

THE ROLE OF TRANSPORT IN THE DEVELOPMENT OF AN  
 AGRICULTURAL REGION: GRAIN TRANSPORT IN THE PRAIRIE  
 REGION OF CANADA\*

by

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## 1. INTRODUCTION

This paper argues that a distinction should be made as to the purpose (and effects) of transport policies as an agricultural region develops. Conceptual issues in transport and development are reinforced by a review and synthesis of studies on grain transport in the Prairie region of Canada. We believe this paper is relevant to the Conference theme "Research for Transport Policies in a Changing World" in that it illustrates how an important policy tool, transport, has been used (and misused!) in fostering the growth of an agricultural region. Many of the current issues relate to the "equity" impacts of changing long established transport policies. This paper also illustrates some important lessons for developing countries where transport problems are a major drawback to agricultural development.

## 2. TRANSPORT AND AGRICULTURAL DEVELOPMENT: CONCEPTUAL ASPECTS

Transport and its related policies have always been subject to public scrutiny, primarily because they can facilitate trade and therefore have a potential to stimulate regional growth. Both Canada and the United States used transport as a development tool at the time of westward expansion. Since then, transport subsidies have been criticized because they often result in a non-optimal location decisions and resource misallocation. The purpose here is not to resolve the effectiveness of transport as a regional development tool, but to briefly discuss it in concept.

Transport subsidization normally is in the form of provision of infrastructure and/or rate subsidies, and both have been used in the development of western Canada. Late in the nineteenth century, the government wanted to ensure that the western U.S. railways would not penetrate into Canada. An all Canadian railway route would protect western Canadian resources from being exploited by the U.S. Government encouragement to the railways took the form of land grants

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and other direct and indirect subsidies. It is important to emphasize that this encouragement was necessary because the railways were not willing to independently and unilaterally undertake the risk. Therefore, government subsidies of transport facilities were necessary to act as a stimulant to expansion, to reduce the financial risks associated with railway construction in an undeveloped region, and to ensure against U.S. penetration into western Canada.

Government intervention in transport policy for development purposes has continued even though some economists contend that the role of government should diminish. Specific and implicit subsidies and rate differentials between raw and processed products are both at issue. The usual criticism is that these policies encourage non-optimal location decisions and misallocation of resources. It is alleged that the statutory rates in particular resulted in more resources being devoted to Prairie agriculture, and grain production specifically. It was recognized in the 1960's that if grain exports were to be subsidized such

"indirect and even sloppy ways of doing it [were] inappropriate."<sup>1</sup>

From an economic perspective, transport is a factor of production, conceptually no different than land, labor, or capital; it produces place utility and its demand comes about because production and consumption are normally in different places. Consequently, there is not an a priori reason for subsidizing transport vis-a-vis other inputs to encourage development. In fact, subsidization of other factors may be preferable, so as not to encourage non-optimal location of production and processing. In an argument against transport subsidies for development purposes, Wilson has postulated the Grand Transportation Mystique, which was a

"belief ... that transportation investments and freight rate reductions possess some special properties as far as providing a stimulus for economic growth."<sup>2</sup>

The marketability of a product depends on its price, quality, sales effort and preferences. Further, since the proportion of freight cost in the value of a product is relatively small, transport as a stimulant to economic growth would be ineffective. He concludes:

...in a dynamic developed region, it is clear to me that the role of transportation has become less effective in changing regional patterns of trade and development. At the same time it has apparently become increasingly more costly to use transportation for these purposes.<sup>3</sup>

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<sup>1</sup>G.W. Wilson and L. Darby, Transportation on the Prairies, Special study prepared for The Royal Commission on Consumer Problems and Inflation (Government of Canada), 1968, p. 33.

<sup>2</sup>Ibid., p. 14.

<sup>3</sup>G.W. Wilson, "The Role of Transportation in Regional Economic Growth," in E.W. Tyrchniewicz and O.P. Tangen, Transportation and Regional Development, Center for Transportation Studies, University of Manitoba, Winnipeg, December 1970, p. 61.

Wilson is referring to two types of costs of using transportation as a regional development tool. The first is that subsidy costs become increasingly expensive as the proportion of freight costs in the value of the product decrease. The second cost refers to the cost of misallocated resources due to subsidized transport.

Despite these relatively negative attitudes regarding the usefulness of transport as a development tool, there are some positive aspects. Under the right conditions, transport can be effective in stimulating growth in a region where resources would otherwise be unemployed. Heads developed a conceptual model to test the efficiency of transport subsidies vis-a-vis other subsidies in increasing the output of a region. Underlying assumptions of his model were that regional output, and therefore employment and income, should be increased, and that the smallness of the regional market area was the major problem. The analysis indicated that subsidies on output and line-haul transport charges were equally efficient and less costly than subsidizing a specific factor. A subsidy on line-haul transport costs was the most efficient if the objective was to increase regional output and minimize the subsidy costs. The model was oriented to the use of transport subsidies to reduce regional income and growth disparities in Canada, and therefore concerned with resources which would otherwise be unemployed. If transportation were

"to be used to promote regional economic development, there would seem to be a need for selective reductions in freight rates on shipments of finished products from the slow growth areas."<sup>5</sup>

An underlying assumption is that the increased output could be sold at the more distant markets.

Implicit in the complexity of the present discussion is that specific conclusions cannot be drawn. It is true that in a developing economy, transport facilitates trade which encourages specialization and division of labor, thereby increasing productivity. Further, in slow growth areas, transport subsidies can be used to stimulate employment if smallness of the market is the problem. However, in a developed economy, transport is no different than other productive inputs. There are other factors, such as labor costs and size of the consumption center, which influence location decisions, and transport charges are a relatively small portion of the value of commodities. Therefore, intentional transport subsidies for growth purposes may be exceedingly costly in direct financial terms, as well as in terms of resource misallocation.

### 3. THE GRAIN FREIGHT RATE SITUATION

The most pressing transport problem in Canadian Prairie agriculture is not the ability of transport to stimulate regional development or employ otherwise unemployed resources. Rather it is to transform the present grain handling

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<sup>4</sup>J. Heads, "Transportation Subsidies and Regional Development," Unpublished Ph.D. Thesis, Department of Agricultural Economics, University of Manitoba, Winnipeg, 1976.

<sup>5</sup>Ibid., p. 261.

TRANSPORT AND AGRICULTURAL DEVELOPMENT by: E.W. Tyrchniewicz and W.W. Wilson

and transport system, which is in a deteriorated condition, hampered by insufficient revenues and technical and pricing inefficiencies, to one which is efficient and adequately facilitates trade. The transition entails both political and economic tradeoffs.

Rail rates on grain and grain products (commonly known as statutory grain rates) have not increased since 1897 and inflation has put upward pressure on rail costs. Concerns have been expressed since at least the MacPhearson Commission (1961) that rail revenues do not cover costs. In fact, that Commission made recommendations which, if followed, would have likely precluded many of the present day transport problems. More recently, the Snavely Commission (1976) confirmed that rail costs exceed the revenue from grain and grain products. The major findings of the Commission for 1974, and subsequently for 1977 and 1980 are shown in the following table.

The important point of the Snavely Commission results is the acceptance that rail revenues are insufficient to cover the cost of transporting statutory grain. Also, it was recognized and accepted that there is an implicit subsidy to the grain shipper from the government (from the branch line subsidy program and covered hopper car ownership) and railways (in terms of depressed revenues). However, the benefits of the subsidy (the extent to which costs exceed revenues) are not retained in toto by the grain shipper. Several studies indicate that grain importers also benefit from the subsidy in terms of lower prices.

The studies indicate that increased statutory grain rates would put both downward pressure on the farm gate grain price and upward pressure on the price to the importer. As the farm gate price decreases, Canadian grain production would decrease putting upward pressure on world grain prices. Consequently, farm gate grain prices fall but not by the full amount of the rate change. In other words, an increase in the grain rate would be shared by the consumer and supplier. This concept can be construed to mean that the present implicit subsidy to grain producers is shared by the grain importing countries. The relative portion of the subsidy benefitting each of the participants depends on the elasticity of the export demand for Canadian grain. Estimates indicate that Prairie wheat producers retained 76 percent, 84 percent and 96 percent of the implicit subsidy in 1974, 1975 and 1976 respectively.<sup>6</sup> Similar analysis for rapeseed indicated that only 42 percent of the implicit subsidy was retained by the rapeseed producer, the remainder was a benefit to the Japanese and EEC importers.<sup>7</sup>

Many recent studies in transport and regional development in western Canada have been concerned with how economic activity would be re-allocated should the transport rates on grain and grain products be increased. The general

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6. J.G. Nagy, W.H. Furtan and S.N. Kulshreshtha, "The Canadian Wheat Economy: Economic Implications of Changes In the Crowsnest Pass Freight Rates," Department of Agricultural Economics (Saskatoon: University of Saskatchewan, January 1979).

7. W.H. Furtan, J.G. Nagy and G.G. Storey, "The Impact on the Canadian Rapeseed Industry from Changes in Transport and Tariff Rates," American Journal of Agricultural Economics, May 1979, pp. 238-248.

TRANSPORT AND AGRICULTURAL DEVELOPMENT

by: E.W. Tyrchniewicz and W.W. Wilson

Table 1

Cost of Transporting Grain by Rail in Western Canada  
1974, 1977, and 1980

Source of Cost Coverage	Total Dollars (Millions)	\$/ton	% of Coverage
<u>1974</u>			
User of the Service	\$ 89.7	\$ 4.36	36.3%
Federal Government	54.4	2.64	22.0
Railways	<u>103.0</u>	<u>5.00</u>	<u>41.7</u>
TOTAL	<u>\$247.1</u>	<u>\$12.00</u>	<u>100.0%</u>
<u>1977</u>			
User of the Service	\$114.8	\$ 4.45	32.4%
Federal Government	78.6	3.05	22.2
Railways	<u>160.5</u>	<u>6.23</u>	<u>45.4</u>
TOTAL	<u>\$353.9</u>	<u>\$13.73</u>	<u>100.0%</u>
<u>1980</u>			
User of the Service	\$132.9	\$ 4.46	24.3%
Federal Government	170.2	5.72	31.1
Railways	<u>244.4</u>	<u>8.21</u>	<u>44.6</u>
TOTAL	<u>\$547.5</u>	<u>\$18.39</u>	<u>100.0%</u>

Source: Snavelly, King and Associates, 1980 Costs and Revenues Incurred by the Railways in the Transportation of Grain Under Statutory Rates (Ottawa: Prepared for the Grain Transportation Directorate, Transport Canada, January 1982), p. 192.

conclusions of some of these studies are presented. The various studies are not strictly comparable because the methodologies and level of aggregation are different in each. Before presenting the conclusions, a general conceptual framework for regional production and the location of processing (which is the implicit theoretical framework used in these studies) is discussed.

Conceptually, each region can be thought to have a "production possibility curve" which indicates the combination of products that can be produced from that region's resources (see Figure 1). This indicates that increases in the production of one product requires a reduction in the production of other products. The shape and relative size of a region's production possibility curve depends on initial resource endowments in that region. For example, land may be better suited for grain production relative to livestock production and the curve will be skewed to indicate that (see Figure 1). The output combination produced is determined by the relative product prices. If the price of one product decreases, its production will decrease and that of the other product will increase. However, it is easier for some regions to respond to product price changes than others. The underlying logic of most of the following studies is that increases in transport costs on grain and grain products will reduce the farm gate price of grain which will induce production shifts (see Figure 2). Specifically, grain production will decrease and livestock production will increase. Livestock production will also increase because feed grain prices for local use will decrease.

A second concept important in the allocation of economic activity is that changes in the statutory rates will affect the relative freight rates on raw and processed products and therefore the location of processing. The underlying concept is as follows. Processing of most agricultural products results in weight loss, and therefore processing would tend to be located close to the primary source of raw material (e.g., grain), provided that the transport costs per unit of weight are the same for both raw and processed products. On the other hand, if processing results in weight gains, it would be located close to major consumption areas. Conceptually, location of processing depends on the relative transport costs and weights of the raw and processed products. An underlying assumption in this simple relationship is that all other factors affecting location of processing, such as labor availability and cost of processing are the same at both locations.

In practice, the processing of most agricultural products results in weight loss (i.e., livestock feeding and processing and rapeseed crushing) and would be located close to the source of the raw material in the absence of unfavourable rate differentials. Even though the process is weight-losing, if the transport cost differentials between the raw and finished products are sufficiently large, the location of processing may still be near the point of consumption. A change in the statutory rates on grain may encourage processing of agricultural products within the Prairies by reducing the freight rate differential between raw and processed products.

The studies cited in Table 2 all relate to the reallocation of economic activity resulting from an increase in the statutory grain rates. The direction of the changes are consistent in all cases by the magnitude of

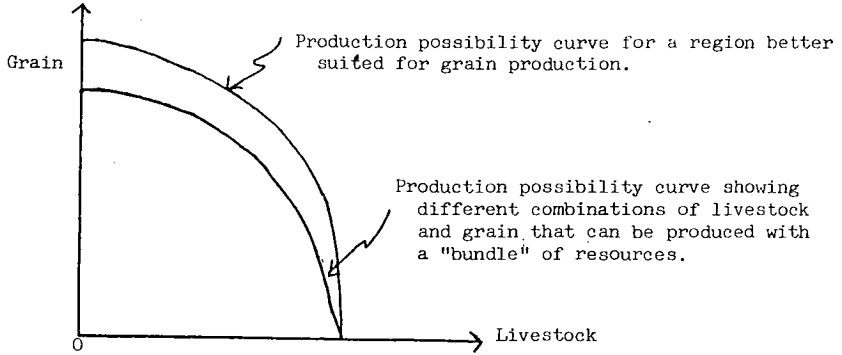


Figure 1. The Concept of a Region's "Production Possibility Curve"

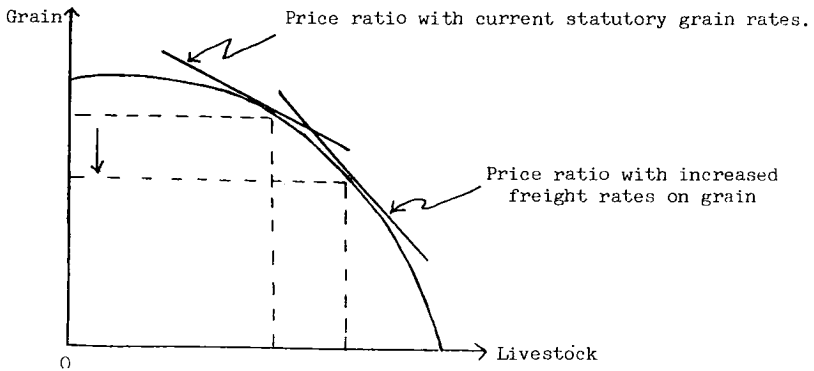


Figure 2. Conceptual Effect of a Change in Grain Freight Rates on Regional Agricultural Production

Table 2

## Studies Assessing the Impact of Changes in Statutory Grain Rates

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1. P. Arcus, "The Impact of Changes in the Statutory Freight Rates for Grain," in R.M.A. Loyns and E.W. Tyrczniewicz (eds.) Freight Rates and the Marketing of Canadian Agricultural Products, Department of Agricultural Economics, University of Manitoba, 1977.
  2. M. Anderson and W. Hendricks, Review of Crow Rate Implication for Alberta Agriculture, Special report prepared for the Government of Alberta, 1977.
  3. Saskatchewan Transportation Agency, The Crow Rate and National Transportation Policy, Government of Saskatchewan, 1977.
  4. G.A. MacEachern, Retention of the Crow Rate and the Alberta Livestock Economy, Special report prepared for the Alberta Cattle Commission, 1978.
  5. E.W. Tyrczniewicz, et al., "The Abandonment of Uneconomic Branch Lines and Unremunerative Grain Rates: Effects on Agriculture and Regional Development," The Logistics and Transportation Review, Vol. 14, No. 4, 1978.
  6. J.G. Nagy, W.H. Furtan, and S.N. Kulshreshtha, "The Canadian Wheat Economy: Economic Implications of Changes in the Crowsnest Pass Freight Rates," Department of Agricultural Economics, University of Saskatchewan, 1979.
  7. W.H. Furtan, J.G. Nagy, and G.G. Storey, "The Impact on the Canadian Rapeseed Industry from Changes in Transport and Tariff Rates," American Journal of Agricultural Economics, May 1979
  8. D. Harvey, Christmas Turkey or Prairie Vulture? An Economic Analysis of the Crows Nest Pass Grain Rates, Institute for Research on Public Policy, 1980.
  9. K. Olsen, E.W. Tyrczniewicz, and C.F. Framingham, Impact of Changes in Statutory Grain Rates on Manitoba's Agricultural Economy, Special report prepared for the Government of Manitoba, 1980.
  10. D. Harvey, Burdens and Benefits as the Crow Flies, Special report prepared for Agriculture Canada, 1982.
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the estimated changes vary depending on the underlying assumptions and level of aggregation. In conclusion, the consequences of an increase in statutory grain rates can be summarized as follows:

1. Farm gate grain prices should decrease with corresponding reductions in grain production, exports, and income to the grain producer. Grain prices for local use should decrease (i.e., feed grains and rapeseed prices to crushers) thereby increasing the level of these activities.
2. Western livestock production should increase because of a shift from grain to livestock production and because feed grain prices decrease.
3. The change in net income in any given region depends on its ability to shift production in response to changing output prices.
4. There should be an increase in agricultural processing on the Prairies.
5. No change in statutory grain rates would aggravate the economic distortion against livestock production and agricultural processing in the Prairie region of Canada.
6. New markets will have to be found outside the Prairie region for the increased production of livestock and other processed agricultural products.

At the policy level, the initial response was a variety of ad hoc measures by the Federal and Provincial governments to meet the growing deterioration in the grain transportation system. By 1982, the increasing costs and the growing evidence that the ad hoc measures were not leading to an effective solution to the basic problems in grain transportation led many to conclude that a more comprehensive approach was necessary. In February 1982, the Federal government released a policy statement on western rail transportation and announced the establishment of a consultative process. The consultative process was headed by a Federal representative, Dr. J.C. Gilson, and included the two national railway companies, nine major farm organizations, and one group of processing companies.

The Federal representative submitted his report<sup>8</sup> in June 1982, and, at the time of writing of this paper, the report is being publicly debated. It is expected that the report will form the basis of new legislation to be introduced in Parliament in early 1983. The thrust of the recommendations can be summarized as follows:

1. A comprehensive, rather than an ad hoc approach must be taken to solving the grain transportation problem of western Canada.

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<sup>8</sup>J.C. Gilson, Western Grain Transportation: Report on Consultations and Recommendations, Transport Canada, June 1982.

## TRANSPORT AND AGRICULTURAL DEVELOPMENT

by: E.W. Tyrczniewicz and W.W. Wilson

2. All parties involved in grain transportation (Federal government, railways, and grain producers) must make a significant financial contribution to the development of an efficient grain transportation system, taking account of each group's capacity to absorb costs.
3. The Federal government should pay the 1981-82 railway revenue shortfall of \$644 million on a continuing annual basis, initially to the railways and gradually shifting the payment to grain producers.
4. In return for being adequately compensated, the railways are expected to provide certain performance and service guarantees, including investment expenditures in grain transportation capacity.
5. Grain producers should share in the increasing costs of grain transportation.
6. Increased efficiency and economy measures should be promoted in the operation of the grain transportation system.
7. Certain freight rate anomalies that discourage the processing of agricultural products on the Prairies should be removed.
8. There should be periodic reviews of the new legislation and measures to ensure that the approach adopted was achieving what was originally intended.

## 4. SOME LESSONS FOR DEVELOPING COUNTRIES

Transport is generally viewed as a key agricultural developmental tool in developing countries. There is a remarkable similarity between the situation that existed in the Prairie region of Canada in the latter part of the nineteenth century and what is found today in many agricultural region in developing countries. Namely, an agricultural production potential, but an inadequate (or non-existent) transport system to bring in other production inputs and to export surplus agricultural production to food deficit regions.

Thus, a transport policy aimed at developing a transport infrastructure is very appropriate for early stages of development. Once the infrastructure is in place, careful attention must be given to the use of transport policy (especially freight rates) for the development of markets for surplus agricultural products, including the distribution and location of processing of these products. The developmental nature of Canada's grain transport policies in the latter part of the nineteenth and the first half of the twentieth centuries resulted in tremendous expansion of the agricultural production potential of the Prairie region. However, as the Prairie region "matured," these same policies were largely responsible for a deterioration in the grain transport network and the increasingly non-optimal location of agricultural production and processing.

An important lesson for developing countries from the Canadian experience is the critical importance of adjusting transport policies from developmental objectives to objectives of facilitating trade as a region (or country) moves to a more "mature" developmental stage. Failure to make such adjustments inevitably results in costly (and often ad hoc and ineffective) counter-measures.