most railway improvements have been by way of cost-reducing innovations.

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that have become apparent in traditional railway methods<sup>1</sup> of servicing freight shipments. Such railway methods have become too costly (freight handled through sheds, box cars, etc., may require four to six handlings or more compared with two for trucking); too slow (switching and classification at origin and destination plus dropping off carloads here and there at intervening points, commonly take as much or more time than the line haul); too impersonal and generalized (damage, loss and pilferage are reported to be greater than with piggyback or highway transport); and lacking in those special services designed to meet the particular requirements of individual shippers (railways have established mainly general purpose freight services and schedules with the object of meeting the average needs of all shippers and shippers have accordingly had to adapt to these railway services rather than *vice versa*).

These disadvantages of railway freight services have resulted in a large and growing loss of general freight traffic to the trucking industry. These service disadvantages have been sufficiently important to some shippers to outweigh rate advantages that lower line-haul costs by rail may offer them. The result: such shippers have been turning more and more toward trucking services.

Piggyback opened the way for the railways to stop some of this loss of traffic to trucks. Low line-haul rail costs are reported to be the main factor supporting this new opportunity for rail competition. The opportunities in piggyback lie primarily in combining the speed and service advantages of trucking with the low line-haul costs of rail transport. In other words, to use highway transport for pick-up and delivery and trains to haul the trailers from terminal to terminal.

Yet the appraisal of the possibilities for TOFC service to compete extensively with the specialized services provided by trucks or other transport requires careful analysis. Early enthusiasm for rail piggyback has stemmed to a large extent from its many advantages over conventional box car methods. It has not always been recognized that piggyback has relatively few advantages and some major disadvantages relative to highway trucking, its strongest competitor.<sup>2</sup> In the railways' drive to improve efficiency and service in the face of low profits and strong competition from truckers and the Seaway, piggyback has promised to play an important part in the over-all

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<sup>1</sup> This applies more to the methods used for handling class freight traffic than to bulk commodities like grain, coal or ore, which are commonly loaded and unloaded by efficient mechanical means and, being moved mainly by the trainload, can proceed directly from origin to destination without costly delays en route in passing through classification yards, dropping off cars at intervening points, etc., such as occurs with general freight traffic.

<sup>2</sup> It will be shown below that piggyback has some substantial disadvantages in competing with truck transport. These limitations are not always recognized. See, for example, Meyer, *et al.*, p. 150, "The basic difference between truck and piggyback movement is the differential between rail and truck line-haul expenses". This overlooks some very important considerations.

railway improvement.<sup>1</sup> This is because most railway improvements have been focussed on reducing costs, e.g., dieselization, new classification yards, etc., while piggyback was expected primarily to fill the widening gap in services between box car and trucking, thus meeting the most important weakness in competitive rail operations.<sup>2</sup>

Another consideration is that conditions for piggyback in Canada differ markedly from those in the United States. Its potential in Canada must accordingly be assessed independently in many respects of the experience in the United States.

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<sup>1</sup>This is illustrated also in *The Economics of Competition in the Transportation Industries*, by J. R. Meyer, et al., Cambridge, 1959, p. 110, where it states, "Piggyback is . . . a new concept in railroading. (It) allows the radical simplification of railroad operations, switching on the ground, highway movement on low traffic density pickup and delivery operations, and the bypassing of freight sheds and team tracks. Unless these new practices are adopted, piggyback will be simply a more expensive and colorful version of conventional railroad transportation".

<sup>2</sup>Professor A. W. Currie has suggested that piggyback, now the focus of attention, is only one part of the over-all revolution that is taking place in the whole transportation picture at this time. See *Canadian Transportation*, April, 1959, p. 35. To the railways, piggyback has seemed of key significance because of this vista of improved service, competitive with trucks, that it opens to them. See, for example, N. R. Crump in *Monetary Times Annual*, 1959, p. 114.

## Development of Piggyback in Canada

### *Growth of Piggyback*

Piggyback is not new in Canada. It started as early as 1858, when the Windsor branch of the Nova Scotia Railway opened. Piggyback provided 15 per cent of that Railway's revenue in the beginning. At that time, farmers' wagons were lashed on flatcars to carry produce from Windsor to Halifax. The horses were carried on the same train in box cars.

Today the power units usually stay at home. Only the highway trailer is hauled by rail. This modern type of TOFC service began in Canada almost a hundred years later, in 1952, and then only in a small way. In the United States, on the other hand, some railroads had begun developing it in the late 1930's. The Canadian development started with the two railways carrying their own trailers in 1952. It grew slowly until the fall of 1957. In October of that year the CPR and CNR began carrying trailers for highway common carriers. From that time on, growth in piggyback has been rapid.

Records of this growth are available from January, 1958. These show that, starting with the 3,932 railway flatcars loaded in piggyback service in the first month of record, January, 1958, loadings rose to 16,288 cars a month by April, 1960, but declined thereafter and had not again recovered that level by May, 1961.

RAILWAY CARS LOADED IN PIGGYBACK SERVICE IN CANADA,  
BY MONTHS<sup>1</sup>

	1958	1959	1960	1961
January .....	3,932	7,811	9,471	10,502
February .....	3,861	7,772	10,674	10,809
March .....	5,435	10,513	13,126	13,632
April .....	7,047	11,965	16,288	14,576
May .....	6,978	11,549	14,801	15,472
June .....	6,163	11,832	13,605	
July .....	6,439	12,210	12,581	
August .....	6,401	10,595	13,491	
September .....	7,693	12,365	13,778	
October .....	7,964	13,036	12,935	
November .....	7,269	12,407	12,265	
December .....	7,927	11,874	11,884	
Total .....	77,109	133,929	154,898	
Monthly Average .....	6,426	11,161	12,908	

<sup>1</sup> Dominion Bureau of Statistics.

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This remarkable fourfold increase during the first two and a half years of record raised piggyback in Canada to a relatively more important role than it had achieved in its much longer period of development in the United States. By the end of 1960, TOFC loadings comprised almost 4.3 per cent of total railway carloadings in Canada. In the United States they had reached only 1.82 per cent of total carloadings.

Year	Canada <sup>1</sup>			United States <sup>1</sup>		
	Total cars loaded	TOFC cars loaded	TOFC per cent of total	Total cars loaded	TOFC cars loaded	TOFC per cent of total
	(thousands)			(thousands)		
1955 .....	4,065.6	....	....	37,636.0	168.1	0.45
1956 .....	4,402.8	....	....	37,844.8	207.8	0.55
1957 .....	4,036.8	....	....	35,500.1	249.1	0.70
1958 .....	3,771.0	77.1	2.00	30,222.1	276.8	0.91
1959 .....	3,854.9	133.9	3.50	31,014.5	416.5	1.34
1960 .....	3,635.4	154.9	4.26	30,439.6	554.2	1.82

<sup>1</sup> Source: Dominion Bureau of Statistics and Association of American Railroads, Car Service Division. Some allowance should be made for the greater proportion of piggyback flatcars which carry two trailers piggyback in the U.S. than in Canada. Thus, in trailers handled, the above estimates of U.S. carloadings might under-estimate U.S. piggyback by 10 to 20 per cent relative to Canada's loadings. This would, of course, leave Canada still well ahead proportionally.

In Canada, piggyback service is provided by the CPR and the CNR while the PGER provides service for truckers' trailers only. In the United States, 50 railroads, in 50 states, and operating 86 per cent of the railway tracks, had piggyback service in 1960.

The CPR has become the largest piggyback carrier in the world. It carried 24,000 trailers on flatcars in 1957, 62,000 in 1958 and 101,600 in 1959.<sup>1</sup> In 1960, CPR piggyback made a small gain over 1959. The CPR was providing about two-thirds of the piggyback service in Canada in 1960 but there was some evidence in that year that the CNR was beginning to gain a larger share of TOFC traffic than it had in the past.

In 1960, about 25 per cent of the total trailers shipped by piggyback were owned directly by the CNR or CPR. The other 75 per cent of the trailers carried by these two railways were owned by for-hire trucking firms including such firms like Smith Transport, which were subsidiaries of the railways. The CNR handled almost as many rail-owned as trucker-owned trailers. But the CPR handled only about one of its own trailers for every

<sup>1</sup> Annual reports, Canadian Pacific Railway. Common carrier piggyback services added \$4.5 million to CPR freight revenues in 1958 and 780,000 tons to the freight handled.

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five carried for trucking firms. Thus the CPR carried much the largest share of trailers for trucking companies, but the CNR carried the largest share of rail-owned trailers.

Progress in piggyback in Canada has been substantial for the short period of its development. This growth has been more rapid in Canada than in the United States. Opportunities for its development, especially to serve for-hire truckers, have been greater and the planning of its development has been somewhat more effective in Canada. The nature of this planning and organization is examined next.

### *Routes Served*

Although piggyback services were not inaugurated in Canada until 1952, independent trucking companies had tried unsuccessfully from the late 1930's to negotiate piggyback arrangements with the two major railways. In almost every case such negotiations involved the Montreal-Toronto run where so much highway congestion existed.<sup>1</sup> Until 1957 the railways declined to offer such piggyback service.

In 1952, the CNR and CPR began carrying their own trailers between Montreal and Toronto. Full information on the numbers of trailers hauled in this period is not available but the evidence indicates that the growth of this service was quite slow.

In the meantime, the CNR joined with the CPR in making a survey of the volume tonnage on the highways together with a study of rail versus truck costs. Apparently primary attention in the study was given to "the most prolific area of highway (rail) competition in Canada . . . notably between Toronto and Montreal".<sup>2</sup>

In 1957, two events occurred which stimulated TOFC both in numbers of routes covered and in trailers hauled. One was the purchase of Smithson's Holdings Ltd., owner of the largest trucking business in Canada, by the CPR. The other was the application by eight major trucking firms to the CPR and CNR for piggyback services between Montreal and Toronto.<sup>3</sup> The transfer of Smithson's Holdings to the CPR was completed in 1958. It gave the CPR established truck services from Manitoba to Nova Scotia, some of which could be shared with piggyback. The application for TOFC service by the eight for-hire trucking firms was approved on August 1, 1957. This TOFC service

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<sup>1</sup> See *Transport Release* of Canadian Trucking Associations, Inc., August 2, 1957.

<sup>2</sup> See H. B. Parr, assistant freight traffic manager, CNR, in *Railway Age*, January 13, 1958, p. 16.

<sup>3</sup> Smith Transport, a subsidiary of Smithson's Holdings Ltd., was one of the eight. The others were: Asbestos Transport, Direct Winters Transport, Husband Transport, Inter-City Truck Lines, Kingsway Transports, Motorways (Quebec) and Reliable Transport.



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began on October 8, 1957, and was an immediate and mutual success.<sup>1</sup> Within two years it enabled the CPR to carry more trailers than any railway in the world. CNR for-hire piggyback grew rapidly also.

With this beginning piggyback was rapidly extended by the railways. Highlights of the CNR development indicate the pattern:

- |                |   |
|----------------|---|
| July 14, 1958  | Piggyback inaugurated between Central Canada and the Maritimes.   |
| February, 1959 | For-hire piggyback Montreal-Ottawa-Toronto-London, Port Arthur-Winnipeg.  |
| February, 1959 | For-hire piggyback services extended to serve 11 western cities including Winnipeg, Regina, Saskatoon, Calgary, Edmonton and Vancouver. |
| March 9, 1959  | Coast-to-coast piggyback for moving vans with household goods.  |
| March 23, 1959 | International piggyback between Toronto and New York and New Jersey jointly with Delaware Lackawanna.                                   |
| May 15, 1959   | Piggyback service between Montreal and Fredericton, N.B.  |
| July 7, 1959   | Complete trucks including tractors with trailers carried between Moncton and Halifax.   |
| July 20, 1959  | Specific cargoes (e.g., chemicals, etc.) carried in company-owned trailers between Sarnia and Montreal.                                 |

The CPR development followed a similar pattern but was somewhat more extensive. Being supported by a very large trucking organization, CPR piggyback grew more rapidly than the CNR.<sup>2</sup> In December, 1959, President N. R. Crump announced that piggyback service covered 6,000 CPR route miles and was available from the Atlantic to the Pacific.<sup>3</sup> At that time it was serving 21 cities. By May, 1960, this had increased to 25 cities. For-hire common carriers were offered CPR piggyback service at the following points—St. John, Fredericton, Aroostook (Maine), Quebec, Montreal, Ottawa, Toronto, Fort William, Dryden, Winnipeg, Regina, Saskatoon, Medicine Hat, Lethbridge, Calgary, Edmonton and Vancouver. Other cities were served by rail-owned piggyback service only.

With its own trailers, the CPR offers piggyback services between Montreal, Toronto, Hamilton and London. In Western Canada, trailers belonging to the CPR subsidiaries Canadian Pacific Transport, Dench and O.K. Valley Freight (operating as for-hire trucking firms), are carried between Winnipeg, Brandon, Regina, Saskatoon, Swift Current, Medicine Hat, Lethbridge, Calgary, Edmonton, Red Deer and Vancouver.

<sup>1</sup> Assistant general manager W. J. Hines of Kingsway Transports Ltd. called this 1957 agreement for hauling "for-hire" trailers "a mile-stone in Canadian transportation history. It provided benefits to all concerned and showed co-operation is possible." *Canadian Transportation*, August, 1959, p. 37.

<sup>2</sup> Recent purchases by the CNR of several trucking companies will undoubtedly increase piggyback loadings substantially.

<sup>3</sup>*Monetary Times*, Annual National Review, 1960, p. 95-96.

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In total, 84 piggyback routes are operated by the CPR.

The Pacific Great Eastern Railway in British Columbia provides piggyback service between North Vancouver and Dawson Creek for for-hire common carriers.

The greatest growth of piggyback has been in areas where traffic volume was heaviest. By 1960, about 85 per cent of total TOFC loadings were in Eastern Canada and the balance in Western Canada. Nearly half the total loadings were in providing piggyback service between Montreal and Toronto.

Except for the Maritimes, piggyback thus far is mainly an intra-regional service rather than interregional. Of the total TOFC loadings in Central Canada in 1960 (these Ontario and Quebec loadings were 81 per cent of total TOFC handlings in Canada) only an estimated 9 per cent went outside the two central provinces. Similarly, in Western Canada, only about 20 per cent of TOFC loadings there were for destinations outside that region. In the Maritimes about 80 per cent of the 1960 loadings were for destinations outside the Maritimes, mostly to Central Canada. But total TOFC loadings in the Maritimes were a relatively small part of the total for Canada, i.e., about 4 per cent.<sup>1</sup>

Most of the piggyback movements in Canada are concentrated within the central industrial complex included in the metropolitan areas of Montreal, Toronto, Hamilton, Windsor, Sarnia and London. Thus it is mainly a short to medium distance service rather than long haul.

But TOFC service, whether it serves the short-haul intensive transportation needs of a highly industrialized region or the long-haul needs of interregional transport in Canada, is almost exclusively a city-to-city service. As it has been designed it provides mainly trainload piggyback service between industrial cities. It does not serve the intervening stations between these major industrial centres. Thus the CPR with some 6,000 miles of piggyback routes serves some 25 cities.

This terminal-to-terminal service is significant because to the extent TOFC takes over freight traffic from railway box car services it can be expected to expand the role of trucking in the over-all transportation operation. The pick-up and delivery range of feeder trucking has necessarily extended to cover these intervening points. The growth of piggyback has in this way stimulated a related growth in short- and medium-haul trucking. There may be a similar stimulus to long-haul trucking, because piggyback terminal-to-terminal service will give a time and distance advantage to direct truck

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<sup>1</sup> In 1960, the CNR was providing TOFC service out of the Maritimes only for rail-owned trailers. In Western Canada, no rail-owned TOFC service was provided by the CNR but trailers for for-hire trucking firms were carried. The CPR carried for-hire trailers for all regions but its TOFC service with rail-owned trailers was negligible in Western Canada and the Maritimes.

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service to areas, surrounding the point of piggyback delivery, which are nearer to the point of origin.

### *Piggyback Plans*

Although piggyback routes and facilities are expanding rapidly, only two of the five well-known United States plans are fully in operation in Canada. This limitation of plans may be partly attributed to the railways owning some of the major trucking companies.<sup>1</sup> Briefly, the five U.S. plans may be described as follows:<sup>2</sup>

- I The railway supplies the flatcars and the service, the for-hire highway carriers provide only the trailer to be shipped.
- II The railways handle their own trailers.
- III Like I, but the trailers belong to private carriers or shippers.
- IV The shipper provides both the trailer and flatcars.
- V Involves joint rail-truck rates that permit the railway or the highway carrier to take shipments originating in, or going to, the other's territory. This plan is more significant for the United States where more interlining is necessary than in Canada.

Plan II under which the railways handle their own trailers began first in Canada in 1952. It grew slowly in the early stages. More recently it was being integrated and co-ordinated into the railways' general merchandising services and its use has been expanding steadily.

Plan I for carrying for-hire trailers has had a more rapid growth in Canada than Plan II and is reported to be making profitable additions to railway revenues. By 1960, it was providing about 75 per cent of the total TOFC service in Canada, with Plan II contributing the other 25 per cent.<sup>3</sup> Plan I is not open to all truckers. So far it has been limited to those truckers with established highway routes between the points served by piggyback. The tariff for Plan I (No. 38D) restricts the service to for-hire trailers of truckers who hold the required licences for the route and who have made prior contracts with the railway companies. In the main, agreements are made only with the larger truckers. Truckers not served have claimed these agreements represent discrimination by the railways, though this has not yet been tested in the courts.

Plans III and IV for carrying trailers owned by shippers are still under study in Canada. A number of shippers have shown interest in making

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<sup>1</sup> See *Canadian Transportation*, January, 1960, statement by A. E. Jenner, manager, piggyback services, for CPR, p. 31.

<sup>2</sup> See Appendix A for a full description of these five U.S. plans. A sixth plan involving use of trailers for L.C.L. shipments has also recently been used in the United States.

<sup>3</sup> Of this 75 per cent of total TOFC service, provided under Plan I to for-hire trucking, about one-third was for for-hire trucking firms owned by the railways.

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Plan III arrangements but thus far such movements have been largely trial shipments.

As for the railways, both have had exploratory talks with shippers on Plans III and IV. But both have stated they are highly satisfied with the way Plans I and II are working out. By confining piggyback service to these two plans Canada's railways may hope to serve the whole transport needs of such shippers rather than just the piggyback portion.<sup>1</sup> This appears to be the trend in auto transport operations. The CPR, for example, recently developed a new 40-foot trailer (Car-A-Van) that will carry four new cars outbound and general merchandise on the backhaul. Smith Transport began using it in the fall of 1959 on piggyback service. The auto manufacturers have handled their own transport in the past as a one-way operation. The new Car-A-Van is expected to provide two-way economy by cutting line-haul costs via piggyback and providing a return cargo where highway auto transporters had ordinarily returned empty. A big demand is anticipated for auto shipments to Western Canada, using this service.

With the development of the St. Lawrence Seaway and the purchase by Canada Steamship Lines of Kingsway Transports, Gossett and Sons and Arrow Transit, it was widely expected that "fishyback", i.e., carrying trailers on water transport, would develop rapidly. This plan has not shown much growth yet, however. Part of the explanation may lie in the need to remodel existing ships in order to utilize the stowage space effectively with trailers. Some vessels, chiefly in the United States, have already been modified in this way at considerable expense. Evidence suggests it may be more economical to build the ships especially for receiving trailers and other containers. Not much progress has been made yet in building Canadian ships for carrying trailers or containers but recent developments in U.S. shipbuilding indicate that future construction of package freight water carriers may well emphasize this feature.

## *Equipment and Facilities*

The major features of piggyback equipment and facilities are their simplicity and economy relative to the requirements of conventional freight services. The nature of the operations show this. This is indicated by TOFC operations. Highway tractors haul the trailers to the piggyback terminal and back them up ramps onto flatcars (each track may hold 5 to 12 or more

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<sup>1</sup>A major railway problem in the U.S. is the increasing proportion of freight being carried by private shippers in their own or leased equipment. An ICC survey, reported in 1958, showed 201 of 325 manufacturers queried do their own trucking and 40 more planned to do so. It also showed that railways got 24 per cent of the freight transportation dollar and highway common carriers 39 per cent, while 26 per cent went to private, co-operative and contract carriers. *Barron's*, August 4, 1958, p. 3.

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cars) (Figure 1). A two-man crew anchoring the trailers can handle up to five such ramps. The loaded piggyback flatcars being directly classified as they are loaded can then be combined into trains, moved to the departure yard and put behind fast freight or passenger locomotives (Figure 2).

Thus the main essentials for a piggyback terminal are a supply of flatcars equipped with a trailer hitch, a rail siding with a simple loading ramp at the end and a parking area. These can ordinarily be installed at relatively low cost. A recent U.S. study compared the installations and costs at the Kearney, N.J., TrucTrain terminal with the standard industrial terminal area at Trenton, N.J. Both handle roughly the same amount of freight. The piggyback terminal included 19,700 feet of track and 15 turnouts (switches). The standard terminal had 185,530 feet of track and 265 turnouts. At current prices, track and turnouts in the Kearney piggyback terminal were estimated to cost \$279,039 and those at Trenton \$3,031,645, more than ten times as much.<sup>1</sup> In addition a great deal less labour would be required to handle the same freight through the piggyback terminal. These low investment and handling costs for piggyback terminals offer the railways a major opportunity for savings.<sup>2</sup> There may be savings in line-haul costs also.

Piggyback terminals are now being located on the outskirts of cities at points convenient to major highways so the trucking end of the operation can be expedited. So far, end-loading from ramps has been found most efficient. Side-loading, in some cases with fork-lifts, has been tried but efficient and economical containers, flatcars and loading equipment for this method are still to be perfected. Considerable research is being done on this by the railways, however.<sup>3</sup>

In flatcars for piggyback, the Canadian railways have taken a very practical approach, keeping costs low by adapting flats primarily to handle standard highway trailers. As noted below, this was in marked contrast to the U.S. railways' approach.

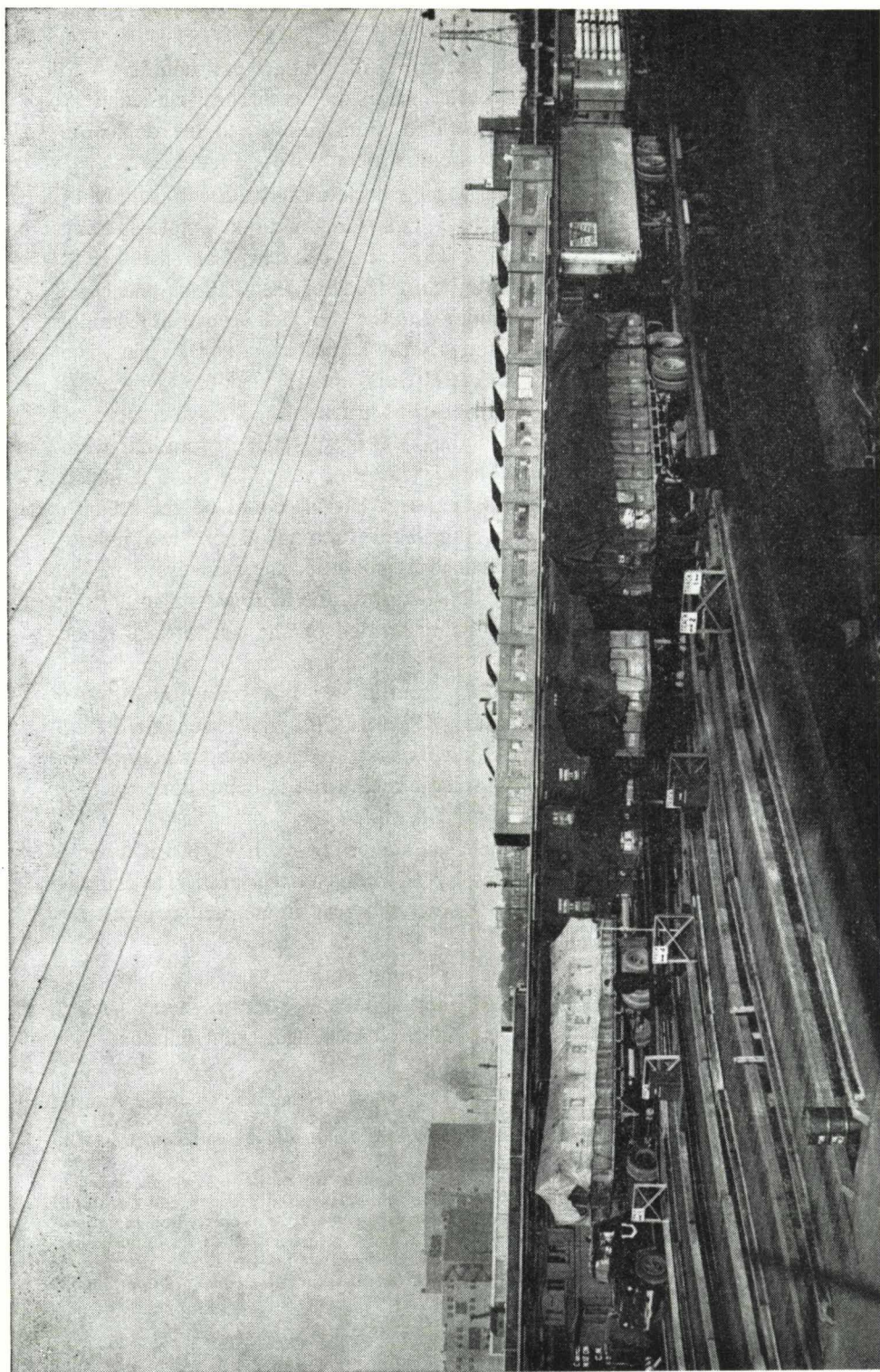
Both CPR and CNR began by using standard flatcars with the simplest possible modifications—ACF hitch suitable for any highway trailer (Figure 3), guide rails at the sides and a short hinged gangplank at the

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<sup>1</sup> *Brief of Defendant Railroads*, p. 52-59, *The Eastern Central Motor Carriers Association, Inc., v. The Baltimore and Ohio Railroad Company, et al.*, ICC Docket No. 32533, *et al.*, 7/1/59, as quoted in *Piggyback and the Future of Railroad Transportation*, by John G. Shott, Washington, 1960, p. 39-43.

<sup>2</sup> Fixed investment expenses are a major item of cost to the railways. A rough estimate would put about two-thirds of the railways' normal investment in fixed property and one-third in locomotives and cars. About 80 per cent of railway expenses are for property and organization while 20 per cent are for running trains. Accordingly, piggyback offers an opportunity for the railways to cut back in their major cost area.

<sup>3</sup> See A. E. Jenner, manager, CPR piggyback services, in *Canadian Transportation*, August, 1959, p. 32-33.



*Figure 1*

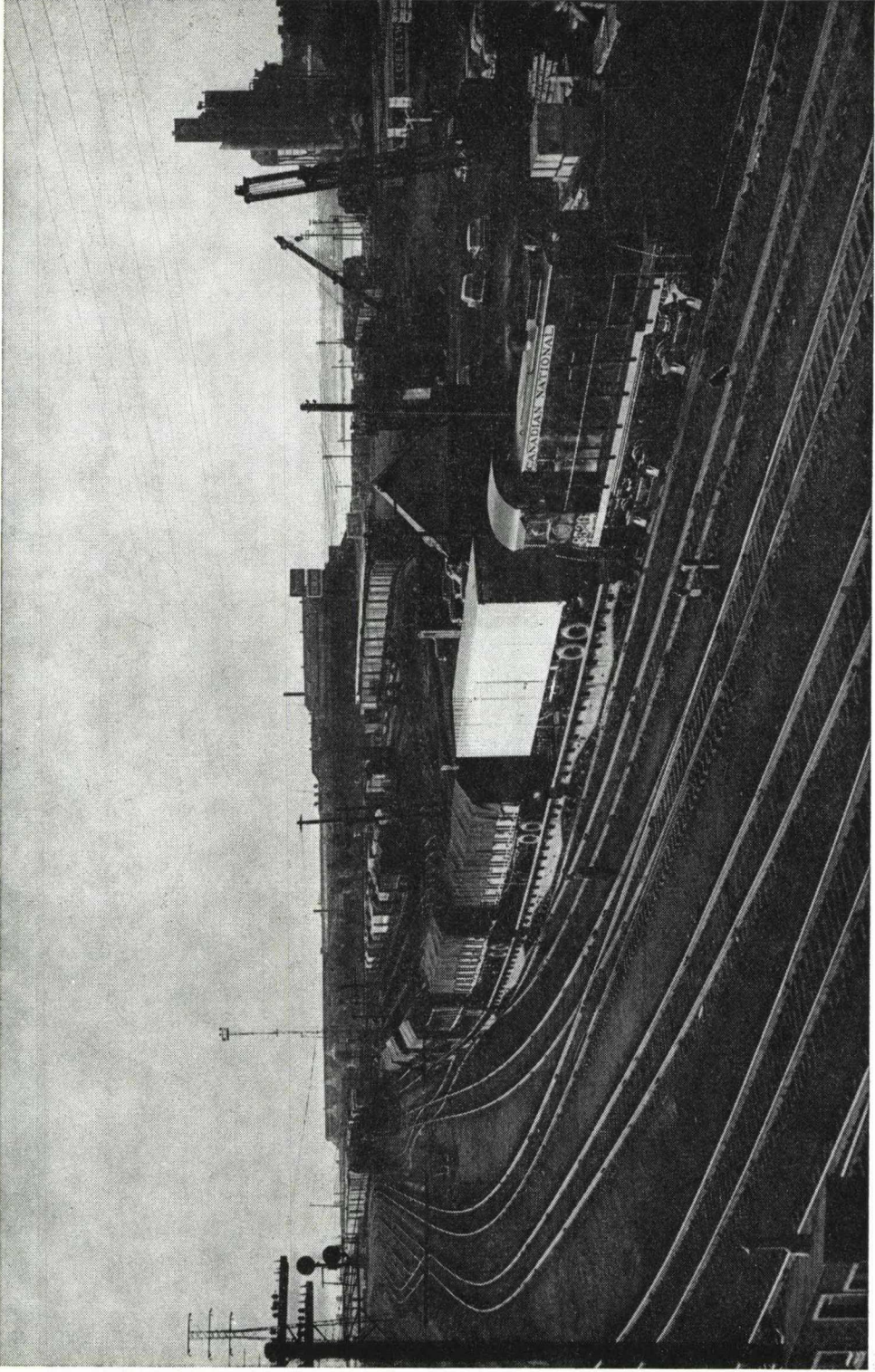


Figure 2

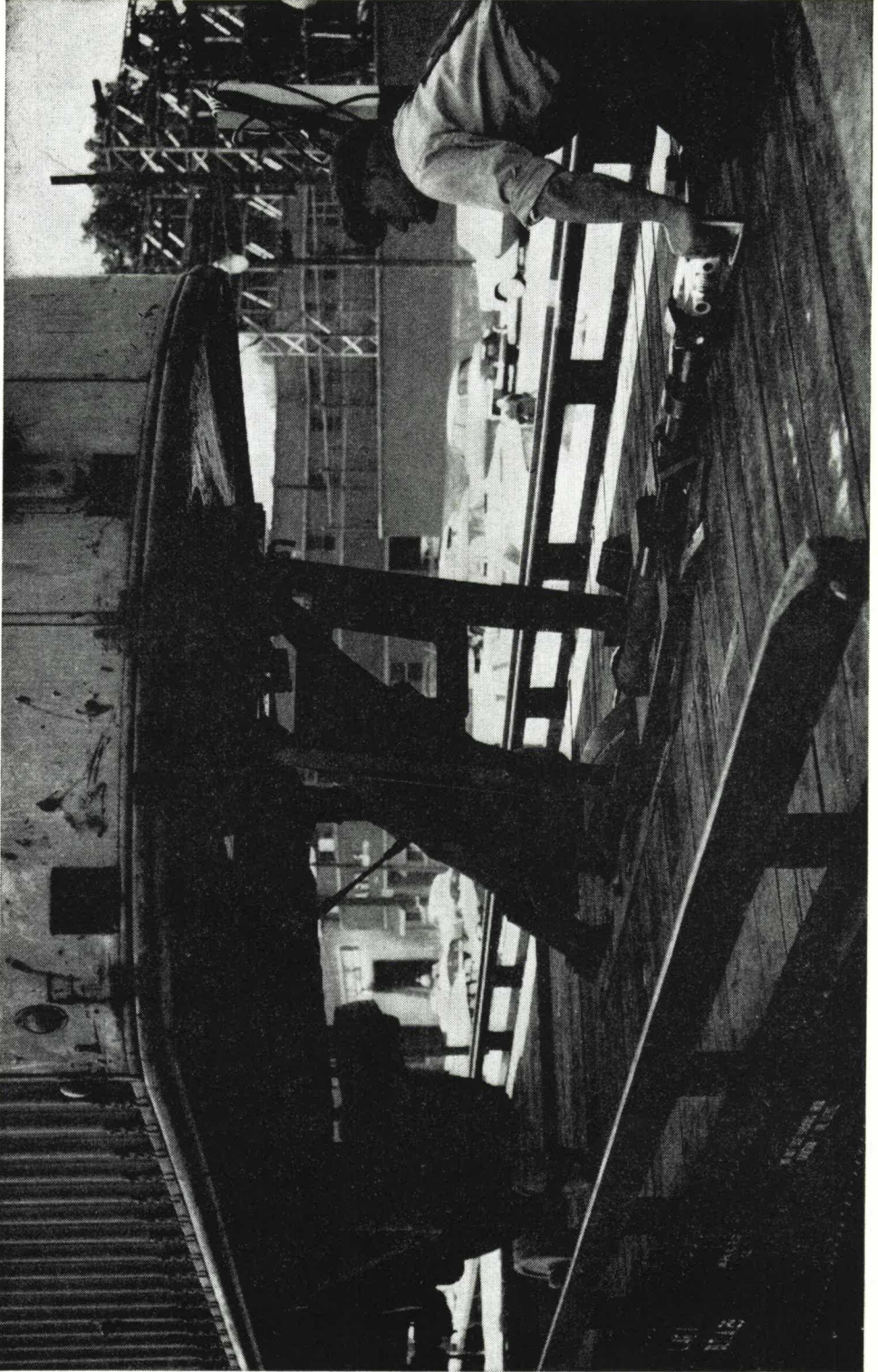


Figure 3



### *Carr: Piggyback Transportation*

end as a bridge between cars.<sup>1</sup> The CNR had 120 of their ordinary flatcars adapted in this way for the use of highway common carriers by the end of 1957. The CPR had 200.

But standard flatcars were not built or equipped for the speed and continuous operation required by piggyback service.<sup>2</sup> Accordingly as new flatcars were built in Canada they were modified especially for piggyback. Such cars were equipped with steel wheels, roller bearings, steel deck, guard rails, retractable hitch and end-loading aprons. Axle-driven generators were added on some cars to serve refrigerated trailers. By the end of 1959, the CPR had 951 flatcars in piggyback service, of which 600 were these specially built piggyback cars. The CNR had 706 flats at the year-end with about the same proportion of new cars.<sup>3</sup>

Several features of these piggyback cars in Canada are noteworthy. Virtually all of them, both CNR and CPR, are equipped with the ACF retractable hitch for anchoring the trailers. This is significant. It means that piggyback service in Canada is primarily based on the use of ordinary highway trailers rather than special containers, as in the United States. In this, Canada's railways, in making piggyback services uniform and standardized throughout Canada, have apparently profited from the U.S. experience where a diversity of equipment has been a handicap in both costs and service.

Another difference is in the capacity of flatcars. Both CNR and CPR have adopted mainly the one-trailer flat, 46 feet in length, as the most suitable. (Figures 4 and 5.) This size enables them to carry any trailer, large or small, and to give each trailer individual service. Most of the U.S. railways have adopted the 85-foot, two-trailer flatcar. In Canada, such two-trailer flats were estimated to be less than 10 per cent of the total used for piggyback.

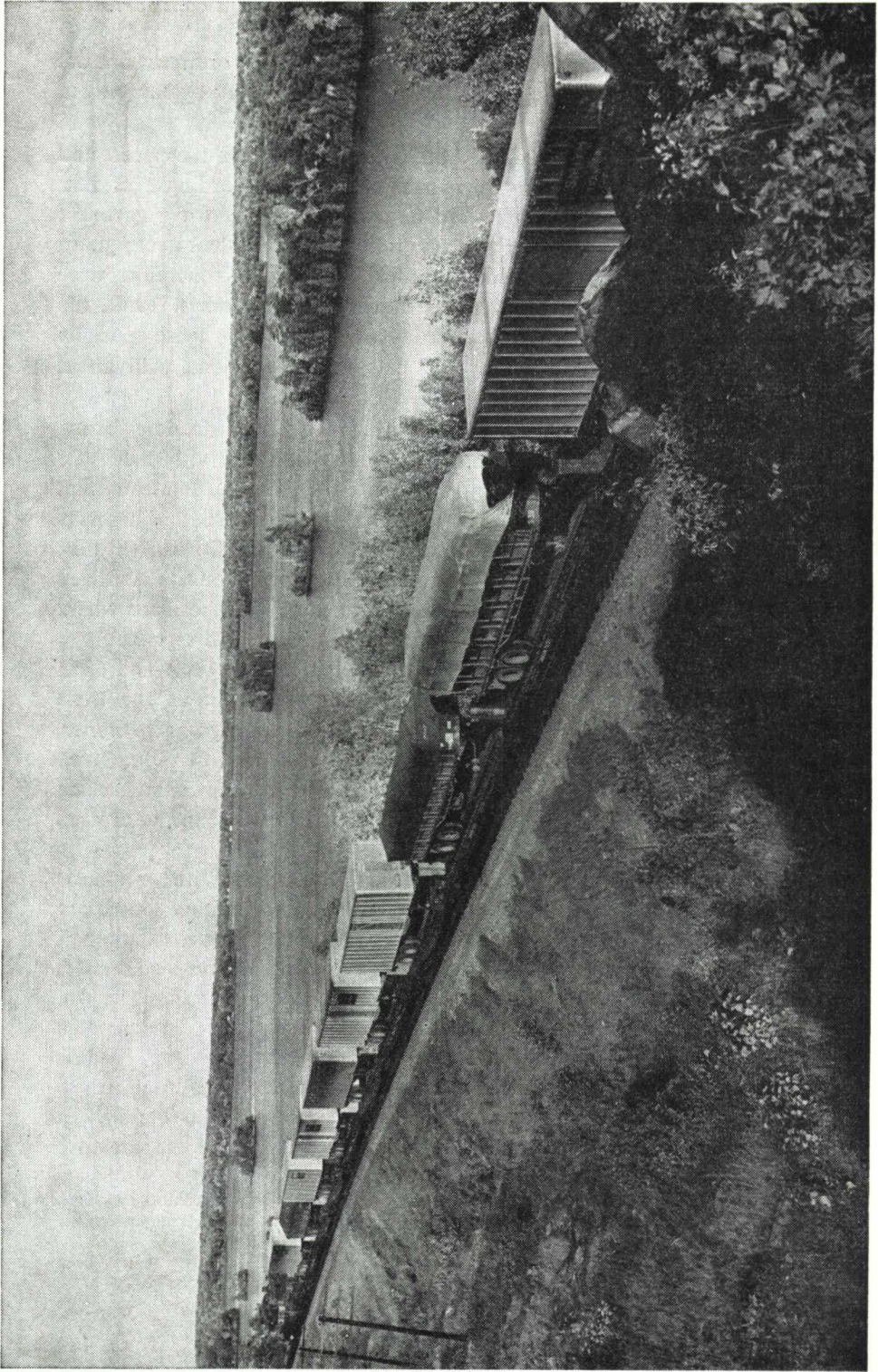
Piggyback development in Canada to date has placed little emphasis on special containers for TOFC use. Special containers, in this sense, are big boxes that can be readily shifted from one form of transport to another, i.e., chiefly between highway, rail or water services. Most of these containers are made from aluminum in various sizes from trailer dimensions down. Fork-lift trucks may be used to load and unload them. The difficulties in using only containers for piggyback is that containers, flatcars, loading facilities and highway vehicles would have to be standardized and uniform to enable the containers to be interchanged between railways and handled at any point of delivery. But the offsetting advantages of containers are also

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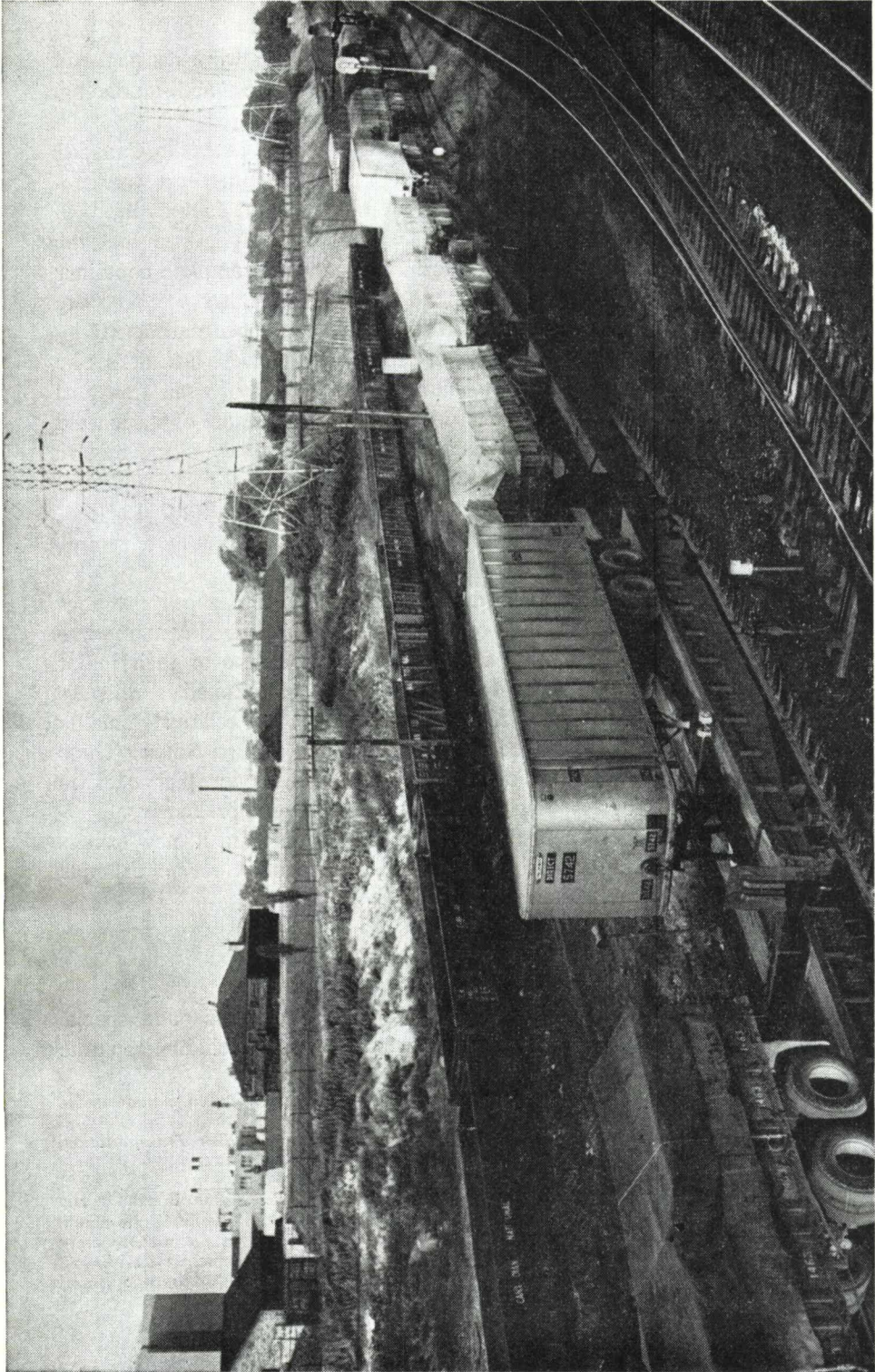
<sup>1</sup>On some of the first flats converted, the trailers were anchored with chains, jacks and chocks. The ACF retractable hitch, now being used, anchors the trailer kingpin at the appropriate height and thus eliminates the need for these other fastenings.

<sup>2</sup>The average number of miles travelled per day for a standard box car has been estimated as 35 to 40 miles against about 160 miles a day for piggyback flatcars.

<sup>3</sup>*Railway Age*, November 2, 1959, p. 36.



*Figure 4*



*Figure 5*

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substantial—less tare may give more revenue per ton, less wind resistance in rail movements, and sometimes easier and faster loading and unloading, are some of these advantages.

Special containers are now being used to a limited extent in Canada<sup>1</sup> and their advantages are recognized by the railways.<sup>2</sup> But they were not looked upon as the ultimate objective in truck-rail transport such as the U.S. piggyback development might suggest. The CPR has emphasized that the use of highway trailers is not just an interim step toward complete container techniques but may well be a permanent method.<sup>3</sup> In other words, there are likely to be substantial advantages in continuing to concentrate chiefly on highway trailers for piggyback in the future. In the main, these advantages lie in their simplicity and flexibility for shifting from highway to rail transport and *vice versa* and the lower investment in providing a minimum of specialized equipment. To use specialized piggyback containers effectively would require a whole new line of equipment and facilities and a great deal more standardization of operations, containers, flatcars and loading methods. Lack of versatility of specialized containers would also mean many more empty returns than with highway trailers.

Efficient and economical containers and flatcars for this purpose have not been readily developed. Because of this, extensive specialized containerization for piggyback may not come soon in Canada. Because of their major emphasis on the use of highway trailers for piggyback, Canada's railways have been able to expand TOFC more rapidly and with a relatively smaller additional investment than has been the case in the United States. These considerations suggest that use of specialized containers for piggyback in Canada is likely to progress slowly and may never be comprehensive.

At the same time, where the traffic appears to warrant it, new trailers with more flexibility and capacity are being developed. A recent example was the CPR's new Car-A-Van.<sup>4</sup>

## *Rates*

Since 1958, when publication of TOFC rates began in Canada, special rates have been established for various piggyback services including separate

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<sup>1</sup> For example, the CNR has been using specially insulated refrigerated containers for the transport of fresh fish by piggyback from the Maritimes to Central Canada.

<sup>2</sup> Cf. A. E. Jenner, manager, CPR piggyback services, in *Canadian Transportation*, January, 1960, p. 31.

<sup>3</sup> *Ibid.*

<sup>4</sup> This is a new auto carrier built by the Strick Company of Philadelphia. Bought in late 1959 by Smith Transport for Western piggyback service, they are built chiefly of aluminum to carry cars westward and then, with ramps and partitions moved out of the way, to carry bulk cargo on the return journey. They hold promise of providing profitable services for all concerned. These auto trailers were brought out at the same time as the new 50.5-foot box car designed to carry 4 cars. Five hundred of these were ordered by the CPR.

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rates for trailers owned by the railways, for-hire highway carriers, household goods carriers and subsidiaries of the railways.

Rates for trailers from for-hire highway carriers, Plan I, vary from 61 cents a cwt. between Montreal and Toronto to \$8.85 from Montreal to Vancouver.<sup>1</sup> The tariff is assessed on the actual weight of the contents without the trailer but the minimum loaded weight assessed is 34,000 pounds. Empty trailer rates on the two above routes are 35 cents and \$3.60 respectively, with a 20,000 pound minimum.<sup>2</sup> The railways do not provide protective services against heat or cold for the trailer cargoes and if refrigeration is provided by the shipper it must be of an approved type.

Piggyback services under this tariff (38D) are not open to all truckers. Only those for-hire truckers who have the necessary licences, from the provinces concerned, to serve the particular highway route between cities covered by the piggyback service, can qualify to use this rail service. In addition, a trucker must have made a prior contract with the railway company before he can ship trailers by rail. With a very few exceptions this tariff is "open", i.e., it covers any two points having piggyback service.

Rates for household goods in semi-trailers (also Plan I) are under a separate tariff (CFA Freight Tariff 37A). Charges in this case are, for example, 44 cents a cwt. from Montreal to Toronto and \$3.85 from Montreal to Vancouver. The minimum weight is 20,000 pounds and empty trailers take the same rate as full. These rates, substantially below for-hire rates, are reported to be particularly attractive to movers. This tariff also is open, providing service between any two points having piggyback service.

The railways have established rates for hauling their own trailers (Plan II) including the service of picking up from the shipper and delivering to the consignee. CNR Tariff CM No. 195 is one of these. It is set up to provide graduated scales of rates (according to tonnage) between specific points. Because they are primarily competitive rates, these rates are quite selective and restricting in application.<sup>3</sup> For instance, rates are quoted between Windsor and Toronto and between Toronto and Halifax but there is no provision for a through rate between Windsor and Halifax. Another feature of this tariff is that the CNR's five ramp locations in the Maritimes serve as railheads for distribution of Plan II piggyback traffic via highway to numerous small points within a radius of 50 miles.<sup>4</sup> To illustrate the competitive nature of this CM No. 195 tariff, the rate from Montreal to Toronto including one pick-up and one delivery is 67 cents a cwt. (shipments 15,000 pounds or

<sup>1</sup> Canadian Freight Association, Freight Tariff No. 38D. It became effective from January 4 and February 4, 1960.

<sup>2</sup> One trucking firm was reported to be knocking down his trailers for empty return, loading two or three knocked-down trailers on another one for return shipment by piggyback.

<sup>3</sup> Letter to the author, dated June 1, 1960, from Canadian National Railways, Ottawa representative.

<sup>4</sup> *Ibid.*

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over). The rate for this route for for-hire trailers requiring no pick-up or delivery is 61 cents. Allowing for the cost of pick-up and delivery, the two rates are virtually identical.

The CPR, in the case of one of its subsidiaries (Canadian Pacific Transport) has established a tariff of agreed charges (CTC(AC)474) for shipping trailers on flatcars. This tariff requires at least 70 per cent of the annual aggregate ton-mile traffic be shipped via CPR. These rates are for trailers, empty or full, of a maximum of 35,000 pounds including the trailer. From Winnipeg to Edmonton the charge is, for example, \$203. Four per cent is added for each 1,000 pounds over the 35,000 pound maximum.

Before appraising these TOFC tariffs, it should be emphasized that the service in Canada is still relatively new, is still being tested and some rates may, consequently, be tentative. Nevertheless, there have been no indications that the tariffs filed are temporary or subject to adjustment as traffic changes develop. Subject to these qualifications, it can be said that current piggyback service and rates show either definite or possible discrimination as between truckers, routes, ownership of trailers and commodities carried.

Regarding for-hire tariffs, it will be clear that in piggyback the railways are not providing a common (or public) carrier service. Piggyback service is provided only to those for-hire truckers who have signed contracts which have been accepted by the railways. If this contract requirement persists the railways can have a powerful voice in deciding which truckers are to enjoy any benefits of Plan I piggyback in the future. So far there has been no indication that any qualified trucking firms have been barred from service.

The limitation of Tariff 38D to truckers having provincial licences covering the comparable highway route must also be considered as discriminatory if piggyback is to be a common carrier service. But so long as the provincial governments have full responsibility for licensing and regulating both intra- and extra-provincial trucking, such a provision may be necessary to avoid conflicts.

Discrimination also appears to be evident among the rates established for the various routes. For example, the for-hire rate between Montreal and Toronto (61 cents a cwt.) is just under 3.6 cents per ton-mile (based on 34,000 pounds minimum weight). The rate between Montreal and Winnipeg (\$4.46 a cwt.) is 6.6 cents a ton-mile. The rate for Montreal to Ottawa (\$1.09) is over 18 cents a ton-mile. The Montreal-Ottawa rate may be expected to be above the Montreal-Toronto rate because it is a shorter haul and loading and unloading costs are relatively higher. But the Montreal-Winnipeg rate seems high relative to that for Montreal-Toronto since the

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former is a much longer haul and loading costs are relatively less significant.<sup>1</sup> On the other hand, the volume of Montreal-Toronto TOFC traffic is much greater and this may reduce both loading and hauling costs by permitting more full trainload movements than on the Montreal-Winnipeg run.

But all of Tariff 38D rates are high relative to those in 37A (household goods). From Montreal the regular for-hire trailer rate to Toronto is 61 cents a cwt. against 44 cents for household goods; to Winnipeg, \$4.46 against \$1.89; and to Vancouver, \$8.85 against \$3.85. It is not surprising that household goods have shifted in large volume from the highway to piggyback.

Comparison of for-hire rates (38D) with agreed charge rates between Winnipeg and Edmonton shows the cost to for-hire truckers for a loaded trailer to be about \$465 against \$203 for the Canadian Pacific Transport under its agreed charge contract.

In summary, it seems apparent that considerable discrimination in rates and routes has been established; that relatively low rates have been established on routes where such low rates would attract a large volume of traffic (e.g., for-hire trailers between Montreal and Toronto, and household goods across Canada).<sup>2</sup> Evidence indicates that the railways have been successful in attracting traffic where the TOFC rates have been kept low.

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<sup>1</sup>This tariff (38D) is considered to be a competitive tariff so neither the "bridge" nor the special subsidy goes to reduce it. Trailer rates between Montreal and Halifax under this tariff are for railways only, so a similar comparison could not be made in that case.

<sup>2</sup>Other measures, in addition to low rates, are used to stimulate Plan I traffic. H. B. Parr, assistant freight traffic manager, CNR, states that "We've found that competition of reduced boxcar rates, coupled with Plan II piggyback, has given truckers extra incentive to use Plan I service". *Railway Age*, January 4, 1958, p. 16.

## Contrasts in Canada—U.S. Development

### *Diversity in U.S. Techniques*

In contrast with the uniform development of TOFC in Canada, United States piggyback has been remarkable for its great diversity of equipment and the large investments by various railroads in facilities that are specialized to the individual interests of particular railroads. A major obstacle to the growth of piggyback in that country now is the lack of standard equipment. Much of the equipment is so specialized that it prevents one railroad's use of another's facilities.<sup>1</sup>

This diversity starts with the approximately 9,000 flatcars used in piggyback in the United States. Only about half of them are equipped with the standard ACF hitch used in Canada. The rest require special hitches or rollers for loading (e.g., Clejan Car) or special trailer-containers. This means that piggyback services are not widely interchangeable among railways. Inter-line services are severely limited because connecting railways find it impractical to make the necessary transfers.

This diversity in flatcars in the United States has been paralleled by a diversity in trailer and container equipment. The New York Central, the Milwaukee Road and other railroads have invested heavily in Flexi-Van, a container that can be rolled by hand from its highway undercarriage onto the flatcar. The Chicago, Rock Island and Pacific has emphasized its Convert-A-Frate, involving various types of demountable bodies.<sup>2</sup> Pullman Trailmobile have a special flatcar and wheels-off van container called "PAT". Specially equipped trailers are required for use with the Clejan Car, a simplified but sturdy flatcar now in use and widely promoted in the United States. There are indications that the numbers of such specialized equipment will become greater in the United States as improved equipment comes on the market and each railroad vies to obtain the most efficient and profitable for its particular purposes.

This lack of standardization is an increasingly serious problem for piggyback in the United States according to the Interstate Commerce Commission.<sup>3</sup> Since it limits transfers of piggyback traffic from one railway to

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<sup>1</sup> Cf. *Piggyback and the Future of Railroad Transportation*, by John G. Shott, Washington, 1960, p. 33.

<sup>2</sup> *Ibid.*, p. 28.

<sup>3</sup> *U.S. News and World Report*, February 1, 1960, p. 100-102.



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another it presents a serious obstacle to the future growth of TOFC.<sup>1</sup> It is because of this that so much attention has been given to containers and standardization in recent months in the United States.

A major development to meet this problem of diversity in equipment has been the organization of co-operatives for pooling piggyback cars. The largest of these is the Trailer Train Company of Haverford, Pa., which had a pool of over 3,000 TOFC flatcars available for interchangeable use by 18 railroads and one freight forwarder.<sup>2</sup> This technique has apparently given the participants many advantages over other railroads.

### *Differing Influences in Canada*

Canada's railways have not been faced with this problem of diversity of piggyback equipment. As noted above, their policy has been to avoid it by emphasizing uniformity and interchangeability and concentrating on the use of standard highway trailers.

It has been possible to do this in Canada because of certain unique advantages enjoyed by the railways in this country. First, with only two major railways engaged in piggyback in Canada, against 50 in the United States, co-operation in developing uniform and interchangeable piggyback techniques has been easier.<sup>3</sup> Second, with relatively fewer transcontinental and other truck highways in Canada more of the long-haul traffic has had to go by rail. Piggyback can thus compete more effectively with trucks for this traffic than it can in the United States. As a result more deliberate consideration could thus be given to developing techniques in Canada. Third, there has been much closer co-operation between the railways and independent truckers in Canada. This has provided Canada's railways with a supply of highway trailers for piggyback that has not been available in the United States. And finally, with both major railways providing a transcontinental service, long-haul piggyback could be established with fewer interchanges of equipment

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<sup>1</sup> An official of Montgomery-Ward states that "the heterogeneousness of (U.S.) piggyback equipment prevents shippers like us from making through-movements over multiple lines". See *Dun's Review and Modern Industry*, June, 1959, p. 82.

<sup>2</sup> *U.S. News and World Report*, February 1, 1960, p. 100-102. A co-operative shipping association in California provides trailers and flatcars and has estimated savings of 15 to 35 per cent under regular freight charges. See *Railway Age*, February 23, 1959, p. 9.

<sup>3</sup> A start was made in 1960 on a co-operative attack on this problem in the United States with the appointment by the American Association of Railroads of a special task force to develop a uniform code of interchange rules for piggyback service. Another group is working on standardizing TOFC charges. Yet these will not reach far into the major problem, i.e., *equipment uniformity*.

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between railways than was possible in the United States. These continuous hauls save time, eliminate much of the interchange problem and reduce frictions between competing companies.

Because of these differences in the environment of development it is to be expected that piggyback should take a somewhat different course in Canada even though Canadian development followed, in time, the development across the border. These differences are found in many fields: containers, forwarders, equipment leasing, mergers, use of plans, rail-truck co-operation, rates and labour.

### *Containers*

In Canada, containers have not been given the important role in piggyback that has been accorded them in the United States.<sup>1</sup> This greater emphasis in the United States on containers for piggyback may be attributed in part to the greater diversity of U.S. equipment which has encouraged the promotion of uniform containers as a means of standardizing equipment. Containerization is expected to break through this barrier of multiplicity of equipment and permit United States shippers to obtain through rates over multiple lines. But containers, to be sufficiently versatile for this purpose, would require construction of special boxes in addition to the trailer needed to transport them to the rail terminals. These special boxes mean not only extra investment costs but also extra handling costs at the terminal relative to highway trailers.<sup>2</sup>

These extra costs might well be recouped in the United States if such containers overcome the interchangeability problem. In Canada, where TOFC equipment is already interchangeable, these special uniform containers are likely to continue to play a much smaller role. Containers in Canada appear likely to be confined to a few specialized uses. Piggyback has been termed the "first big application of containerization"<sup>3</sup> in the United States but in Canada, where piggyback service depends mainly on highway trailers, and these trailers provide the uniformity required for interchangeability, containerization is unlikely to move much beyond this except for special uses—such as overseas shipments.

<sup>1</sup> Professor Geo. F. Baker of Harvard University states, "If containers enable interchange this will permit any shipment anywhere on a single bill of lading, using any and every mode of transportation to its best advantage", *Dun's Review and Modern Industry*, June, 1959, p. 88. In Canada, where carriers are fewer and provide coast-to-coast service, shippers have in the main always enjoyed this kind of service.

<sup>2</sup> Terminal facilities for side-loading flatcars with containers are more costly than end-loading trailer ramps.

<sup>3</sup> *Fleet Owner*, July, 1959, p. 64. Many reasons are given in support of containers-on-flatcars in place of the present trailers-on-flatcars in the U.S. but a "greatly expanded interchange" between highway and rail service is predominantly emphasized. But another researcher states, "It is probably too early to speculate that containers will displace the conventional semi-trailer now used predominantly in piggyback operations". See *Piggyback and the Future of Railroad Transportation*, Washington, 1960, p. 27-28.

### *Forwarding*

A second difference between Canadian and United States development is in freight forwarding. Freight forwarders are agents who organize the transportation from shipper to consignee, negotiating with the various carriers concerned for the most suitable service and rates. In the United States the lack of co-operation or standardization among railroads and between railroads, truckers, water carriers, etc., has led to a fairly extensive growth of freight forwarding services. Piggyback, with its requirements for interchangeability, has undoubtedly contributed to the growth of this service. Eventually, piggybacking may bring into being companies which will do an over-all transportation job, utilizing all types of carriers and equipment to fulfil the needs of their customers, according to Mr. H. W. Von Miller, head of the Erie Railroad.<sup>1</sup>

There is little evidence of such a need in Canada. Railways and trucking companies are better co-ordinated to provide a complete shipper-to-consignee service than in the United States. In consequence, piggyback in Canada has not been accompanied by a parallel growth in freight forwarding.

### *Leasing*

A third difference is in the leasing of piggyback equipment. In Canada, very little equipment is leased. The railways own the flatcars used and they and the truckers own the trailers they carry on piggyback. In the United States, leasing of flatcars and trailers<sup>2</sup> has begun to play a major role in piggyback services, no doubt as a means of standardization. Several companies lease equipment to private shippers and to railroads.<sup>3</sup> Some of these are freight forwarders.<sup>4</sup> Closely related to this direct leasing are the pooling operations of Trailer Train Company, noted above. Thus leasing and pooling of equipment is being used in the United States to overcome the tendency toward diversity and to promote a degree of standardization. Such special measures have not been required in Canada.

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<sup>1</sup> *Barron's*, August 4, 1958, p. 17. An example of this trend may be the United States Freight Company which is reported doing a \$175 million business in freight forwarding. Morris Forgash, president, predicts that most railroad cars will be supplanted by trailers on flats within 10 years. See *Dun's Review and Modern Industry*, June, 1959, p. 63.

<sup>2</sup> Reading Railroad leases 80 per cent of its 250 highway vehicles. *Railway Age*, February 22, 1960.

<sup>3</sup> GATX, the third largest railroad car manufacturer, has a fleet of 65,000 cars (this includes box as well as piggyback cars) and handles 50 per cent of United States leased freight rolling stock. *Business Week*, November 8, 1958, p. 54-56.

<sup>4</sup> U.S. Freight and Republic Carloading are freight forwarders who lease flatcars for use in Plan III piggyback.

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### *Mergers*

A fourth difference is seen in the increasing recognition in the United States by railroads and by the ICC and others, of the need for and the advantages of mergers of railroads. Piggyback has been a major factor in demonstrating the advantages of joining railroads together to provide fast, through point-to-point service. The setbacks to promising piggyback imposed by the difficulties of transferring from one carrier to another, often several times, have demonstrated possibilities for reducing costs and improving service by combining the operations of the railroads concerned.

### *Plans*

The differing environment of development has had a significant influence on the kinds of plans used in the two countries. In Canada, piggyback has been confined to Plan I (railways carrying for-hire trailers) and Plan II (carrying railway-owned trailers).

In Canada, three-quarters of the TOFC traffic is under Plan I. In the United States, major support has been given by the railroads to Plan II and Plan III (carrying trailers owned or leased by shippers) while Plan I traffic has not been widely encouraged. Of the 50 out of 114 Class I railroads in the United States providing some piggyback service in 1959, only 22 gave Plan I service while at least 44 gave Plan II service. At least 23 United States railroads provided Plan III service. Plan IV (shipper furnishes trailer-loaded flatcar) was offered by 18 railroads.<sup>1</sup> Several United States railroads use Plan V involving joint rates and services with trucking firms.<sup>2</sup> Some have used Plan VI, providing L.C.L. service.

This extensive use of diverse arrangements for piggyback transport in the United States appears to be due to efforts of individual railways to exploit as fully as possible every traffic potential within its own reach. These efforts have apparently operated against the promotion of interline traffic and standardization of equipment or services. The increasing growth of Plans III and IV in recent years indicates an increasing dependence by United States railroads on flatcars and trailers provided by shippers, forwarders or equipment leasing companies. The rapid growth of freight forwarding and equipment leasing indicates that the railroads may be losing control of the co-ordination of piggyback. There is evidence that this development may be the first major step toward an extensive merging of United

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<sup>1</sup> *Dun's Review and Modern Industry*, June, 1959, p. 64.

<sup>2</sup> Rock Island Railroad and Consolidated Freightways publish joint rates in 12 states for truck-rail service.

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States railroads' operations that will enable them to provide a more standardized service and avoid the costly and difficult transfers now required in through service and which are such a handicap to improvement.

In contrast the railways in Canada have had little difficulty in providing effective co-ordination of through piggyback service coast-to-coast. In addition, by confining their service to Plans I and II, with some Plan III possible in the future, they have kept the control of both the equipment and the services in their own hands. Under Plan I, Canada's railways have developed a large and profitable traffic while providing a useful service to for-hire truckers. United States railroads have been able to exploit this profitable Plan I traffic only to a limited degree.

### *Rail-Truck Combination*

Another condition which may be preventing United States railroads from utilizing piggyback potential to the fullest possible extent is the result of the decisions by the United States courts prohibiting the purchase or development of trucking lines by railroads unless such lines are used only to supplement their rail service.<sup>1</sup> In contrast Canadian railways have expanded extensively in the ownership of truck lines.

This means that United States railroads may be handicapped in developing traffic for both Plans I and II relative to Canadian railways. In Canada, piggyback and trucking have tended to complement each other whether the trucks are rail-owned or independently-owned. Canadian railways are also permitted to own trucking subsidiaries which may operate as independent common carriers as far as piggyback is concerned.

In the United States piggyback is facing increasing competition from independent highway trucking services. Because the United States railroads have not solved the problems of interchanging and interlining, they have not been able to use fully their strongest competitive weapon, i.e., low line-haul costs on long through hauls. Their competitive advantage is thereby reduced. This strikes piggyback service particularly hard. It is undoubtedly a major factor in its slower growth in the United States than in Canada.

### *Rates*

This United States competition is probably most clearly evident in the contests before the Interstate Commerce Commission over rates. Applications

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<sup>1</sup> A recent U.S. Supreme Court decision, for example, rejected an ICC order authorizing Pacific Motor Trucking Company, a subsidiary of Southern Pacific Railroad, to haul automobiles as a contract carrier for General Motors Corporation, stating that only common carrier service supplementary to railroad service could be performed by such a trucking subsidiary.

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of the railroads to lower their Plan III and IV rates are opposed successfully by trucking companies who argue that it would constitute unfair competition. This has been reported as a major handicap in the growth of piggyback in the United States. Railways have also complained that Plan II tariffs are too high, being identical with those used by common carrier truckers.<sup>1</sup>

The ICC has jurisdiction over both rail and truck rates and in the past it has appeared to agree with the truckers' contention that lower piggyback rates would constitute unfair and destructive competition to the truckers.<sup>2</sup> But the 1958 amendments to the ICC Act appear to have led to some modification of this position, to the extent that freight forwarders have been allowed to reduce certain rates. In September, 1959, the ICC approved a schedule of lower rates published by freight forwarders but it had earlier suspended a schedule of reduced piggyback rates, published by the railroads, which constituted the foundation for the lower forwarder rates. Truckers had protested against both rate reductions but only the rail schedule was suspended.<sup>3</sup>

Perhaps it is because of these rate conflicts with the truckers that the railroads in the United States view Plan I piggyback as being somewhat adverse to their interests and see most of the potential in piggybacking trailers for forwarders and others under Plans III and IV with some lesser opportunities in Plan II.

In Canada, rates for Plans III and IV have not yet been established but, for the purpose of making a comparison with United States rates, Canadian for-hire rates (Plan I) may be used. The services provided by Plan I in Canada are the same as for Plans III and IV in the United States, that is, point-to-point carriage with no pick-up or delivery.

United States rates (Plans III and IV) are usually based on a flat charge, ordinarily on a trailer-mile or car-mile basis. The United States Plan III (shipper provides trailers) charge is ordinarily 25 cents a trailer-mile for a two-trailer flatcar, or 50 cents a car-mile. Plan IV rate, with shipper providing both trailer and flat, is 40 cents a car-mile.<sup>4</sup>

Comparison of these rates with the for-hire rate between Montreal and Toronto (61 cents a cwt.), which may be considered in Canada as being reasonably low<sup>5</sup> (and is low relative to most other Canadian rates), indicates that, if the United States rates are high (as U.S. railroads claim),

<sup>1</sup> *Business Week*, February 16, 1957, p. 114-116.

<sup>2</sup> *Piggyback and the Future of Railroad Transportation*, by John G. Shott, Washington, 1960, p. 13 and following.

<sup>3</sup> *Ibid.* A Plan III proposal of the Burlington Railroad has been condemned by the ICC for its "unduly low" rates and constituting a "destructive competitive practice". *Railway Age*, March 16, 1959, p. 28.

<sup>4</sup> *Dun's Review and Modern Industry*, June, 1959, p. 74, and *Railway Age*, November 30, 1959, p. 55.

<sup>5</sup> J. R. MacLeod interview.

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then Canadian rates must be quite high also. The Montreal-Toronto rate based on a minimum trailerload (7½ tons) would be about 27 cents a trailer-mile. On a 10-ton load it would be 36 cents a trailer-mile. Against the United States rate of 25 cents, which is claimed by the railroads there to be higher than costs warrant,<sup>1</sup> Canadian rates would appear relatively high.

This may indicate that TOFC operating costs are higher in Canada than in the United States or that a wider margin of profit is being taken in Canada. In either case, it suggests that trucking services by highway can compete in rates more easily in Canada than in the United States.

### *Labour*

A preliminary comparison of union arrangements with respect to piggyback indicates that for-hire truckers in Canada may have some advantages relative to those in the United States in making use of piggyback services. United States labour contracts were reported to require that all union drivers in the employ of the company must be engaged before piggyback services could be utilized.

In Canada, a recent Ontario arbitration board decision indicated that the drivers' union contract placed no limitation on the use of piggyback. On the whole, however, there appears to be little opposition to piggyback from labour unions. This may be because, with the continued growth of trucking, driver employment has been holding steady or expanding.

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<sup>1</sup> In support of their action to have such rates reduced "the railroads have submitted extensive cost studies and analyses and other supporting data". *Piggyback and the Future of Railroad Transportation*, by John G. Shott, Washington, 1960, p. 15.

## Competition with Conventional Rail Operations

### *General Services*

The major advantages in services provided by piggyback relative to conventional railway freight services are in reducing handling operations, increasing speed of delivery, providing certain specialized services and reducing losses and damage. Trailers can be loaded at the factory, sealed and taken directly to the piggyback terminal where within an hour or two<sup>1</sup> they may be loaded on flats, switched into trainloads and under way on the main line. This does not get trailers started on the way quite as fast as direct highway transport would, but it can be a very great improvement over standard box car services.

TOFC service reduces handling and time of delivery by circumventing freight sheds, team tracks and sidings. Team track operations usually require two additional handlings, one each at origin and destination, that direct piggyback service can avoid. In the case of operations through freight sheds with less-than-carload shipments large enough for a full piggyback trailerload, four such handlings can be eliminated.<sup>2</sup> Labour is the most important factor in these handlings of freight and at current wage levels the savings by piggyback can be very great. Of course, some less-than-trailerload shipments must still be handled through freight terminals whether they go by piggyback or box car. But TOFC loads being smaller, much more of the freight can be handled directly by piggyback. The CPR has reported a sharp increase, beginning in 1959, in the numbers of its cartage and express trailers being shipped by piggyback.<sup>3</sup>

TOFC service can also speed delivery by eliminating most of the yard classifications including those at origin and destination. Delivery time is also reduced by eliminating much of the switching, including dropping off cars at intervening points. The total time saved by piggyback relative to box car service is commonly very great in these operations. Classification can usually be carried out while the trailers are being loaded at the ramp and point-to-point shipment of trailers makes classification en route or at destination unnecessary. Switching en route, when necessary, can be simplified by

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<sup>1</sup> About three to six minutes to load or unload each trailer is reported to be required. About 30 minutes is estimated to be the time required to make up a 60-car train of trailers. The rest of the time would be required to move the trailer train from the ramps to the main line. The time for this depends on location of the terminal and other conditions.

<sup>2</sup> Cf. *Economics of Competition in the Transportation Industries*, by John R. Meyer, et al., Cambridge, 1959, p. 103-104. This reference will be called Meyer, et al., henceforth.

<sup>3</sup> A. E. Jenner, in *Canadian Transportation*, August, 1959, p. 34. These may be increased still further as the co-ordination of L.C.L. express and railway truck traffic, now being organized in Vancouver and Vancouver Island, is extended. See N. R. Crump in *Western Business and Industry*, August, 1959, p. 33.



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having special road-switcher locomotives drop the cars at trailer ramps located outside major cities. But highway truck hauls may be more desirable than such switching operations except where the volume is large.

For convention box car movements classifying, switching and line haul consume the most time, aside from the extra time taken for loading and unloading at origin and destination. A United States study<sup>1</sup> estimates that 10 per cent of the line-haul time (this would be roughly about 2.3 hours for the average rail haul of 431 miles<sup>2</sup> in Canada) is spent on sidings en route. An average of eight hours is required for switching at terminals, the average distance between terminals being 140 miles. In Canada, with an average freight haul of 431 miles by rail, such switching would average over 24 hours per haul. In addition, the United States study estimated an average of 48 hours was lost in movements of rail freight at origin and destination.<sup>3</sup>

On this basis, something over 74 hours, aside from running time, would be taken on the average to deliver freight in Canada by the standard box car method.<sup>4</sup> United States railways would be higher than this, since extra time for interchanges is not included in the 74 hours.

By piggyback, much of this average loss of 74 or more hours can be eliminated and, in addition, the line-haul time is usually reduced by using faster trains than the standard freights.<sup>5</sup> Because of these time reductions, piggyback has been able to give a very great improvement in speed of delivery over conventional rail service. It can approach close to truck services in this speed of delivery except for the short hauls.

Piggyback can also give overnight service, like trucks, on traffic that box car services would require three or four days to deliver under normal conditions. Overnight TOFC service is important if railways are to compete with trucks.<sup>6</sup> But suitable schedules for such overnight service must also be

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<sup>1</sup> Meyer, *et al.*, p. 192-193. Some of the findings of this study were based on the experience of the CPR but most of the data were from U.S. railroads.

<sup>2</sup> Average haul per ton, 1958 *Waybill Analysis*.

<sup>3</sup> This U.S. study also allowed extra time for interchanges, but these would be fewer in Canada, with only two railways.

<sup>4</sup> Another U.S. transportation specialist estimates 6 to 48 hours as the time required to switch a carload of freight through the classification yard, etc., before getting it under way on the main line. Additional stops are made along the main line to drop off and pick up cars. Then at destination the box car traffic must pass through a second classification before reaching a point where it may be delivered. Freight is sometimes in Chicago 48 hours before the consignee receives it. Thus, while the average U.S. freight haul is 429 miles, because of classification and switching, the average freight car goes only 48 miles in the average day. See *The Second Transport Revolution*, by Marvin J. Barloon, Harper's Magazine, March, 1957, p. 39.

<sup>5</sup> An average road speed for standard U.S. trains of 18.7 miles an hour was used in the U.S. study. Average speeds of piggyback trains in Canada were not available but they would probably be close to double that figure.

<sup>6</sup> President Jack Snead of Consolidated Freightways (reported to be the largest U.S. trucking firm) states that customer service demands overnight service for 92 per cent of the shipments out to 450 to 500 miles. See *Railway Age*, February 29, 1960, p. 15.

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established to meet customer requirements in this respect, i.e., delivery of trailers to the ramp up to late in the evening, the piggyback train leaving about 11 p.m. and arriving at its destination by about five to seven a.m.

This is the type of TOFC service provided between Montreal and Toronto (340 miles) and which has proven so popular with for-hire truckers. By August, 1959, the CPR was running two solid piggyback trains each way on four nights a week on this route and one each way on Friday and Saturday nights.<sup>1</sup> Similarly, a solid CPR piggyback train was going each way on five nights a week between Montreal and Ottawa and also between Montreal and Quebec.

Speed of piggyback service has been improved further by using fast freight locomotives or by including TOFC in passenger train consists. In fact, piggyback is said to have saved some passenger runs in Canada by providing the extra revenue needed to make them profitable.<sup>2</sup>

A major service advantage of piggyback over conventional box car operations in Canada is the flexibility and adaptability that has been developed from the beginning in TOFC. Special refrigerated trailers have been equipped for the service with battery-operated cooling. Some flatcars are provided with generators for recharging these batteries.<sup>3</sup> Special coast-to-coast services were provided at special rates for household goods shipped in trailers, starting in February, 1959.<sup>4</sup> This was a service that furniture movers had been seeking for many years. It is being widely used already. The CNR has, since July, 1959, provided a piggyback service for complete tractor and semi-trailer units as well as for smaller trucks (which are tied down to the flatcars) between Moncton and Halifax. Other special piggyback services have been adapted to the needs of truckers and other shippers. But in the main, TOFC should be considered as a general rather than a specialized service, considering the nature of its traffic.

Perhaps the most widely recognized service provided by piggyback is in the great reduction of losses and damage relative to conventional freight shed and team track services. Trailers can be sealed when they leave the shipper's warehouse and need not be opened until they reach the consignee. The result: a very large decrease in pilferage losses. With the number of handlings reduced and shipments riding more smoothly in the trailer on the flatcar than in the standard box car (and possibly more smoothly than on the highway), the chances for breakage or other damage are also greatly reduced.

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<sup>1</sup> *Canadian Transportation*, August, 1959, p. 34.

<sup>2</sup> *Railway Age*, May 16, 1960, p. 9. The extra cost of handling TOFC on passenger runs may be substantial, however.

<sup>3</sup> In the main, TOFC serves non-perishable traffic, however.

<sup>4</sup> See report by Donald Gordon in *Monetary Times*, Annual National Review, 1960, p. 98-102.

### *Services to Truckers*

Piggyback provides special services to certain users. For-hire truckers are given much greater flexibility in their peak load operations by TOFC service. Trailers may be loaded beyond the number of tractors or drivers available and the surplus shipped by piggyback. The importance of this facility to the larger truckers has been widely recognized. In addition, on heavily travelled highways between major industrial centres, such as between Montreal and Toronto, piggyback may provide these common carrier truckers with a faster and more economical service than their own tractors and drivers could provide. Where piggyback can schedule an overnight service it may assist trucking firms a good deal. Piggyback may provide an economical alternative in winter if snow or ice makes highway travel difficult from time to time. This is not the serious hazard it used to be, however.

Piggyback, by reducing the number of vehicles on the highways, may tend also to ease the problem of adverse public relations for trucking companies. It may be possible also that interprovincial piggyback services may be used to a greater extent in future to avoid limitations on load weights, trailer sizes, and such, which are imposed seasonally or otherwise by the various provinces.<sup>1</sup>

### *Services to Shippers*

By careful study and planning and the adaptation of truckers' techniques to TOFC service, Canada's two major railways have undoubtedly tried to provide, in piggyback operations, a service that meets the speed and service needs of shippers. In the main they have been successful. Shippers accustomed to using conventional box car services find it most satisfactory in terms of faster delivery, goods received in better condition, fewer claims and losses and savings in costs and inventory. Some shippers, accustomed to truck service say that piggyback has made CN and CP rail services competitive again in service and rates with highway transport.<sup>2</sup> While the trends in the distribution of freight traffic do not quite support this latter opinion, nevertheless piggyback has brought a vast improvement in a major area of rail freight service and in several features has advantages over highway transport.

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<sup>1</sup> It should be noted that piggyback is not likely to be used to circumvent the lack of reciprocity in licensing, however. Under present contract conditions, for-hire truckers using piggyback must have the necessary licences for the route before they are allowed to use piggyback. Piggyback in Canada may differ in this respect from the U.S. In that country, truckers are reported being drawn to piggyback by increasing ton-mile tax rates, increasing licence fees, higher fuel costs and load limits and other revenue fees that make highway transport difficult. See *Business Week*, February 16, 1957, p. 114-116. On the other hand, the limited use of piggyback by for-hire truckers in the U.S. relative to Canada does not support this statement.

<sup>2</sup> *Canadian Transportation*, August, 1959, p. 39.

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### *Services to Railways*

Before leaving the subject of services, a brief account of the services and benefits of TOFC to the railways themselves should be given. Probably the best summary of favourable views on these is found in the report of a round-table discussion organized by *Railway Age* and reported in the January 13, 1958, issue of that magazine. Traffic experts from United States and Canadian railways concluded that piggyback service:

1. Provides a way to go after high-rated traffic now moving over highways.
2. Permits high utilization of equipment.
3. Produces revenues per unit exceeding those of carload freight.
4. Reduces damage claims.
5. Puts a growth element in the traffic pattern.
6. Offers an effective means to compete for short-haul traffic.
7. Establishes highly dependable service, where shippers can obtain deliveries timed to their specific needs.
8. Sets the stage for recapture of L.C.L. businesses and make it profitable without big capital expenditures.

In brief, these say that piggyback allows the railways to circumvent many of the most costly and time-consuming operations of conventional rail freight services in order to compete in costs, speed and service with trucks. As expressed, these opinions appear somewhat more optimistic than this but they indicate also the enthusiasm of many railway traffic men for the new opportunities offered in piggyback. This enthusiasm has arisen because piggyback is the first major improvement in rail freight service that shows positive evidence of enabling the railways to compete for the most profitable traffic with trucks.<sup>1</sup>

At the same time, piggyback enables the railways to serve more conveniently those shippers whose plants are not located on rail sidings. It permits piggyback cars to be used much more fully than box cars in conventional service. One estimate puts TOFC utilization at four times that of freight cars

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<sup>1</sup> With the exception of piggyback, virtually all the railway improvements in recent years have been cost-reducing improvements. See, for example, N. R. Crump in *Western Business and Industry*, August, 1959, p. 33, where he stresses that the cost of dieselization, \$200 million to the end of 1958, saved \$40 million in transportation expense and \$9 million in maintenance expense each year for the CPR. But while the railways have been making these cost improvements, shippers have tended to seek the extra services and speedier deliveries, at higher costs, as supplied by the truckers. Piggyback comes close to meeting the service competition of trucks within the field in which it operates. Cf. M. J. Barloon, *Harper's Magazine*, March, 1957, p. 39.

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as a whole—an average of 175 miles a day for piggyback versus 47 miles for all freight cars.<sup>1</sup> Trailer Train Company in the United States, the largest TOFC agency in the United States, reports a flatcar utilization of 197.2 miles a day on 85-foot piggyback cars against 29.3 miles for all other cars.<sup>2</sup>

The lower cost for equipment and facilities required for piggyback relative to conventional service is another feature attractive to the railways. Investment and maintenance costs appear likely to be so small in comparison with those for customary freight terminals, team tracks, sidings, classification yards, etc., that the railways will have an immediate and strong incentive to divert as much box car traffic as possible to piggyback.

The costs of handling freight in TOFC service are reported to be remarkably low in comparison with conventional freight services,<sup>3</sup> though such costs may not always be accurately reflected in piggyback rates. A Pennsylvania Railroad official states that it costs his company only \$19.37 to get a loaded Plan III piggyback car into its train and ready to roll at the New Jersey terminal. But it costs \$180 to get the same amount of revenue freight loaded into box cars in Manhattan and have them switched and reswitched into a road train in New Jersey. He also reported a forwarder shipment of 46.2 tons moving in box cars from New York to Chicago, which yielded a total revenue of \$1,523.79, less terminal expenses of \$510.18, left only \$144.80 per car for line haul and Chicago terminal expenses. By Plan III, piggyback on the same route, 32 tons produced a total revenue of \$451.50, less \$37.56 for terminal expenses at both ends, leaving a balance clear for line haul of \$413.94.

These low terminal costs for piggyback have allowed Canada's railways to set moderate (e.g., Montreal to Toronto) to high rates for the service and still obtain generally higher earnings than can be gained from carload freight. The CPR reported an increase in gross revenue of \$4.5 million in 1958 from its common carrier piggyback (Plan I) services alone.<sup>4</sup>

If United States experience is an indication, the result has been that piggyback traffic has made very desirable increases in net revenues for both major Canadian railways.

United States rates though on a mileage rather than a weight basis as in Canada, were fairly close in the comparison made above to rates in Canada and the United States railroads report remarkable gains in net revenue

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<sup>1</sup> *Canadian Transportation*, August, 1959, p. 40. This estimate, made by American Car and Foundry Company, probably included U. S. railroads, for whom ACF also makes hitches, in addition to the CNR and CPR.

<sup>2</sup> *Piggyback and the Future of Railroad Transportation*, p. 41. Trailer Train recently reported its average piggyback car goes 11,442 miles in 60 days. Its record for a single car was 17,296 miles in 30 days.

<sup>3</sup> *Piggyback and the Future of Railroad Transportation*, Appendix III, p. 39. There is little public information available in Canada on piggyback costs and revenues.

<sup>4</sup> *Seventy-eighth Annual Report*, 1958, p. 43.

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from piggyback. For Plan III (shipper-owned trailers) between Chicago and points on the East Coast, the rates are 50 cents per car-mile and the revenue over out-of-pocket costs were reported to range from \$108.25 to \$198.79 per car.<sup>1</sup> Between Chicago and St. Louis this revenue margin ranged from \$132.94 to \$239.08 a car. Under Plan IV, piggyback cars between Chicago and the southwestern states gave returns over out-of-pocket costs of \$311.40 to \$379.19.<sup>2</sup> One United States railroad reported that on the average it makes, after expenses, about \$110 per trailer under Plan I, \$55 under Plan II and \$150 under Plan IV. Missouri Pacific Railroad reported its average revenue in 1958 for each container or trailerload was over \$180 against an average revenue for non-piggyback cars of about \$146.<sup>3</sup>

### *Limitations of Piggyback Services*

Yet it may not be assumed from the above analysis that the improved revenue and service features of piggyback will allow it to expand indefinitely at the expense of box car traffic.

Piggyback is clearly limited in how far it can supplant box car services. On the one hand, it is limited to the traffic areas where it has an advantage in efficiency over box car services. On the other hand, it is limited by the efficiency of highway trucking services.

Looking first at current box car traffic, piggyback at present has potential advantages in only a part of it. This area of potential TOFC advantage includes small shipments under 15-20,000 pounds (i.e., much of the railway express and L.C.L. freight) and other shipments that are high in value and require considerable manual handling (such as the manufactured and miscellaneous freight classification). TOFC service can reduce the number and costs of handling of such traffic. It can give speedier delivery and other added services. But such traffic comprises only about 25 to 30 per cent of total box car traffic.

Most of the railways' current traffic, 65 to 75 per cent, is in bulk, machine-loaded products that will continue for some time to be most efficiently handled by box or gondola car services as at present. This freight traffic which can be handled in large volume by machine loading includes iron ore and other minerals, some timber products, grains, certain chemicals and

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<sup>1</sup> *Railway Age*, November 30, 1959, p. 55 et seq. In these examples, out-of-pocket costs include a 4 per cent return on 50 per cent of the road costs and on 100 per cent of equipment costs.

<sup>2</sup> *Ibid.* The Pennsylvania Railroad reported that Plan III earnings were about 50 per cent above Plan I and substantially above Plan II earnings.

<sup>3</sup> *Railway Age*, February 16, 1959, p. 60.

others. In the case of these commodities, machine handling in trainload volumes by box or gondola car provides lower cost service than piggyback would now be able to give.<sup>1</sup>

This means that piggyback is likely to compete for about 25 per cent or less of the railways' current freight traffic.<sup>2</sup> In 1960, TOFC had assumed 4.3 per cent of total railway carloadings. It should reach considerably further into the 25 per cent than this and should thereby enable the railways' to retain more of its profitable traffic. But it may be reasonable to expect that piggyback will not reach much beyond 10 per cent of total carloadings, the rest being held by box car services or lost to trucking.

Piggyback is limited also in the range of its competition with trucking. Piggyback is excluded from competition with highway services on most short hauls because of the extra costs and time lost in loading and unloading at piggyback terminals.<sup>3</sup> Mr. A. E. Jenner, manager of CPR piggyback services, has stated that the trucking industry is more effective for hauls under 250 miles, trains for mass movements on long trips.<sup>4</sup>

Because TOFC must give trainload, terminal-to-terminal service to compete effectively in speed and service with trucking, it is, in effect, excluded from the traffic of intervening stations. Piggyback is also at a disadvantage at terminals where the volume of traffic does not permit trainload movements. Most TOFC shippers want overnight service and this is not readily operated on a profitable basis unless trainload volumes are available. The volume must also be sufficient to warrant the cost of installing the terminal facilities. Empty returns are costly, so there must be a reasonable balance of traffic both ways on each route. Nor can piggyback be allowed to downgrade the speed and service of passenger and mail trains. All of these limit the scope and flexibility of TOFC in its competition for traffic with direct trucking.

At the same time the growth of TOFC should support some expansion of trucking, not only to serve intervening stations but in other areas. Because the piggyback role is mainly in providing full-train service between major

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<sup>1</sup> In the main, these are low-rated, low-profit traffic. The tendency for the railways to retain only this traffic is somewhat further advanced in the U.S. As early as 1957, A. E. Perlman, then president of the New York Central Railroad stated that soon only these low-rated commodities would be left for box cars. See *Business Week*, February 16, 1957, p. 114. Compare also Meyer, *et al.*, "Inter-carrier competition for the carriage of high-value goods (mostly manufactures and miscellaneous) exists among rail boxcar, piggyback, package freighter and truck transportation and for bulk goods (mostly products of forests, mines and agriculture) among water, pipeline and rail transportation", p. 188.

<sup>2</sup> This 25 per cent, mostly manufactures and miscellaneous, is normally higher rated and should be more profitable for piggyback than other box car traffic.

<sup>3</sup> It has been estimated that it would cost a trucker, on the average, as much to move a trailer (whether rail- or independently-owned) from where it is loaded to the TOFC ramp and from the ramp at destination to the consignee as it would cost to deliver it direct by highway 100 miles.

<sup>4</sup> *Canadian Transportation*, January, 1960, p. 31. But it should be noted that the range of advantage for truck hauls has continued to rise as sturdier highways and technical innovations in trucking combine to permit larger payloads and resulting lower costs by highway.

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industrial centres, a growth in short- and medium-haul trucking as a feeder service may be expected. In addition, operating on a terminal-to-terminal basis, piggyback will of necessity carry some trailers beyond their destination with delays in time and distance of delivery. Direct truck service by highway could have significant advantages in this respect.

From this it may be seen that the range for effective piggyback competition is not extensive, circumscribed as it is by efficient machine-loaded box car service on the one hand and by highway transport on the other. Of the two, truck competition appears likely to prove the most difficult to meet. This is partly because trucking has substantial advantages in some respects over TOFC. But mainly it is because of the rapid rate of improvement in the costs and services of trucking. These are likely to encroach steadily on those competitive advantages that TOFC now enjoys.



## Competition with Trucking

### *General*

The growth of piggyback transportation in Canada, following the growth of trucking, has been mainly in response to new and changing demands for faster, more specialized transport services. Changes in the organization and location of the industrial economy, changes in the composition of freight traffic (a larger proportion is more highly-fabricated, more valuable, more perishable and higher rated than in the past), the increasing importance of inventory costs and new developments in transport equipment and facilities have all supported this growing shipper demand for more speed and service in Canadian transport as well as the willingness of shippers to pay higher rates for these special services.

In dealing with the services provided by piggyback, therefore, it is important to consider the competition of piggyback with highway trucking. In the ten years from 1949 to 1958, highway carriers' share of total intercity freight traffic (in ton-miles) rose from 7.2 to 11.1 per cent, an increase of 138 per cent by volume. In the same period, the railways' share of this freight traffic fell from 68.1 to 52.3 per cent although the volume increased by 18 per cent. Piggyback services were looked upon as a means of halting this decline in the relative share of the railways. But by 1960, piggyback was carrying only about 2 per cent of intercity freight traffic.

Trucking, because of its greater flexibility and adaptability to the particular needs of individual shippers, was better equipped than railway box car services to meet the new demands of the transportation economy as they arose in the past. As a result, shippers had turned to trucking, especially in the decade of the 1950's, for these specialized services. Truckers were able to take over virtually all of what is called short-haul traffic (i.e., up to 100 to 200 miles) and a large portion of the medium-haul traffic (e.g., up to 500 to 600 miles). Until the last decade or more, the railways had been able to meet the competition of trucks for traffic that required longer hauls than these. But mainly since 1950, trucks have offered increasing competition in long-haul transport also, especially for perishable products and high-value, highly-fabricated products that demand special speed and service.

Pipelines and air transport have also encroached on railway freight traffic in this recent period. A major feature of these alternative methods of transport was their ability to provide carrier service that was better adapted to the particular needs of shippers than the more generalized railway services. Lower costs have, of course, been an important factor also, particularly in short-haul trucking and in pipeline competition.

This continued decline in the railways' share of traffic illustrates the deficiencies in traditional freight shed and box car methods of handling freight

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under modern conditions that piggyback was designed to remedy. TOFC enabled the railways to gain some of the service innovations developed by truck transport and combine these with possible low line-haul costs by rail. Indications are that piggyback service can remedy some, though not all, of the important deficiencies of box car service in longer hauls. Piggyback might also give the railways some advantages over trucks in costs, for certain non-perishable traffic, particularly on large-volume movements between major industrial centres, though this is not always evident in TOFC rates.

Thus piggyback service is competing with trucking for that share of railway box car traffic that is suitable for handling in trailers, for the traffic now carried in medium and long hauls by trucks, as well as for new trailer traffic that may develop.

## *Cost Competition*

In appraising competition between piggyback and direct highway transport both costs and services are relevant considerations. Most emphasis had been placed on the cost advantages of TOFC.<sup>1</sup>

Line-haul costs for piggyback have been variously estimated at one-quarter to one-half of truck costs.<sup>2</sup> An extensive United States study,<sup>3</sup> comparing truck costs with average box car costs, gives trucking a cost advantage only for hauls under 100 miles. Presumably this would enable TOFC, with costs lower than box car service, to compete effectively with trucks on hauls under 100 miles. But as the above evidence has shown, TOFC, in the main, can compete effectively with trucks only on hauls of 200 to 250 miles or more.

The basic weakness in these cost comparisons between TOFC and trucking was that careful costing of the two modes had not been carried out. In the main, the costs used for piggyback were the average railway line-haul costs which are low because 60 to 70 per cent of rail traffic is bulk, machine-loaded commodities that move in trainload volumes on fairly long hauls direct from origin to destination. The costs of these line-haul movements are low, about one cent per ton-mile. But these are not the costs encountered by piggyback which handles small shipments requiring more manual handling and considerable pick-up and delivery (P & D) services.

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<sup>1</sup> Reports in popular journals, apparently based only on opinion, indicate that piggyback can save for-hire truckers up to 40 per cent of their costs. See, for example, *Financial Post*, September 5, 1959, p. 21, and *Dun's Review and Modern Industry*, June, 1959, p. 74.

<sup>2</sup> See J. C. Lessard, *Transportation in Canada*, Ottawa, 1956, p. 81, where rail costs are estimated at 1.5 cents per ton-mile against truck costs of 5 to 6 cents a ton-mile. See also *Harper's Magazine*, March, 1957, p. 39, *Financial Post*, September 5, 1959, p. 21, and *Dun's Review and Modern Industry*, June, 1959, p. 63. In the latter, Professor Baker of Harvard University puts piggyback long-haul ton-mile costs at about half those of trucks.

<sup>3</sup> Meyer, *et al.*, p. 189 and following.

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Complete costs of piggyback operations were not obtained in this study. But TOFC rates (which range from 3.6 cents, Montreal-Toronto, to 18 cents, Montreal-Ottawa, per ton-mile) indicate that costs would be substantially above these low line-haul railway rates for box car traffic. Box car costs appear low because most of this traffic is very heavy per unit of space, (ores, grain, lumber, etc.) the hauls are long and costs of pick-up and delivery (largely mechanized) are relatively small. Piggyback traffic is not normally as heavy per unit of space, hauls were mostly under 400 miles, and P & D costs including terminal loading and unloading are relatively high—probably half to two-thirds of the average all-inclusive costs per mile.

It may also be noted that these TOFC costs, clearly higher than costs for volume movements by box car, can only be attained by regular piggyback trainload movements from terminal-to-terminal. If less than trainload movements occur, or if stops for switching at intervening stations are made, etc., these TOFC costs rise considerably.

Turning to truck costs, it seems apparent that estimates of truck costs used for comparisons with TOFC have in many cases included both line-haul and P & D costs. Thus the Lessard study showed average costs for trucks in 1956 as 5 to 6 cents per ton-mile against rail line-haul costs of 1.5 cents a ton-mile.<sup>1</sup> The weakness of these data as a basis for line-haul costs by truck are illustrated in a special study of truck costs made in 1960-61.<sup>2</sup> This shows that, for short-medium truck hauls, line-haul costs averaged only 3.53 cents a ton-mile, while their P & D costs were 3.59 cents a ton-mile.<sup>3</sup> In other words, when P & D costs are eliminated to make truck costs comparable with TOFC,<sup>4</sup> line-haul costs are only about half as high as those commonly used in estimates of trucking costs.

These line-haul costs are significantly lower than TOFC rates (the lowest TOFC rate is 3.6 cents a ton-mile, Montreal-Toronto). The cost of loading and unloading at terminals would be an additional cost for piggyback. In these circumstances it seems apparent that these TOFC rates would need to be very much higher than piggyback costs to give a cost advantage to piggyback over trucking.<sup>5</sup> Rates by direct highway were commonly equivalent to those by TOFC (both for Plan I & II).

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<sup>1</sup> United States references noted above appear to use the same basis of comparison.

<sup>2</sup> See *Truck-Rail Competition in Canada*, in this volume, in particular the Section on Truck Costs.

<sup>3</sup> In long-haul trucking, line-haul costs averaged 2.94 cents a ton-mile and P & D averaged 0.31 cents.

<sup>4</sup> P & D costs by piggyback, including loading and unloading trailers at TOFC terminals, would ordinarily be somewhat higher than P & D costs by highway.

<sup>5</sup> Where the TOFC volume is low, e.g., less than regular trainload movements terminal-to-terminal, piggyback costs may be substantially higher than with trainload volumes. This may, in part, account for the high rates, for example, between Montreal and Winnipeg (6.6 cents per ton-mile) and between Montreal and Ottawa (18 cents per ton-mile).

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It seems likely that if piggyback had significant cost advantages over highway service, the railways would take advantage of this to offer lower rates and thus draw traffic away from the independent trucking companies.<sup>1</sup> So far the railways have not been able to do this as may be indicated by the more rapid growth of trucking than piggyback since 1957. The TOFC movement of for-hire truck trailers between Montreal and Toronto has been interpreted as demonstrating a cost advantage by piggyback. But this was mainly the result of inadequate highway facilities especially near the Ontario-Quebec border.

A survey of major trucking firms in Canada<sup>2</sup> shows that firms that have carefully costed their comparable operations by piggyback and by highway have found substantial cost advantages in favour of highway service. On some 14 hauls in Ontario and Quebec, with various truck sizes and on various routes, the cost to trucking firms of using piggyback was on the average over 12 per cent higher per mile than direct highway service. On all of these hauls highway costs showed a cost advantage over costs by TOFC. The Montreal-Toronto route showed the least cost advantage by highway. It is on this route that the lowest TOFC rates are found.

The possibilities for piggyback to compete effectively with direct highway services appear to depend primarily on the ability of the railways to attract sufficient trailerloads to make regular two-way daily hauls of full trainloads of piggyback cars. Where this volume can be attracted, it may be possible that lower line-haul costs (and lower rates) will compensate in part for the extra costs and time required by trucking firms for delivering and picking up their trailers at TOFC terminals. Such trainload volume has developed on the Montreal-Toronto run.

Where full trainloads are not regularly available, and this was the situation on most TOFC routes in Canada in 1960, piggyback may have great difficulty in competing with direct highway service in costs and rates. Service competition may also be handicapped on routes where trainloads of trailers are not regularly available.

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In this competition between TOFC and direct trucking, service is evidently a most important element. The advantage in service appears to be held by trucking firms even when they use piggyback for the line haul. The disadvantages of the railways in this respect may be illustrated by the rate

<sup>1</sup> Competitive advantages usually attributed to piggyback ordinarily place low line-haul costs (not rates) high on the list. But traffic managers for several leading Canadian shippers indicate that Plan II rates are comparable to highway rates and Plan I piggyback gives no rate advantage to the shipper over truck rates. See, for example, *Canadian Transportation*, August, 1959, p. 39.

<sup>2</sup> This survey was carried out as a part of the studies undertaken for the Royal Commission on Transportation. See *Truck-Rail Competition in Canada*, in this volume.

at which Plan I (trucker-owned trailers) piggyback has outstripped the growth of Plan II (rail-owned trailers). With the tariffs quoted to shippers under these two Plans virtually identical, truckers were able to provide 75 per cent of piggyback loadings by 1960.

At the same time, the volume growth of intercity highway operations has been more rapid than total piggyback growth. For example, highway transport increased its share of total intercity ton-miles by 2.4 per cent from 1957 to 1959. Piggyback, making its most rapid growth in this same period, increased its share by about 1.5 per cent.

From 1957 to 1959, the railways' share of total intercity traffic, including piggyback, fell by 2.6 per cent. These data indicate that the growth in piggyback in Canada may have been largely the result of such a sharp shift of intercity traffic to trucks that it was desirable for both the railways and trucking firms to support TOFC service for truckers. At any rate, most of the increase in piggyback was provided by trucking firms' trailers. Yet the railways thereby recovered some of the traffic they were losing while truckers gained supplementary facilities to handle part of their increasing volume. Most of the increase in truck traffic was moved by highway, however.

Viewed in relation to competitive services, this suggests that growth of piggyback in Canada since 1957, while much more rapid than in the United States,<sup>1</sup> is mainly an increase in the trucker-owned trailers that have been hauled. And it appears warranted to attribute this part of the increase more to the competitive advantage of truckers' services which enabled the trucking firms to gain the additional traffic in the first place than to the low cost of piggyback rates or to piggyback services. The evidence indicates that the railways were aware of these trends when TOFC services were opened to for-hire truckers late in 1957, and that the aim was to recapture some of the traffic they were losing to trucks.<sup>2</sup>

On the other hand, the tendency of intercity trucking to grow in the face of TOFC competition may be attributed in the main to advantages in services by truck over rail, including piggyback.

For example, some of the services supplied with piggyback are those that have regularly been provided for conventional box car service. Services and advice on rates, on claims, on special handling instructions, and such, are handled by the same people for piggyback as for other rail traffic. In the main they are reported to be less effectively handled than those provided by trucking companies. The tendencies toward inflexibility, bureaucracy and

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<sup>1</sup> The best prospects for growth of TOFC in the U.S. are reported to be in Plans III and IV. As in Canada, the growth of piggyback using rail-owned trailers (Plan II) has been relatively slow. Truckers or the shippers themselves appear to have major advantages over the railways in providing pickup, delivery and other transport services, other than hauling.

<sup>2</sup> For example, H. B. Parr, assistant freight traffic manager, CNR, stated, "We've found that competition of reduced boxcar rates, coupled with Plan II piggyback has given truckers extra incentive to use Plan I service". *Railway Age*, January 4, 1958.

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emphasis on regulations and precedents rather than service, which have been a mark of standard rail services for many years, are not fully eliminated in piggyback service, although some progress has been made.<sup>1</sup>

Trucking companies have built up a reputation for readiness to provide individualized services, to discuss and advise on rates, to establish special rates quickly when necessary, to settle claims promptly and to ensure that the special instructions of the shipper are carefully carried out. Having the same driver from the beginning to the end of the trip, especially for perishables or high-valued traffic, may insure that shippers' instructions are more carefully interpreted and that individuals can be held directly responsible for failure to follow instructions. Piggyback trailers have at least three separate persons responsible for hauling them on each trip but highway transport ordinarily has only one. In general, the intercity transport drivers, especially those on long hauls, are better paid and usually better qualified than most truck drivers. Part of the advantage enjoyed by trucking companies over railways can be attributed to the extra attention given to the shippers' interests by these special driver-salesmen. This personal attention can thus be carried through from the shipper to the consignee. This means not only better public relations for the truckers but also that shippers get first hand encouragement to direct new business their way.

Another disadvantage for shippers is that piggyback does not provide service to many stations intervening between major industrial centres. The railways have been slow to extend service to these on-line cities,<sup>2</sup> no doubt because it would either be excessively costly to make special shipments or would slow down the point-to-point service by stops for switching. Piggyback's success depends on avoiding both of these, i.e., higher costs and delays, if it is to compete with trucking services.

Development of satisfactory TOFC service (and probably rates) appears then to depend mainly upon the volume of potential traffic and the degree of highway congestion. Thus, for Montreal-Toronto traffic the rates may be relatively low and the service highly satisfactory. But for routes with a lower traffic volume, development can be expected to be slower, rates probably higher and the service advantages of using them correspondingly less.

Piggyback competes best where full trains of trailers (Figure 6) can be shipped regularly each day or night, where such trains make no stops for switching at intervening points and where such full train traffic is in fairly close balance both ways. Only a few routes in Canada can meet these requirements yet. For those that do, piggyback has provided a valuable service, especially on those routes where highways are congested.

<sup>1</sup> That the railways recognize this problem may be indicated in their practice of leaving the management of purchased trucking firms in the hands of the former operators.

<sup>2</sup> *Railway Age*, January 13, 1958, p. 15.

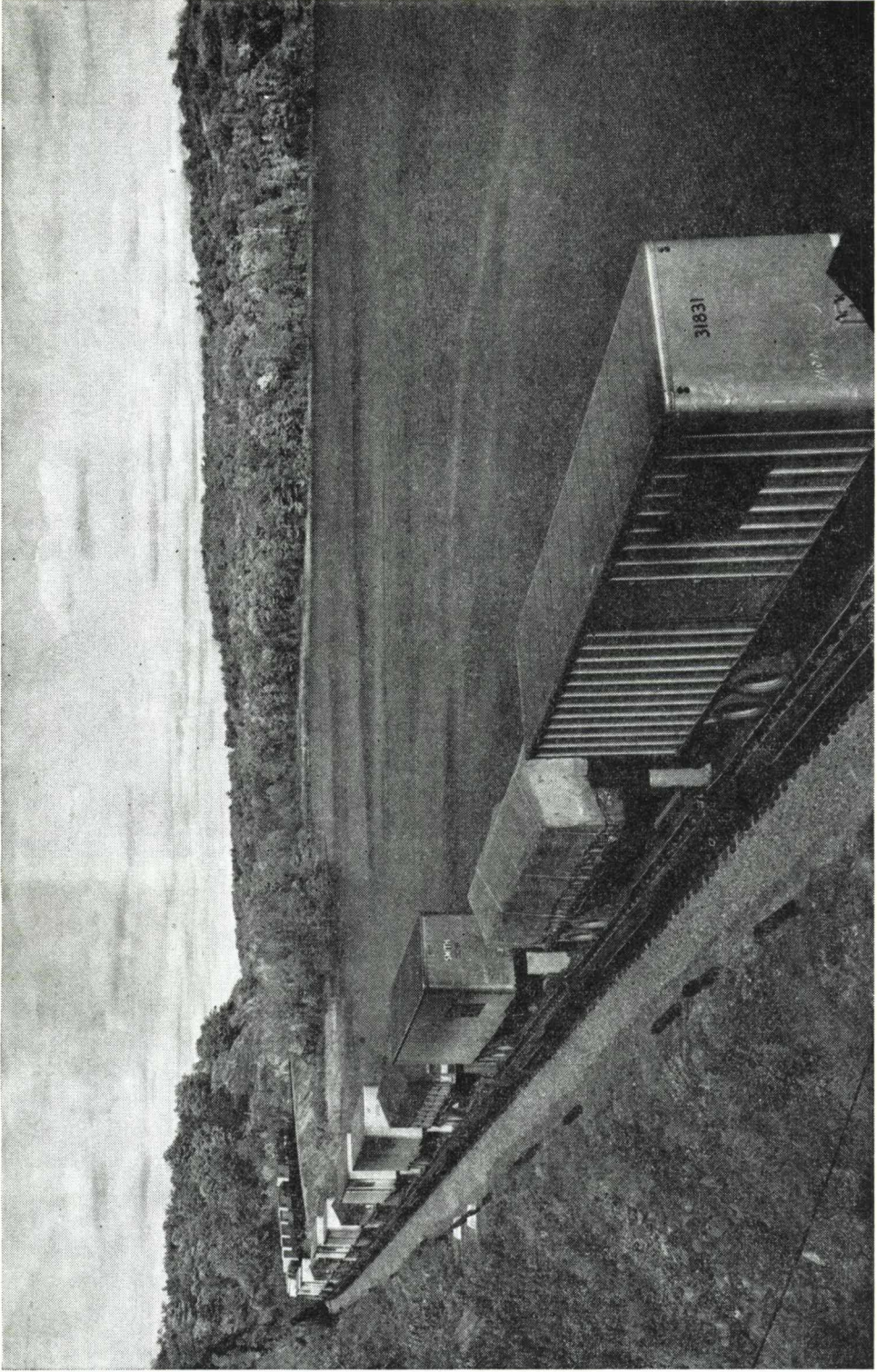


Figure 6

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At the same time, such point-to-point service leaves a considerable volume of traffic, destined for intervening points, that can only be handled effectively by trucks. In addition, for traffic destined for points closer to the origin than the piggyback terminal, direct shipment by truck may have substantial advantages in speed of delivery and in costs over piggyback. In this case, piggyback would require both extra loading and unloading of the trailer and greater mileage. It is in this area also that long-distance trucking has extra advantages over piggyback. The expansion of piggyback will tend thus to support long-distance trucking in this sector.

To for-hire trucking firms, however, piggyback had both advantages and disadvantages. The survey of trucking firms carried out for the Royal Commission indicated, from an overall view, that TOFC service would continue to be used by for-hire truckers but that its use would be limited to special rather than general traffic conditions.

The major disadvantages of piggyback to these trucking firms were that it was too costly relative to highway movements; that it could lead to a loss of their independence or the dominance of truckers by the railways; that overall it was slower than service by highway; that scheduling dock and P & D operations was more costly and difficult with piggyback; that TOFC service was less flexible than highway; that it provided little supervision and control of refrigeration; that it required more trailers than highway service required; that there was less opportunity for technological and cost improvements; and that trucking management lost some control over the services (speed, flexibility, etc.) provided to the shipper.

Against these disadvantages trucking firms reported some substantial advantages to be gained from piggyback. These advantages of piggyback were its benefits as a supplementary source of hauling power in special circumstances (e.g., peak load periods, for heavy or large-size loads, in "frost" periods, etc.); expansion of operations could be accomplished with a smaller investment; it permitted Sunday movements and extended Monday morning deliveries; trailers could be rebalanced between terminals without using tractors; there might be less exposure to accidents although insurance rates had not been reduced on this account; difficulties of adverse weather could be shifted to the railways; and some costs (e.g., licences) might eventually be reduced.

This survey of truckers showed that, after about three years of Plan I piggyback, much of their earlier enthusiasm for TOFC had been dissipated. The result was that the net gains and losses from use of piggyback were being more carefully calculated. Few firms had plans for any large-scale use of TOFC, most planned to confine its use more to special cases and many planned to reduce their piggyback when highway facilities improved, especially those between Montreal and Toronto. Yet it seemed evident that if TOFC



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rates were lowered or if highway conditions became more congested, or both, trucking firms would tend to increase their use of piggyback.

In summary, it may be seen that the service advantages of piggyback accrue perhaps more to the railways and trucking companies than to shippers. As far as service to shippers is concerned rail-owned TOFC (Plan II), which was about 25 per cent of piggyback handlings, had the disadvantage that some of its services (e.g., rate information, claim settlements, etc.) continued to follow the traditional railway pattern. On the other hand, TOFC services provided by rail-owned trucking companies (about 25 per cent of total handlings) does not suffer from these disadvantages because in the main these companies have been allowed by the railways to operate like independent for-hire truckers. The other 50 per cent of the trailers carried by piggyback are provided by independent truckers. In this case, as in the former, shippers see no difference in the service whether it goes by TOFC or highway. Yet, normally, highway service would appear to offer shippers some advantages over rail-owned (Plan II) piggyback.

On the other hand, for the railways and trucking firms, piggyback has been providing some important services. The railways have thereby been able to retain traffic they would otherwise have lost and to gain some new traffic through the acquisition of truck lines or through independent truckers faced with special conditions of congested highways, peak traffic, special or heavy loads of dry freight, etc.

As for independent trucking firms, aside from their use of TOFC under these special conditions, the disadvantages of piggyback services and costs appear to outweigh its advantages except for a limited volume of traffic. This indicates, assuming present TOFC rates are not reduced, that there is little likelihood of piggyback service supplanting highway operations for regular day-to-day traffic beyond these special requirements. The delays and other costs involved in moving trailers to the TOFC terminals, in loading and unloading at the ramps, in making up and starting piggyback trains constitute a major disadvantage in this respect.

Yet two considerations suggest the importance of the railways retaining the support of for-hire trucking on piggyback. The first consideration is that for TOFC operations to be efficient and profitable a fairly large (train-load) TOFC movement between terminals must be maintained. To ensure they have this necessary volume, the railways may need to depend for some time on the 50 per cent share of TOFC traffic now provided by independent for-hire truckers. Whether this Plan I traffic can be retained by the railways depends on several factors—on how soon the highway congestion between Montreal and Toronto is relieved, on whether TOFC rates on other routes are reduced, on the rate of growth in demand for trucking services and others.

## The Changing Pattern of Overland Transport

It will now be evident that, at the beginning of the 1960's, overland transport in Canada was in a stage of fairly rapid transition. The rapid growth of both piggyback and highway services, much of it at the expense of conventional box car traffic, are a measure of this change in the transport pattern. The major influences responsible for this continuing transition were the changes in conditions of competition—changes in costs and changes in the demand for, and supply of, transport services. In the long run, these changes in competitive conditions may be expected to alter the transport pattern further.

The trends in this direction are already becoming apparent. The competitive advantages of the railways in retaining their bulk, machine-loaded, trainload traffic may be expected to be maintained for some years. But the recent branching out of the railways into medium- and long-haul highway operations is a fairly clear indication they do not expect piggyback and conventional box car services alone to maintain their current share of traffic in the face of independent highway competition.

This conclusion is suggested also by the continuing decline of the rail share of intercity traffic, in spite of the development of TOFC service, as well as the railways' great efforts to modernize their facilities and services and make them more efficient. Part of this loss of railway freight has been the bulk traffic lost to pipelines and to water transport, including the Seaway. Part of the loss has been the traffic that has shifted to air transport and trucks. The traffic loss to trucks has been most significant because it is large and much of it has been the high-rated traffic on which the railways depended mainly for their profit.

Piggyback as well as railway modernization have tended to slow down the railways' loss of this traffic—piggyback by providing more competition in speed and service with trucks; modernization by enabling the railways to decrease the losses of bulk traffic to pipelines and water carriers.<sup>1</sup>

Yet truck transportation has continued to make substantial progress in drawing traffic away from the railways in spite of poor highways, load restrictions that greatly increase ton-mile costs and rates that must be charged to cover these costs. Indications are, however, that the trucking industry may have the advantage in future gains from technological improvements. Opportunities for traffic-attracting improvements from now on are likely to lie more with highway (and air) transport than with the railways.<sup>2</sup> The pro-

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<sup>1</sup> With dieselization and other improvements the average CPR freight-train load was increased by 500 tons since 1947 and the train speed went up 26 per cent, giving a 65 per cent increase in ton-miles per freight-train hour. See N. R. Crump, *Western Business and Industry*, August, 1959, p. 33.

<sup>2</sup> Pipeline traffic should also continue to grow rapidly of course, and water transport should expand as Seaway facilities come into wider use.

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posed extensions of the Trans-Canada highway system, the construction of throughways to eliminate traffic congestion, the development of tougher, less brittle pavements and the improvement of tractor and trailer units for truck transport appear destined, when combined with the numerous other innovations available to truckers in handling and service, to open for highway carriers many new avenues for rapid growth and expansion within the next decade.<sup>1</sup>

Piggyback has been injected into this competition between railways and trucks. But it would be wrong to assume that it has been a weapon directed by the railways with telling effect against truck competition. In fact, piggyback in Canada made little progress until the major independent trucking companies sponsored its extension to serve for-hire highway carriers.

In this dual role piggyback has been an effective supplement to the services of both railways and trucking companies. For the railways, piggyback has enabled them to hold much of the less-than-carlot traffic that had not been eroded away by truckers. It enabled them to develop pick-up and delivery services and feeder operations that could utilize line-haul rail facilities that were much lower in over-all cost than those available through conventional freight shed – box car services. It enabled them to hold and possibly to recover some of the high-profit traffic that has been most subject to truck competition. In the net result, piggyback has not been strong enough in competition to prevent the continued loss of the railways' share of traffic to independent trucking. But it has slowed the loss and has brought some new traffic by way of for-hire trailers (Plan I) to the railways. It may be expected to continue to play this important role as the railways extend their operations in the trucking field.

In trucking company operations piggyback plays a similar supplementary role. Most of its growth can be traced to this source. Piggyback has made it much easier for truckers to handle peak loads, to avoid congested highways and to expand operations by investing only in trailers. Piggyback can continue to serve for-hire trucking in these roles also.

In the main, piggyback growth in Canada may turn, as it has in the past, on the support given by independent for-hire trucking. It may be expected to expand also with the growth of the for-hire trucking subsidiaries of the railways. Chiefly because of this major emphasis on service to for-hire truckers, piggyback with containers may be relatively slow to expand in Canada. In the U.S., where containers hold promise of providing the means of standardizing a diversity of equipment, piggyback with containers may grow more rapidly.

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<sup>1</sup> Canada has not made as much progress in cross-country federally-supported highways and throughways as has the U.S. The development of trucking as a competitor of rail transport has lagged behind the U.S. development, as a result.

## Trends and Prospects

These broad changes developing in the pattern of transportation in Canada are the consequence of powerful and continuing influences operating in the economy.

Changes in the demand for and supply of transport services will be among the most dominant of these influences on transport. Shippers' demands for faster delivery, smaller and more frequent shipments, and more specialized and individualized service may be expected to expand, probably at an accelerated rate. Labour and other operating and investment costs will continue to be a major stimulus to transport agencies to reduce manual handling operations and costs to a minimum. Both of these, i.e., demands for more service and rising costs of handling, will support and maintain the shift of traffic from conventional box car services to piggyback and highway transport. L.C.L. traffic is likely to shift entirely from box cars within the next few years.

This movement from box car to piggyback and truck should accelerate during the next several years as more of the higher-rated traffic (manufactures, etc.) seeks the services of for-hire trailers. After that it will tend to slow down, as box car traffic becomes reduced mainly to bulk, machine-loaded commodities that can be handled most economically and conveniently by box or gondola rail car. Altogether, it has been indicated, as much as 25 per cent of current conventional rail box car traffic may move to truck and piggyback. The Royal Commission on Canada's Economic Prospects estimated that the railways' share of total for-hire transportation would fall from 50.8 per cent in 1960 to 44.9 per cent in 1970. Most of this loss would go to highway transport. But while trucks may attract the lion's share of the traffic lost by conventional rail services, a very substantial share will go to piggyback also.

A second major influence on the future transportation pattern will be a big expansion in the over-all demand for transport in Canada. The Gordon Commission estimated that total for-hire transportation will increase by 30 per cent from 1960 to 1965 and by another 28 per cent by 1970.<sup>1</sup> Much of this increase is expected to be in manufactures and other high-rated traffic which should expand the share of truck and piggyback traffic. A substantial increase in oil and gas traffic should expand pipeline movements.

In addition to this over-all growth in transport, the nature of transportation will continue to change in response to increased industrialization, urbanization and the concentration of industry around metropolitan market

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<sup>1</sup>Based on direct cost estimates. See *Final Report*, Royal Commission on Canada's Economic Prospects, November, 1957, page 283. U.S. transport requirements are expected to rise by 33 per cent from 1959 to 1965. See *Dun's Review and Modern Industry*, June, 1959, p. 60.

areas. These will go hand in hand with an expanded production of highly fabricated, high-value products and increase the demand for specialized transport services such as for-hire trucking has developed.

The division of this increased traffic between piggyback and truck will, of course, depend to a significant extent on the rate of highway development in Canada and on whether piggyback rates are revised downward relative to truck costs and rates.

Where highway construction lags behind the growth of freight traffic, highway congestion will result and more of the trailer traffic may tend to be shipped by piggyback.

Indications are that highway development will proceed faster in the future than it has in the past. The early completion of the Trans-Canada highway, the prospect that it may be soon extended, the continued expansion of throughways and superhighways and the rapid increase in total vehicle traffic that presses for even more and better highways, all point to a substantial long-run improvement in conditions for both local and long-distance trucking. Until this improvement occurs, increasing highway congestion will support the expansion of piggyback. As more superhighways are built and interprovincial highways are improved, the advantages of direct truck delivery will also improve and tend to lessen the dependence on piggyback as a means of circumventing road bottlenecks. In the meantime, piggyback may be looked upon as providing a useful alternative service during the transition—an alternative for both independent and rail-owned trucking companies.

Perhaps this may also explain partly the apparent discrimination in piggyback rates. If it does, it would suggest that these rates have been established at levels that are competitive with highway costs only on those routes (e.g., Montreal-Toronto) where the volume in the long run will be adequate to maintain trainload TOFC service. Looking thus toward long-run competition between highway and piggyback services, it seems unlikely that current piggyback rates would be modified downward.

Overall, while the demand for transport grows in Canada, the competitive structure and the comparative advantages of the various types of transport may be expected to change at the same time. The speed of these competitive changes has not been estimated here beyond those made by the Gordon Commission above. But the general direction of the competitive outcome may be broadly indicated.

Of chief concern here, in this respect, is the competition in overland transport, yet within the fields they serve, water, air and pipeline transport may be expected to change also. But water transport while large (it was 23.2 per cent of intercity ton-miles transported in Canada in 1958) is confined mainly to bulk, low-value traffic for which speedy delivery is not a major consideration. Air transport still plays a very small role in total freight

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handling in Canada. Pipelines have attracted the major volumes of oil and gas traffic but their field of competition has not reached beyond these yet in Canada.

Within the field of box car, piggyback and highway transport the competition promises to be keen during the next decade at least. It may take several years before a clear pattern for division of the traffic becomes generally established. But taking the long-run view, the competitive conditions of services and costs already indicate an identifiable pattern for the distribution of overland freight traffic.

The standard box car and gondola services will tend in the long run to handle mainly the bulk, mechanically loaded, relatively low-valued traffic like iron ore, coal and other mineral products, wheat for export and some forest products which can be hauled in trainload lots. Rail transport should retain this traffic for years unless water transport or pipelines (in some cases) are able to compete with it. This type of traffic may well maintain a substantial and increasing volume of handlings for the railways. Since it can be handled on a trainload basis, costs may be kept low enough to make it profitable even though it is low-rated traffic. The key to profits on this may well depend on making trainload through-hauls with switching and other lost time reduced to a minimum.

The most profitable of current box car traffic (manufactured goods, perishable farm products, etc.) will tend to demand highway and piggyback services, with most of it going to direct highway transport but some of it, especially where highways are inadequate going to piggyback for the time being. Because of these traffic losses to highway transport the railways will undoubtedly experience increasing difficulties in getting their operations on a profitable basis, even with the help of a profitable piggyback service, because piggyback may not reach beyond 10 to 15 per cent of total rail traffic, in the long run.

As a result of the continuing expansion of highway facilities, the technological improvements in highway freight equipment, the relative reduction in costs of trucking, and the continuing growth in demand for the more flexible and more specialized transport services that truckers can provide, the long-run tendency will be for a major expansion in highway trucking services. The volume of this expansion may be most marked at the medium-haul level as truck transport continues to extend its clear area of advantage over rail services (both piggyback and box car) from the present short (up to 250 miles) to medium (up to 500 miles) hauls, except where highway congestion may swing the advantage to piggyback.

But while medium-haul trucking may be expected to grow most in volume during the next few years, the most rapid *rate* of growth is likely to be in long-haul highway operations, as has been shown in another study in

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this volume. This continuing rapid competitive growth of long-distance trucking will reach further into an area of traffic which, until a few years ago, seemed reserved indefinitely to the railways. This encroachment on the last bastion of long-haul traffic has demonstrated, probably more clearly than any other factor, the relative decline in the competitive strength of the railways.

The demand for individualized and specialized transport services will continue to support extension of longer distance trucking. This demand will tend to be met in the main by for-hire truckers but it will be met also by shippers' private trucking services more than has been the case in the past.

This expanding role for trucking in overland transport and the parallel decline in the role of rail transport, at least in box car traffic, can be traced in the record of traffic changes that have already taken place. Indications that the railways recognize the significance of these trends are evident in the recent extensive investment by Canada's two railways in trucking companies, several of which are engaged mainly in long- and medium-distance hauling. Their choice in this respect indicates the railways have not purchased them entirely for pick-up and delivery purposes as feeder services for piggyback but also to engage in direct medium- and long-haul highway transport. These moves by the railways appear to have clear implications for the future of overland transport in Canada. They indicate that the long-run advantage tends to lie with highway transport. This has been confirmed by some senior railway officials.<sup>1</sup>

This does not mean that the role of piggyback will be short-lived and small. In fact, TOFC may continue to play a very important part. It may, for example, be an area of major profit prospects which makes it feasible for some railway operations to become financially sound again. It will, for the time being, be the major line of defence of the railways against competition from non-rail truckers for L.C.L. and box car traffic. It will provide a service that is useful both to for-hire truckers who may use it and the railways who provide it. For the long-haul traffic on which somewhat less speed, service and care is required than long-distance trucking usually provides, piggyback can probably meet shippers' needs effectively and at lower costs, though here cost advantages may depend on rate adjustments.

Piggyback may also develop a substantial role in low traffic areas. It has already been combined with trucking to provide many communities in the Maritimes with improved service.

Thus the role for piggyback in supplementing conventional rail services on the one hand and highway service on the other, is likely to continue to be important for future years. Its growth rate has levelled off and will be slower than it has been in the past.

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<sup>1</sup> Dr. O. M. Solandt and A. H. Hart, both CNR vice-presidents, have indicated this in recent statements.

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Thus piggyback could well reach 10 per cent or more of total rail carloadings by 1965. This may not be enough to equal the railways' loss of traffic to highway trucking but it will offset some of it. Growth of the railway companies' trucking operations may compensate for some more of it.



## U.S. PIGGYBACK PLANS

### PLAN I: Railroads and motor common carriers

*Plan I—Railroads carry trailers owned by motor common carriers, on a "division" of the truck rate—actually in practice a flat charge per trailer based on weight and distance, regardless of commodity. The trucker solicits and bills all freight at truck rates; takes trailers to, and picks them up from, railroad piggyback terminals; and performs any required road-haul before or after the rail movement. The railroad has no direct contact with the shipper, and simply substitutes for the trucker on part or all of the total road-haul.*

### PLAN II: A railroad operation, door-to-door

*Plan II—Railroads carry their own trailers, under their own truck-competitive tariffs. Under this all-rail plan, the railroad deals directly with shippers; furnishes all equipment; and provides pick-up and delivery between shipper plants and rail terminals, either by railroad-owned tractors or by contract with local draymen. P & D is usually confined to established territories contiguous to rail terminals.*

### PLAN III: Shipper trailers, rail cars

*Plan III—Railroads carry trailers owned or leased by shippers, at a flat rate per mile. The shipper delivers trailers to railhead; the railroad puts them aboard flat cars, ties them down, transports them to destination and grounds them; the shipper picks them up at the rail terminal.*

### PLAN IV: Shipper trailers, shipper cars

*Plan IV—Railroads carry trailers owned or leased by shippers on flat cars also owned or leased by shippers, at a flat charge per car, whether trailers are loaded or empty. The shipper takes his trailers to and from the rail terminal, and loads and unloads cars. The railroad performs terminal-to-terminal line-haul movement only.*

### PLAN V: Joint rates, truck-rail-truck

*Plan V—Railroads carry their own trailers, or common-carrier truck trailers, under joint rail-truck rates on an end-to-end basis. Operationally, Plan V is similar to Plan I, but is a true joint operation, which, in effect, extends the territory of each participating carrier into that served by the other; permits each participant to handle shipments originating in or destined to the other's territory; and allows each to sell for the other. Normally, this plan involves a truck road-haul on one or both ends of the rail movement.*

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SOURCE: *Railway Age*, March 28, 1960, p. 74.