THE SIGNIFICANCE OF THE CROW'S NEST PASS FREIGHT RATES IN THE PRODUCTION AND PROCESSING OF AGRICULTURAL PRODUCTS IN WESTERN CANADA

An Evaluation

by

Peter L. Arcus

Department of Regional Economic Expansion
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Saskatoon, Saskatchewan
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INTRODUCTION

This paper addresses the question of the significance of the Crow's Nest Pass Freight Rates for agricultural production and processing in Western Canada.

The Crow's Nest Pass Freight Rates came into existence in 1898 and 1899 and since 1925 have been held at the 1899 levels by federal statute. So long as Western Canada was still developing it is generally thought that these rates were probably not significantly different from the rates that the railways would have charged had they not been constrained by law to the Crow's Nest Pass Rates. This is thought by some to have been the case through the late 1940's. However, more recently costs of railway operations have increased to a point where it seems likely that there is a considerable difference between the costs incurred by railways in moving grain in Western Canada and the revenues which they receive from moving this grain at the Crow's Nest Pass Freight Rates. This report addresses the question of by how much and in what directions the Crow Rates now influence agricultural production and processing in Western Canada.

The report consists of four major sections. In the first, the historical background on the Crow's Nest Pass

Freight Rates is presented. The section coyers the initial establishment of Crow's Nest Pass Freight Rates for grain and flour and the subsequent modifications and additions to these rates from 1897 to 1976. The second part of the report presents a summary of the Crow's Nest Pass Freight Rates as they exist in 1976. Examples of the various rates are given, commodities and routes are identified and the Crow Rate schedule is analyzed in a form which results in the schedule being presented in the form of two equations.

In part three, an alternative to Crow Rates, namely a market rate for export grain transportation is examined. First the concept is elaborated, then estimates of likely market rate levels for Crow Rate commodities are made and presented.

In the fourth section, estimates of the benefits of costs of the Crow Rates to Western Canada are presented. The benefit of the Crow Rates are measured in terms of the changes in production which would occur if market rates replaced Crow Rates for export grain. The effects on grain production and revenues and livestock production and revenues are examined. As well, a number of secondary effects are examined. Finally, consideration is given to regional effects of the Crow Rate, both in terms of the location of production

and processing in the West as opposed to the eastern part of the country, and in terms of provincial and local effects within the prairie region.

Conclusions are drawn and a summary is presented at the end of the report.

BACKGROUND

The Crow's Nest Pass Agreement

In 1897, the Government of Canada entered into an agreement with the Canadian Pacific Railway Company under which the Company would build a railway from Lethbridge, Alberta, through the Crow's Nest Pass in the Rocky Mountains, across southeastern British Columbia to Nelson, British Columbia, and the Government would provide a subsidy of $11,000 per mile towards the construction of this railway.[1] On account of the route taken by the railway, the agreement came to be known as the Crow's Nest Pass Agreement. It was signed in September, 1897. Earlier that year, legislation had been passed enabling the Government to enter into such an agreement.[2]

In addition to spelling out the terms upon which the railway would be constructed and the amount of the subsidy to be paid, the agreement contained several other clauses. These related to:

(a) the location of the line relative to the Town of McLeod, Alberta;

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[1] For a copy of the Agreement, see Appendix A.

[2] Statutes of Canada. 60-61 Victoria. Chapter 5. "An Act to Authorize a Subsidy for a Railway Through the Crow's Nest Pass." June 29, 1897.

(b) a requirement that the rates and tolls from all points on the new railway to all points elsewhere on any company's railways become subject to Government approval;

(c) a reduction in the general rates and tolls of the railway for a list of items generally known as "settlers' effects", from points east of Thunder Bay (then Fort William) to points west of Thunder Bay;

(d) a reduction in the rates and tolls applicable to grain and flour moving from points west of Thunder Bay to or beyond Thunder Bay;

(e) the assumption by the Government of Canada of control over the running rights on the new railway and all other railways south of the Company's main line in British Columbia;

(f) the subjection of the new railway, plus all other railways in British Columbia south of the CPR mainline, plus that portion of the CPR railway between Dunmore (near Medicine Hat)

and Lethbridge, to the provisions of the Canada Railway Act and any other Acts of the Parliament of Canada relating to railways;

(g) limitations on the conditions of any sale by the Company, of lands granted to it by the Province of British Columbia as a consideration for building the Crow's Nest Pass railway;

(h) the conveying of 50,000 acres of coal-bearing lands obtained by the CPR in the land grant from the Province of British Columbia for building the Crow's Nest Pass railway, to the Government of Canada which might then, inter alia, mine the coal and sell it to the public at prices not exceeding $2.00 per short ton free on board at the mines; and,

(i) a provision to exclude foreigners from working on or owning, leasing or otherwise controlling the new railway.

Thus, the Crow's Nest Pass Agreement was intended to achieve certain other goals for both the railways and the Government at that time, in addition to the construction

of a railway. Amongst these goals was the reduction of tariffs on grain and flour moving out of the west to Thunder Bay and points east of Thunder Bay.

The reduction in rates for grain and flour was implemented over a two-year period between 1897 and 1899. An initial reduction of 1½¢ per 100 lbs. was made in 1898. The reduction applied to rates for grain, flour, oatmeal, mill stuffs, flaxseed, oilcake, potatoes and hay.

A second reduction, also of 1½¢ per 100 lbs., was made in August, 1899. However, this reduction applied only to grain and flour, oatmeal and mill feeds. Flaxseed, oilcake, potatoes and hay were no longer in the schedule affected by the 1899 changes. Thus, while rates on grain, flour, oatmeal and mill stuffs were reduced 3¢ per 100 lbs., rates on flaxseed were only reduced 1½¢ per 100 lbs. The difference continues to date.

The rates established by the end of 1899 became known as the "Crow's Nest Pass Freight Rates". A sample of these rates appears in Table 1.

Table 1:

Crow's Nest Pass Freight Rates to Thunder Bay From Three Prairie Shipping Points, 1899[a]

Shipping Point	Rate (cents/100 lbs.)
Winnipeg	14
Portage La Prairie	15
Brandon	16

The rates in Table 1 applied from 1899 to 1903.

In addition to reducing the rates for grain and flow, the Crow's Nest Pass Agreement brought about a reduction in the freight rates for settlers' effects, commencing in 1898. The amount of the reduction depended on the commodity being transported and reductions ranged from 10 percent to 33 1/3 percent.

The Manitoba Agreement

In 1903, the Crow's Nest Pass Freight Rates succumbed to competitive pressure originating in an agreement between the Government of Manitoba and the Canadian Northern Railway made in 1901. Under this agreement, known as the

[a] For grain and flour; CPR only, at that time.

Manitoba Agreement, rates for grain and flour from Winnipeg to Thunder Bay on the Canadian Northern tracks were reduced. After some delay and in order to retain its share of the grain traffic on its parallel route, the CPR reduced its tariffs for the Winnipeg to Thunder Bay sector by three cents per 100 lbs. in 1903. Rates from Saskatchewan and Alberta to the Lakehead were reduced (voluntarily) by two cents. Rates for "settlers' effects" were also reduced. The resulting rates applied from 1903 to 1918.

By 1918, the inflationary pressures generated by the First World War were bearing heavily on the railways as well as other segments of the Canadian economy. Accordingly, in that year action was taken, first by the Board of Railway Commissioners who raised the freight rates for grain and flour to Crow levels. Later, the Government acting under the authority of the War Measures Act of Canada, acted to free the railway freight rates from both the Manitoba Agreement and the Crow's Nest Pass Agreement. Consequently, freight rates rose fairly rapidly thereafter and, by 1920, had attained levels of approximately six cents above those prevailing in 1918.

Statutory Rates

By 1922, the effects of World War I on prices had

passed and a return to the Crow's Nest Pass Rates for grain and flour was proposed. This was achieved by an amendment to the Railway Act.[1]

Two points are notable in regard to the return to the CNP rates in 1922. First, the CNP rates had, until this time, been "agreed-upon rates" by virtue of the Crow's Nest Pass Agreement. By transferring these rates in the Railway Act in 1922, the Crow's Nest Pass Rates ceased to be agreed rates and became statutory rates. Secondarily, the action taken in 1922 affected only the rates for grain and flour immediately. The rates applicable to "settlers' effects" were not restored to the Crow's Nest Pass Agreement levels until 1924.

Upon the return of the rates for grain, flour and "settlers' effects" to the 1899 levels in 1924, a difference of opinion developed over the application of the Crow Rates. On the one hand, the CPR took the position that the "Crow Rates" should apply only to those points on the railway existing in 1897, 289 points. On the other hand, the provinces of Manitoba, Saskatchewan and Alberta argued that this position constituted unjust discrimination pursuant to

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[1] Statutes of Canada. 12-13 George V. Ch. 41. "An Act to Amend the Railway Act 1919", June 28, 1922.

the Railway Act and took the position that all points on the railway in 1924 should be eligible for Crow rates, 1,630 points. The matter was taken to the Supreme Court of Canada for resolution. The Court decided in favour of the CPR.[1]

This decision by the Court gave rise to a situation where customers at the new points on the railway (points established since 1897) were to pay higher rates than those customers doing business at the old (1897) points railway, even though many points were equidistant from Thunder Bay. A solution to this problem was found by relieving the railways of the obligation to carry "settlers' effects" at the "Crow's Nest" Rates and requiring them instead to carry grain and flour to Thunder Bay at the Crow's Nest Pass Rates from all points in the west, irrespective of whether the point was established before or after 1897. This end was achieved by an amendment to the Railway Act and was completed on June 27, 1925. Thus, by the end of 1925, the Crow's Nest Pass Freight Rates had been extended to cover the transportation of all grain[2] and flour between

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[1] Canada Law Reports, pp. 155-177. Supreme Court of Canada, 1925. Governments of Alberta, Saskatchewan and Manitoba versus Canadian Pacific Railway Company. February 3-6, 26, 1925.

[2] "Grain" also included flaxseed.

all points west of Thunder Bay and Thunder Bay on all railways. Further, the rates had become statutory, being as they were, and are, written into the Railway Act. This situation has continued to date.

Extension of the Statutory Rates

Until 1927 the Crow's Nest Pass Rates only applied to movement of grain and flour between points west of Thunder Bay and Thunder Bay. In 1927, consequent upon the opening of the Panama Canal and the establishment thereby of a cheap, all year water route from Western Canada to Europe and in response to lobbying by grain producers, a decision was taken by the Board of Railway Commissioners to establish a set of rates equivalent to the CNP rates for the transportation of grain and flour from prairie points to Vancouver and Prince Rupert for export. The rates so established, while not strictly speaking Crow Rates, were nevertheless equivalent to Crow Rates on a mileage basis so that, defacto, they too came to be known as Crow Rates.

In 1931, following the development of a railway from the prairies to the Port of Churchill on Hudson's Bay, a decision was made to establish "Crow" Rates for the transportation of grain and flour to Churchill for export. Thus, by the end of 1931, the term "Crow Rate" had come to

mean the rate applicable to all grain and flour moving from any point in the prairies to Thunder Bay; or to Vancouver, Prince Rupert and Churchill for export.

Oilseeds

During the 1950's growth in the markets for flaxseed in the Orient led to an application by the Vancouver Merchants Association for Crow Rates on flaxseed moving to export through Vancouver.[1] Not unnaturally, the railways were reluctant to accept this proposal. The Vancouver Merchants Association argued that flaxseed is a grain and, as such, should move at the (westbound) CNP rates established in 1927. The railway denied the argument. Consequently, a hearing on whether or not flaxseed was (or is) a grain took place before the Board of Railway Commissioners in 1956. The Board, after lengthy hearings, judged that flaxseed is a grain and ordered that the railways adjust their tariffs

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[1] Flaxseed was already included in the Crow Rates to Thunder Bay by virtue of it having been in the schedule to which the reductions were first applied in 1898.

for flaxseed moving to Pacific ports accordingly;[1] i.e. to rates of 1½¢ per 100 lbs. over the equivalent grain rate.[2]

During the late 1950's, rapeseed production expanded as markets developed for vegetable oils. Soon, an expanding volume of sales through west coast ports led to complaints of discrimination against rapeseed in the rate structure for oilseeds (flaxseed moving at CNP rates and rapeseed at higher rates). Accordingly, application was made by rapeseed producers to include rapeseed under the Crow Rates. The railways opposed the extension to rapeseed. This time Parliament, rather than the Board of Transportation Commissioners, made the decision. Implementation was by way of an amendment to the Railway Act in which rapeseed was defined as a grain for the purposes of

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[1] Canada. Board of Transportation Commissioners. Judgements, Orders and Rulings. Vol. XLVI. No. II, September 1, 1956. Order No. 89279: "Requiring the CNR and CPR to forthwith adjust their rates on flaxseed in accordance with direction contained in judgement dated July 23, 1956."

[2] It is interesting to note that, though the Board of Transportation Commissioners judged flaxseed to be a grain, they did not then apply (Crow) grain rates to it. Rather, they allowed the railways to develop, for the westbound traffic (and retain in the traffic to Thunder Bay), a 1½¢ per 100 lbs. differential over the equivalent grain rates. No explanation has either been offered or, apparently, sought.

the Crow's Nest Pass Rate section of the Railway Act.[1] Parliament thereby required that rapeseed move at the flaxseed rates to west coast ports for export. The amendment came into effect in August, 1961.

Consolidation and Protection of the Crow Rates

In 1967, the various decisions of the Board of Railway Commissioners relating to the conveying of export grain to Vancouver, Prince Rupert and Churchill at Crow Rates, were consolidated and written into the Railway Act by an amendment contained in the National Transportation Act of that year.[2] This amendment had the effect of making the westbound and Churchill rates statutory as well as those to Thunder Bay. Consequently, all Crow Rates are now statutory rates.

Further, Parliament acted, through the same amendment, to protect the Crow Rates from change. This was done by excluding the section of the Railway Act

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[1] An Act to Amend the Railway Act. Statutes of Canada. 9-10 Elizabeth II. Ch. 54. July 13, 1961.

[2] The National Transportation Act: Statutes of Canada 14-15-16. Elizabeth II. 1966/67. Ch. 69: Part V.S. 50. February 9, 1967.

containing the Crow Rate requirements from amendment by any other Act of Parliament except a direct amendment. In other words, it appears to have been the intention of the Government at that time to disassociate the Crow Rates from all previous acts and agreements of Parliament and any future acts or agreements which might be proposed.

Summary: History of Crow's Nest Pass Freight Rates

1897: Crow's Nest Pass Act passed. Crow's Nest Pass Agreement concluded.

1898: Freight rates for grain, flour and flaxseed reduced by 1½¢ per 100 lbs.

Rates for "settlers' effects" reduced (various percentages 10-33 1/3 percent).

1899: Rates for grain and flour (but not flaxseed) reduced a further 1½¢ per 100 lbs. Rates become known as the "Crow's Nest Pass (CNP) Freight Rates".

1901: Manitoba Agreement: CNR rates to Thunder Bay reduced.

1903: CPR freight rates reduced to CN levels. Rates now below CNP levels.

1918: Manitoba Agreement and CNP Agreement rates both suspended. Rates for grain and flour start to rise above the CNP levels.

1919: Railway Act rewritten and old Act repealed. Term of special Acts relating to railways (of which the CNP Act was one) limited to three years from 1919.

1922: Railway Act amended to override the 1919 provisions relating to special Acts. Extension of the exemption of special Acts continued for two more years but Crow Rates for grain and flour restored and made statutory.

1924: CNP rates restored on settlers' effects. Supreme Court case over the number of shipping points.

1925: Railway Act amended to extend CNP rates on grain and flour to all shipping points on all railways in the West. Special rates on settlers' effects discontinued.

1927: CNP rates established for grain and flour moving to Pacific Coast ports for export. Incremental allowances for branch lines discontinued.

1931: CNP rates established for grain and flour moving to Churchill for export.

1956: Flaxseed to Vancouver and Prince Rupert for export, added to list of goods to be carried at the Crow Rates.

1961: Rapeseed defined as a grain and thereby eligible for CNP (flaxseed) rates.

1967: Westbound and Churchill rates made statutory by passage of the National Transportation Act. Requirement of a direct amendment to the Railway Act added to protect CNP rates.

The pattern of change in prairie grain freight rates from 1897 to 1976 is reflected in Table 2 below.

Table 2:

Historical Pattern of Grain Freight Rates In The Prairies 1897-1976 (as reflected in the rates for Regina, Saskatchewan to Thunder Bay, Ontario)

Period	Rate	Basis
	(cents per 100 lbs.)	
1897	23	Value of Service
1898	21½	Crow (Agreed Rate)
1899-1902	20	Crow (Agreed Rate)
1903-1917	18	Competitive
1918-1921	24	Compensatory
1922-1976	20	Crow (Statutory Rate)

THE CROW'S NEST PASS RATES IN 1976

There is, in fact, no one Crow Rate. There is a Crow Rate for each of over 1,600 shipping points to each of four destinations. There are, thus, over 6,000 Crow Rates. These rates fill six fairly substantial volumes of railway tariffs and are not reproduced in this report. A sample of these rates is presented in Table 3.

Commodities and Routes

The Crow's Nest Pass Freight Rates now apply to grain and flour, flaxseed and flaxseed products, rapeseed and rapeseed products and a number of grain and oilseed related products.[1]

Crow Rates apply on four major railway routes. These are (from prairie shipping points) to Thunder Bay, Vancouver, Prince Rupert and Churchill. This pattern is illustrated in Figure 1. Crow Rates to Vancouver, Prince Rupert and Churchill apply only to grains going to export.

The Crow Rate Schedule

The Crow Rate schedule was originally, as still is, related to distance. Figure 2 shows the relationship. The schedule is approximately linear, and has two segments:

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[1] For greater detail on the commodities covered readers are referred to the railway tariff schedules. A sample of the commodity listing for one such tariff is presented in Appendix B.

Table 3:

Crow's Nest Pass Freight Rates, 1976

Commodity and Shipping Point	Rate to Thunder Bay[1]	Vancouver[2]	Prince Rupert[2]	Churchill[3]
	For Export only			
	(Cents/100 lbs.)			
GRAIN AND GRAIN PRODUCTS				
British Columbia				
- Dawson Creek	38[d] (25[a]	30[b]	26[c])	36
- Fort St. John	43[d]	25		
Alberta				
- Calgary	26	20	20	26
- Edmonton	26	20	20	25
- Grande Prairie*	35½	28	28	
- Lethbridge*	25	22	22	
- Three Hills	27	21	21	26
- Vulcan	26	21	21	
Saskatchewan				
- Saskatoon*	22	24	24	21
- Regina	20	26	26	22
- Carrot River	23	27	27	20
- North Battleford*	23	24	24	
- Rosetown	23	25	25	22
- Shaunavon	23	24	24	
- Swift Current*	22	24	24	
- Veregin	19	29	29	19
Manitoba				
- Winnipeg	14	34	34	23
- Altona*	15	24	24	
- Dauphin*	18	29	29	21
- Killarney	16	33	33	
- Portage La Prairie	15	33	33	22
FLAXSEED AND RAPESEED				

All rates 1½¢ per 100 lbs. higher than grain products rates for the same distance[4], e.g. Calgary to Thunder Bay: 27½¢ per 100 lbs.

For footnotes see following page

Footnotes - Table 3:

[1] CNR Tariff Schedule W-183F; CPR Tariff Schedule W-425A

[2] CNR Tariff Schedule W-135I; CPR Tariff Schedule W-430A and BCR Tariff Schedule 475

[3] CNR Tariff Schedule W-485D

[4] Except Fort St. John (for which the differential is 2¢ per 100 lbs.)

[a] BCR rate

[b] NAR/CPR route via Alberta

[c] Special (Commodity) Rate for NAR, Grande Prairie, ARA, CNR route to Vancouver via Alberta

[d] Combination rate: BCR to Dawson Creek, 5¢; plus NAR/CNR rate to Thunder Bay, 38¢

Shipping points selected for this table on following basis:

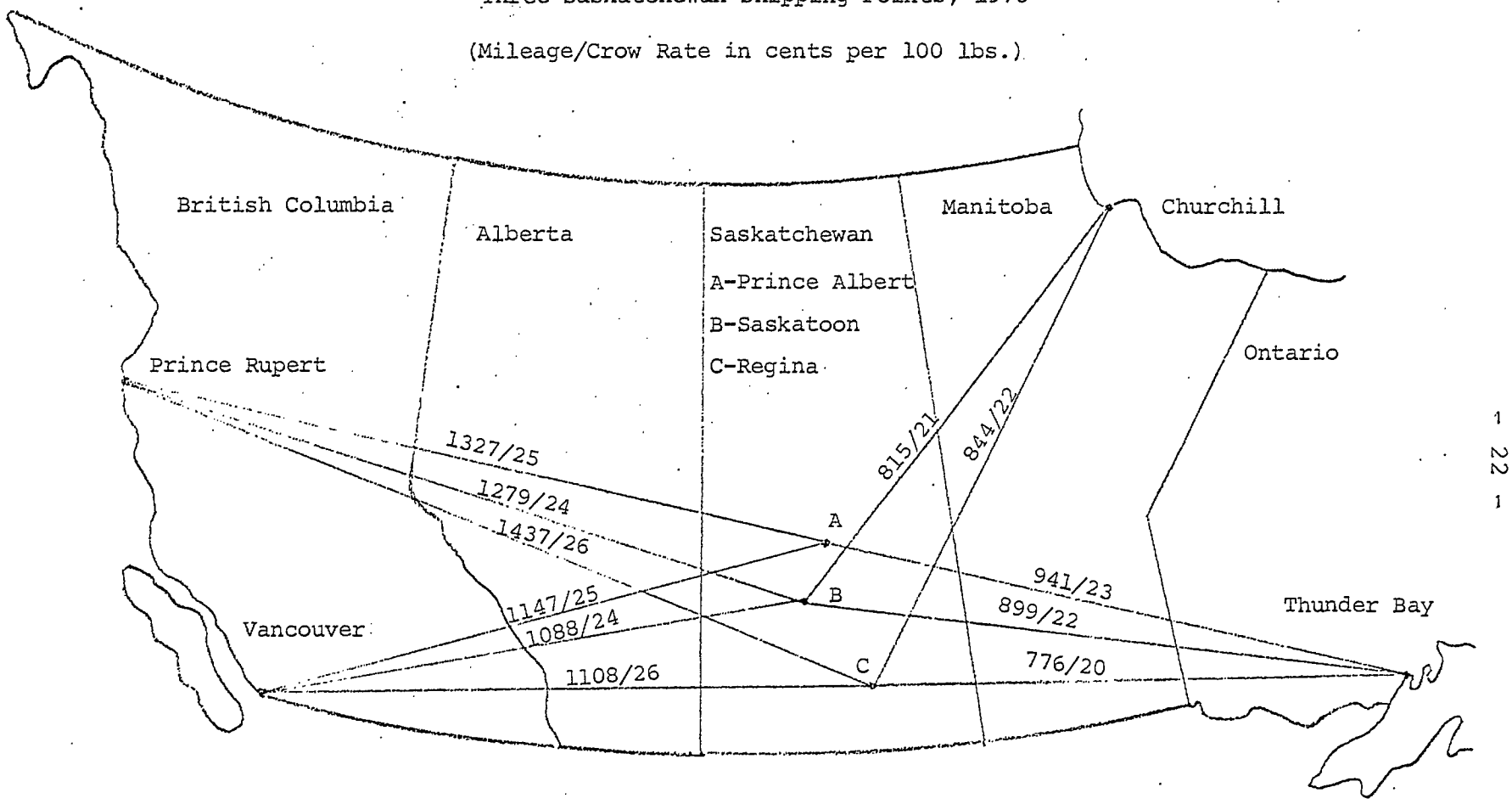
- Major cities because they are known; some other points because of the high volumes of grain handled (as represented by the number of primary elevators of capacity greater than 100,000 bushels) as reported in "Grain Elevators in Canada, Crop Year 1975/76". Canadian Grain Commission, Winnipeg, 1975. Published by Information Canada and sold through Canadian Government bookstores.

- Starred (*) points because, in the opinion of a committee of DREE Analysis and Development officers, these points lie in the trade-off zone where a change in the net returns of grain and oilseeds relative to livestock production is likely to cause a significant change in primary production patterns.

Figure 1

"Crow Rate" Routes, Distances and Rates From
Three Saskatchewan Shipping Points, 1976

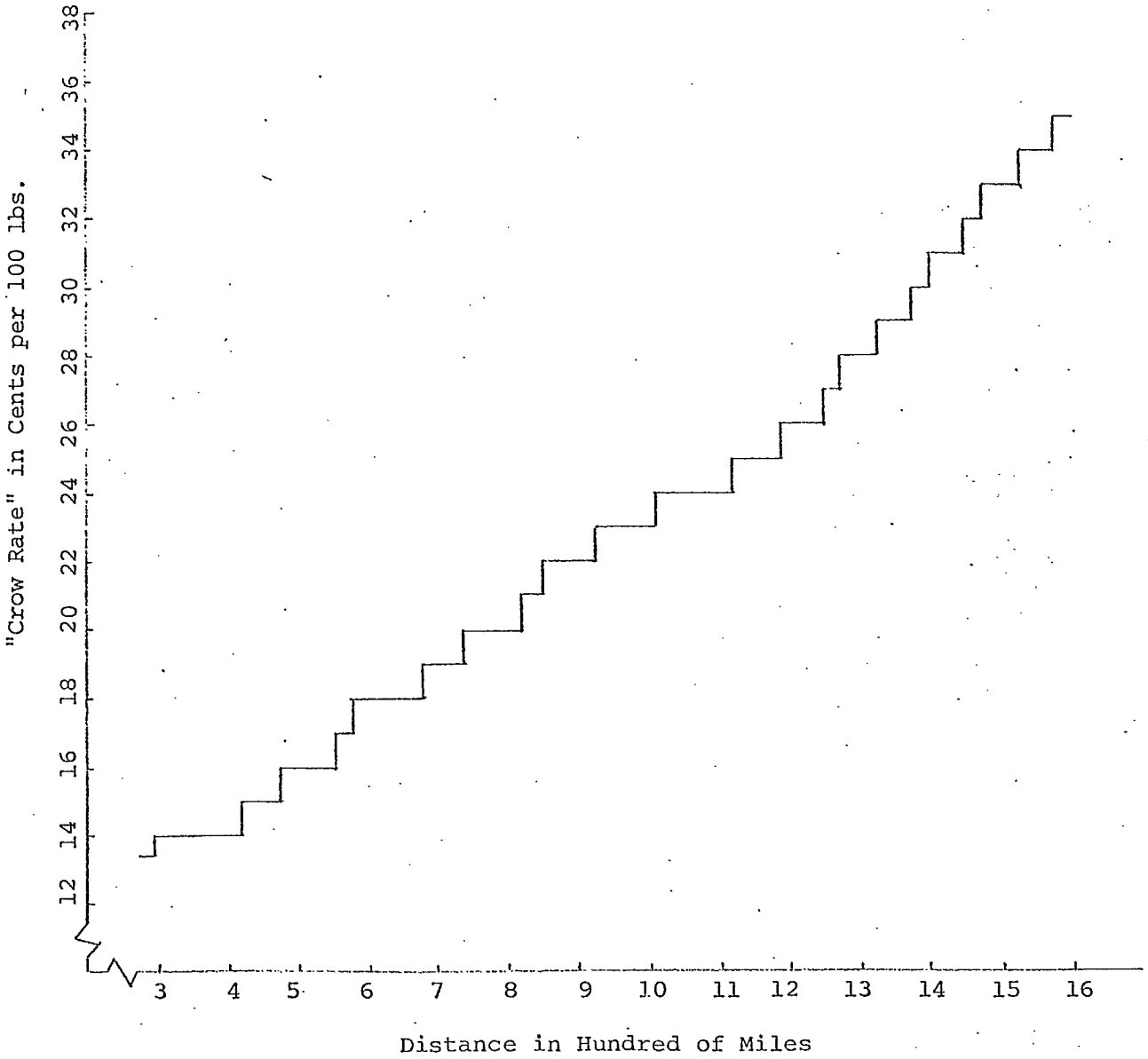
(Mileage/Crow Rate in cents per 100 lbs.)



This figure is based on a concept presented by D. Grant Devine and Surenda N. Kulshreshtha in "A Historical Review of the Crow's Nest Debate". Saskatoon, Saskatchewan. University of Saskatchewan. Transportation Centre. March, 1976.

Figure 2:

The "Crow Rate" as a Function of Distance[1]



[1] Data from Appendix C

one for distances up to 1,284 miles and one for distances of more than 1,284 miles. For the shorter distances, an equation of the schedule has been deduced by fitting a linear function to the midpoints of the schedule illustrated in Figure 2[a]. For distances over 1,284 miles, the equation of the schedule was directly available from historical records.[1] The following equations accordingly describe the current Crow Rate schedule.

For distances up to and including 1,284 miles -

$$Y = 8.71 + 0.01435\ X_1 \qquad (1a)$$

for distances greater than 1,284 miles -

$$Y = 28 + 0.0218\ X_2 \qquad (1b)$$

where:

Y = Crow Rate in cents per 100 lbs.
X_1 = Distance in miles ($\leq$ 1,284)
X_2 = Distance in miles over 1,284

These equations are used in the analysis which follows.

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[a] Data for the Crow Rate Schedule is presented in Appendix C.

[1] For source, see Appendix C, Footnote 1.

MARKET RATES

In this chapter, the concept of a market rate as a replacement for the Crow's Nest Pass Freight Rates is developed. Theoretical considerations are presented first. These are followed by a discussion of rate making in practice. Freight rates comparable to Crow Rates have been assembled and are presented. A market rate schedule which might be considered as a substitute for the Crow's Nest Pass Freight Rates is derived and presented.

The Concept of a Market Rate

In order to evaluate the benefits and costs of the Crow's Nest Pass Freight Rates, it is first necessary to establish a set of rates which would apply in the absence of Crow Rates. The concept of an economic rate or a market rate for the railway services is used.

Market rates have the desirable properties of allocating resources efficiently and obtaining the required service for the lowest possible cost. The concept is a general one and needs to be evaluated in light of the market conditions for railway services to which it is to be applied.

Theory

A review of the theory of markets and the formulation

of market prices and rates of exchange for the provision of goods and services shows that there are several conditions which must be met in order for a market price or rate of exchange to be established. These are collectively known as the requirements for perfect competition. Specifically, the requirements are that: there be many buyers and sellers in the marketplace; the goods or services being exchanged shall be homogeneous; there is perfect knowledge on the part of both buyers and sellers; there is freedom of entry and exit from the marketplace; and, the parties conduct themselves in a profit maximizing manner. Any price or rate of exchange established for the transaction of goods or services under these conditions is genuinely a market rate. However, should any of these requirements be violated or fail to be satisfied, then the existence of market rates becomes less distinct. Accordingly, we now examine the market for railway services to see which of the conditions of perfect competition are met and which are not. We look first at the requirement for many buyers and sellers.

In the prairie area, to which the Crow's Nest Pass Freight Rates apply, we observe that there are only two major railways and, in total, only five suppliers of railway

services.[1] Obviously then, the requirement for many sellers is weak. On the other side of the market, the condition requiring many buyers is probably reasonably well satisfied. The buyers of railway services for Crow's Nest Pass commodities are primarily grain producers and there are indeed a great number of these in the prairie area.

Secondly, we need a homogeneous product. This condition is also probably reasonably well met within the broad categories of grain and oilseeds.

Thirdly, there is the question of perfect knowledge. Obviously no one has perfect knowledge and it can be argued to the extent that farmers are somewhat isolated in their rural circumstances, they may not have at their disposal full information in regard to the alternatives for freighting their grains to market. However, this is not judged to be serious in the present context. On the other hand, the major railways (at least) are highly integrated and therefore, within these companies, information can move freely across a wide area. Between railways, the flow of information may not be so free but customers are likely to bring discrepancies between

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[1] Canadian Pacific Railway, Canadian National Railway, Northern Alberta Railway, Alberta Resources Railway and the British Columbia Railway.

railways to their attention quickly. The question of level of knowledge is, therefore, judged as not constraining to the formation of market rates for grains.

On the question of freedom of entry and exit from the market for railway services we have a clear case of the requirements of competition not being met. Railways require massive funding to establish the initial road bed, terminals, switching yards and rolling stock. This is not something which many individual firms have the capacity to undertake and, in a historical context, at least in Canada, not an assignment which many firms have found they can undertake without direct and fairly substantial involvement of government funds and support (of which the Crow's Nest Agreement is but one example). Equally, the question of freedom of exit from the provision of railway services is similarly restricted. In this case, it is not that established railways cannot cease to provide services by their own choice, but rather that they are extensively constrained by legislation in this regard. Thus, the supply side of the market for railway services and the requirements of freedom of entry and exit are largely denied.

The situation may be a little better on the buyers' side of the market, i.e. the farmers' side where, to a

certain extent, the possibility of refusing to pay the established railway charges does exist if truck and water transportation are alternatives. However, the lack of water transportation alternatives affects most farmers in the prairies. Further, the currently low level of Crow Rates for grain moving by rail tends to suggest entry, rather than exit, by farmers from the market for railway services. At a higher set of prices for railway services there may well be some trade-offs between road and rail modes by farmers. Overall, there does not appear to be any major problem associated with entry and exit on the buyers' side of the market for railway services.

Finally, there is the condition of profit maximizing behaviour. There seems to be little reason to doubt the existence of this type of behaviour on the part of the non-government railways and the grain producers. The conduct of the government-owned railways on this point may be moot, but at least initially, we assume this condition exists for these railways, too.

An examination of the nature of the market for railway services has shown that the concept of a market rate, while a desirable one, is in fact going to be a little difficult to implement due to the failure in reality of

the market for railway services to meet certain requirements. In these circumstances we find certain pragmatic solutions appearing. These are the subject of the next section.

Rate Making in Practice

Under the circumstances described above, we find the pattern of freight rate establishment has taken a fairly predictable course. First, the railways establish rates according to what they call value of service. This is followed by a reaction on the part of buyers who, because of their small individual size and geographical disbursement across the prairies, lack equal economic power. They enlist the support of governments who then make arrangements (such as the Crow's Nest Pass Agreement) establishing limits on the freight rates which are acceptable. Over time, as the process continues, governments come to regulate the freight rate structure more and more closely. In the extreme we find rates being established and regulated by statute.

In between the value of service and statutory regulation of rates, there are a number of recognizable intermediate points. Each of these relates to a stage in the rate development process and bears a name which reflects

this. For the purposes of this report, four intermediate rate bases are identified. They are:

(a) cost of service;
(b) meeting the competition;
(c) negotiated rates; and,
(d) regulated rates.

In total then we have six practical rate-making bases.

An examination of each of these alternatives is useful to the understanding of the establishment of new rates for CNP commodities. Each alternative represents one aspect of the market in a practical sense, and each can find its theoretical antecedent in the material discussed under "Theory" above. First, the value of service.

Value of Service

Given a situation which is fairly free (in the sense of being open and unregulated) this alternative is clearly that which suits the railways best. It allows them to charge "what the traffic will bear". Given their monopoly or their oligopoly position, pricing in this manner leads the railways most easily to their profit maximizing position. However, given the essentially exploitive nature of this type of pricing under oligopoly conditions, such rates

seldom last beyond the time that it takes for the purchasers of railway services to become organized and to present a countervailing influence. Thus, we find that this principle can only be invoked effectively where new railways are being built and land is being settled for the first time.

Cost of Service

At the other end of the scale, the minimum condition which the railways seek to establish is that where they are compensated for at least in the amount of their costs incurred in providing the service. On the face of it, this is a reasonable alternative. However, in the railway context, certain difficulties can and are encountered in this approach to rate making. First, there is the question of what the actual costs of providing any given railway service are. In fact only the railways know and it is probably a moot point as to whether or not they know, with any degree of precision, the exact cost of moving any one commodity between any two given points on their railway system. It seems likely that, unless there has been some other reason for the railway to calculate such costs, the calculations won't have been made and, therefore, the costs are unknown. Further, should the railways attempt to cost out the movement of each commodity across each route, they will inevitably be faced with the problem of allocating

a very large overhead cost to individual routes and commodities. There are no unimpeachable methods for doing this. Thus, should the railways wish to establish new rates at higher than existing levels, it seems likely that they will calculate their costs in a manner likely to be favourable to the outcome which they seek.

Secondly, there is the question of whether one should take historic costs or anticipated future costs as a basis for rate making by this method. Historic costs have the benefit that they have, in fact, been incurred and can thus be established with a reasonable degree of accuracy. However, whether this historic information is of value in formulating rates depends on the conditions that are anticipated for the period of their application. Several other factors then become important. These are: the likely demand for the service; any changes in railway technology (such as the introduction of hopper cars to replace box cars); and, the rate of inflation (or depreciation) in the value of money. Further, the railways themselves must bear some responsibility for risk involved in anticipating the future. For example, railway users should not be expected to pay for railway management decisions which result in the purchase of excessive amounts of capital goods (rolling stock and railway track). The current existence of a specific

capital stock of railway equipment is not, for example, necessarily a sufficient condition for setting rates at levels which will fully compensate the company for the costs incurred in operating and maintaining that equipment in the future.

Anticipated levels of costs are another base which can be used in the establishment of rates. These costs represent budget expectations related to anticipated future conditions. As such, these estimates better provide for the future than do historic costs, particularly in inflationary times. However, in drawing up the necessary budgets it is often necessary to assume certain conditions with regard to the prices of the goods and services to be handled. Later, if the circumstances of these budgets change, the anticipated costs will not, in fact, be incurred and thus the information which was used originally for price setting is, in the event, erroneous. Thus, this principle, too has its shortcomings.

Meeting the Competition

Where competition exists, either between two railways or between railways and other modes of transportation, the principle of meeting the competition provides a useful basis for rate making. In these circumstances the problems of value of service pricing are largely dissolved by the introduction of competition.

Places where this type of pricing mechanism can be implemented are the so-called competitiye points on the railway systems, that is, where the railway tracks of different railroads cross each other, and where there is competition from trucks or ships for the carriage of grains and oilseeds. Obviously, water transportation is largely irrevelant to the prairie situation and that from trucks is considered only applicable over relatively short distances, at least this is thought to be the situation so long as railway freight rates are held at the Crow's Nest Pass levels.

Agreed Charges

It is sometimes possible for the shippers and the railways to come to an agreement over the rates to be charged for the transportation of certain commodities. In railway terminology, these rates are called "agreed charges". Under this type of rate making, the agreement between the parties usually specifies the type of commodity to be moved, the freight rate, the minimum volume of the commodity to be committed to the railway signing the agreement and the duration of the agreement. Generally, there is some trade off between rate and volume carried. One example of such an

agreement was that which existed, until recently, for the transportation of millfeeds from Alberta to British Columbia.[1]

Regulated Rates

Where charges cannot be established to the satisfaction of both parties by agreement, some form of arbitration is frequently necessary. Formal procedures for such arbitration exist in the form of references to the Canadian Transport Commission. Upon request, the CTC may hold hearings and adjudicate a rate. Over time, the CTC has established certain rules and regulations under which such arbitration will proceed and the parties must now conform to these regulations both in their applications and with respect to the rates established by a decision of the CTC.

Statutory Rates

Periodically, the magnitude of the decision involved in regulating freight rates is so great as to be beyond the formal procedures of the Canadian Transport Commission or any other government body or arbiter. In these circumstances, the matters are referred to the Parliament of Canada

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[1] For details, see Table 4, following Ref. 3.

for adjudication. Where possible, Cabinet decisions and orders are used. Where this is not feasible, legislation is used. The Crow's Nest Pass Freight Rates have obviously been in this latter category, at least since 1925.

Market Rates for Crow Rate Commodities

Against the background presented above it is quite clear that the establishment of a set of rates to replace the Crow's Nest Pass Rates is going to be a very complicated and, probably, protracted process. It would likely involve all the considerations presented above and a good number of political considerations as well. Nevertheless, for the purposes of this study it has been necessary to establish some alternate freight rate in order to estimate the significance of Crow Rates to Western Canada. Accordingly, we now turn to the consideration of a likely market rate alternative to the Crow Rates.

In this regard, an attempt has been made to assemble as much information as possible (in the time available) regarding railway freight rates which are applicable to conditions similar to those to which Crow Rates apply. In the process, some data related to the cost of service, some to competitive rates (both within Canada and internationally), some agreed charges and some regulated

rates have been assembled for comparison to the statutory Crow Rates. Where possible complete schedules have been obtained.[1]

Data for these freight rates is presented in Table 4 and Figure 3. The information contained in Table 4 is for rates between specific points.

In addition to this information, there was available from North Dakota, some rate schedule information expressed in the form of equations relating rates for grain movements by rail from North Dakota points to Duluth and Seattle.[2] This information is contained in Appendix D and is shown in graph form, (along with the point to point data from Table 4) in Figure 3. Also contained in Figure 3 is a plot of the New South Wales, Australia railway freight rate schedule for wheat. All of the information appearing in Figure 3 has been used in establishing a "market" rate for this study.

The author's estimate of the average of all these rates is indicated by the dotted line in Figure 3. This

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[1] In some cases this material can be presented in the form of equations relating rates to distance. In other cases point estimates only have been available.

[2] The author is grateful to Dr. Robert J. Tosterud of the Upper Great Plains Transportation Institute in Fargo, North Dakota for supplying this information.

Table 4:

Crow and Comparable Freight Rates

Country	Data for Year	Ref.	Commodity	Rate Basis	Origin	Destination	Miles	Rate (cents/100 lbs.)
CANADA	1976	1*	Grain	Crow	Regina	Thunder Bay	776	20
			Grain for export	Crow	Calgary	Vancouver	766[a]*	20
					Edmonton	Vancouver	766	20
		2	Grain for export	Cost of service (railways)			850[b]	91
		3	Grain products	Agreed charge	Calgary	Vancouver	650	58
					Edmonton	Vancouver	765	63
		4	Grain, feed	Truck competitive	Calgary	Vancouver	650	85
					Edmonton	Vancouver	765	96
		5	Grain	Mileage	Calgary	Vancouver	650	186
					Edmonton	Vancouver	765	205

* For references and footnotes, see page following the end of the table.

Table 4: continued

Country	Data for Year	Ref.	Commodity	Rate Basis	Origin	Destination	Miles	Rate (cents/100 lbs.)
UNITED STATES OF AMERICA	1975	6	Grain for export		Bisbee, N.D.	Duluth	418	64 (U.S. FUNDS)
		7	"		Wolf Point, Montana	Duluth	710	117
		8	"		"	Houston	930	91[c]
		6	"		"	Seattle	1050	146
AUSTRALIA	1976	9	Wheat		Coona-barabran	Newcastle	210	68 (CAN. FUNDS)
					Temora	Sydney	250	73
							850	102

Table 4:

References and Footnotes

1 - From Table 3.

2 - Derived from data presented in "Railways Claim Big Losses on Grain", Vancouver Sun, Vancouver, British Columbia, April 20, 1976 in which the CP and CN Railways claim the amount of 52¢ per bushel as the cost of hauling export grain. This per bushel figure converted to a rate per hundredweight by using the figure of 56.9 lbs. as the average weight of an export bushel.

3 - Agreed Charge #1589: CP, CN, B.C. Hydro and Robin Hood Flour, et al. Grain products excluding mixed feeds in 100,000 lb. carload lots.

4 - CN Tariff W-184E, S.2 Truck competitive rates for feed grains in 120,000 lb. carload lots.

5 - CP Tariff W-420B, S.3.

6 - Austin, Lynn A. "Controversy Flares Over Canada's Grain 'Crow Rate'". In Foreign Agriculture, Washington, D.C., United States Department of Agriculture, Foreign Agriculture Service, December 15, 1975.

7 - Kulshreshtha, S.N. "A Current Perspective on the Prairie Grain Handling and Transportation System", Saskatoon, Saskatchewan, University of Saskatchewan, Department of Agricultural Economics, September, 1975. Table XIV.

8 - Transport Canada, Grain Transportation Branch, Canadian Surface Transportation Administration. "The Short Line Concept, An Answer to the Prairie Branch Line Problem?". Report #75-4, October, 1975, p. 23.

9 - Public Transportation Commission of New South Wales. Rail Division, Sydney, Australia. "Merchandise and Livestock Rates: Vol. 1, July, 1973" as amended by Circular No. 164, October 19, 1975 and Circular 164A, November 12, 1975. Rates for wagonload lots. Rates converted to Canadian dollars at the rate of $A1.00 = $C1.19.

Table 4:

Reference and Footnotes, continued

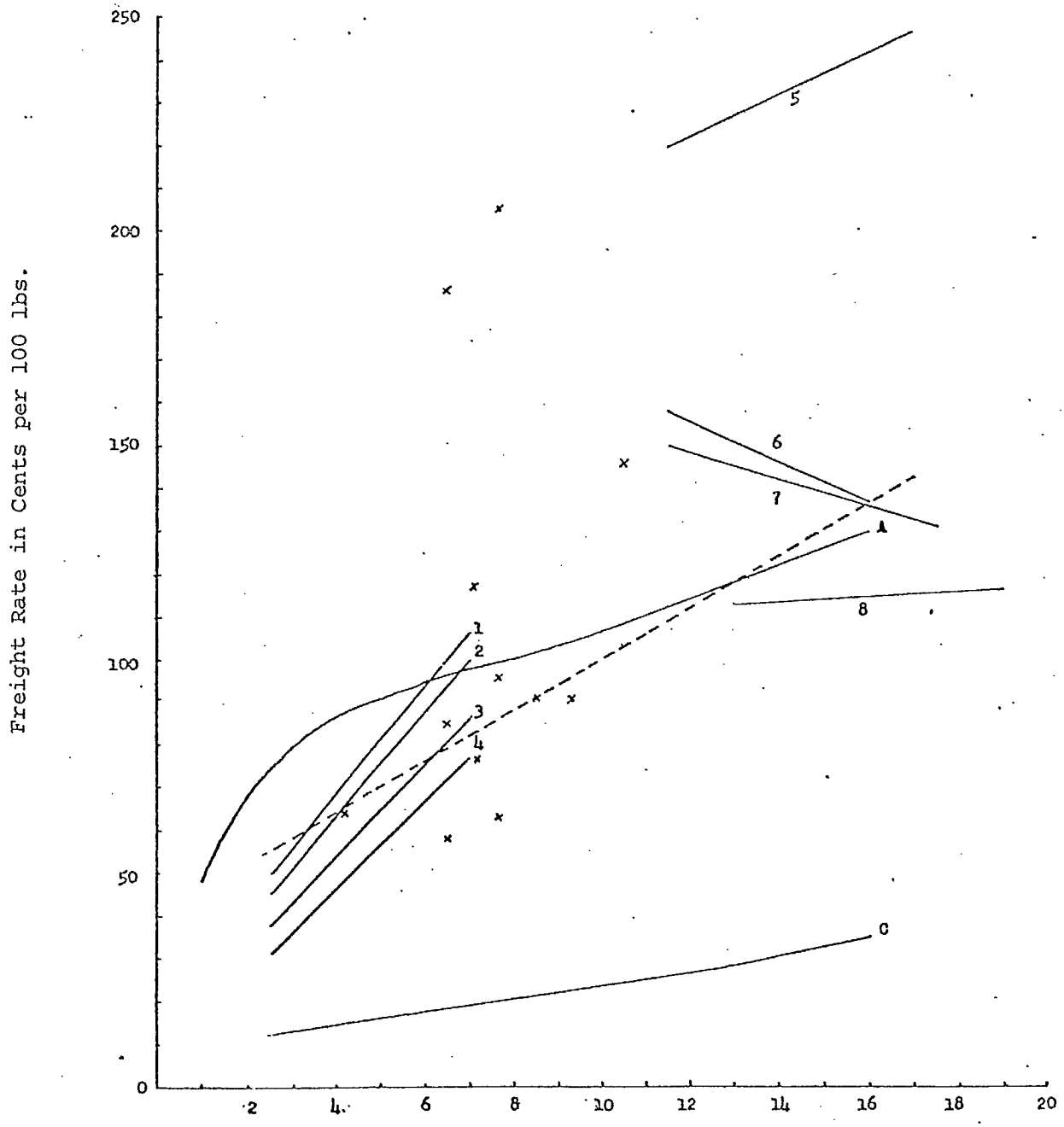
a - Constructive mileage (used to allow for steeper grades on the CP route, Calgary to Vancouver versus CN route, Edmonton to Vancouver) not actual mileage.

b - Estimate.

c - Reflects water competition on the Mississippi River.

Figure 3:

"Crow" and Comparable Freight Rates



(Explanatory Code: Next Page)

Explanatory Code, Figure 3

x	–	Points from Table 4
1-8	–	Equations from Appendix D
A	–	New South Wales, Australia grain schedule (see footnote 9, Table 4)
C	–	The "Crow Rate" schedule (Equations 1(a) and 1(b)) in the script
---	–	Author's estimate of average of non-Crow rates (see page 38)

line has the equation;

$$Y = 40 + 0.06 X \quad (2)$$

where Y = the freight rate in cents per 100 lbs.

and X = the distance in miles between shipping point and terminal destination.

This line and equation presents an average price at each shipping point without regard to volume shipped. Generally, rates can be reduced as the volume shipped increases. In the case of Crow Rate, the volume of grains shipped from the prairie area is much greater than either that shipped from North Dakota or New South Wales in Australia and is certainly much greater than the amounts shipped under the other Canadian rates in Appendix 4. Accordingly, a downward adjustment of the rate schedule represented by Equation 2 is in order.

The amount of this reduction which is appropriate for Crow Rate grains is not immediately obvious. However, an amount somewhere between 10-20 percent is probably appropriate. For the purposes of this study a reduction for volume of 15 percent is assumed.

When this reduction is applied to Equation 2, Equation 3 results:

$$Y = 34 + 0.051 X \quad (3)$$

where Y = the rate in cents per 100 lbs.

and X = the distance from shipping point to terminal destination.

Equation 3 has been taken to be the equation of the schedule of rates which might replace the Crow Rates, if a market rate structure were to be adopted.

Using Equation 3, new rates for the transportation of grain and oilseeds by rail from the points listed in Table 3 to Thunder Bay or Vancouver, whichever is shorter[1], have been calculated. In each case it is assumed that the actual mileage on the route used is the relevant parameter to use in rate making. Constructive mileages, which have been used in the past for establishing the rates applicable for Calgary to Vancouver and Winnipeg to Thunder Bay, have been ignored. The new rates are shown in Table 5. This table shows the route, railway, distance and new "market" rate.

Table 5 and Table 3 are directly comparable. A comparison has been made and presented in Table 6. The differences in cents per 100 lbs. between Crow Rates and the new market rates are noted. A comparison is also made by measuring the ratio of the new rate to the old rate.

The new rates for the points contained in Table 5 range in value from 55¢ to 93¢ per 100 lbs. These rates

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[1] This is consistent with current Wheat Board policy of charging shippers for the shorter of these two distances, irrespective of the route which the grain actually travels.

compare to 14¢ and 28¢ per 100 lbs., respectively in the Crow schedule. On a ratio basis, the new rates vary between 2.8 and 4.0 times Crow Rates.

These rates are now used to measure the significance of Crow Rates to western Canadian agriculture.

Table 5:

Estimated Market Rates For Grain Flour
Flaxseed and Rapeseed

Shipping Point	Railway	Distance to Thunder Bay	Distance to Vancouver	Market Rate[2]
		(Miles)[1]		(cents/100 lbs.)
British Columbia				
- Dawson Creek	BCR		728	71
- Fort St. John	"		736	72
Alberta				
- Calgary	CP		650	67
- Edmonton	CN		765	73
- Grande Prairie	NAR/CN		1,162[a]	93
- Lethbridge	CP		768	73
- Three Hills	CN		921[a]	81
- Vulcan	CP		710	70
Saskatchewan				
- Saskatoon	CN	899		80
- Regina	CP	776		74
- Carrot River	CN	916		81
- North Battleford	CN/CP	1,000		85
- Rosetown	CN/CP	973		84
- Shaunavon	CP	964		83
- Swift Current	CP	929		81
- Veregin	CN	705		70
Manitoba				
- Winnipeg	CP/CN	420		55
- Altona	CP	482		59
- Dauphin	CN	610		65
- Killarney	CP	583		64
- Portage La Prairie	CP	475		58

[1] From Tariffs CP W.1600, CN W.100D, BCR 525, NAR 43.

[2] Basis: Equation 3.

[a] Via Edmonton

Table 6:

Comparisons of Crow and Estimated Market Rates

Shipping Point	Crow Rate[1] (cents/ 100 lbs.)	Market Rate[2] (cents/ 100 lbs.)	Difference	Ratio Market/ Crow
British Columbia				
- Dawson Creek	25	71	46	2.8
- Fort St. John	25	72	47	2.9
Alberta				
- Calgary	20	67	47	3.4
- Edmonton	20	73	53	3.7
- Grande Prairie	28	93	65	3.3
- Lethbridge	22	73	51	3.3
- Three Hills	21	81	60	3.9
- Vulcan	21	70	49	3.3
Saskatchewan				
- Saskatoon	22	80	58	3.6
- Regina	20	74	54	3.7
- Carrot River	23	81	58	3.5
- North Battleford	23	85	62	3.7
- Rosetown	23	84	61	3.7
- Shaunavon	23	83	60	3.6
- Swift Current	22	81	59	3.7
- Veregin	19	70	51	3.7
Manitoba				
- Winnipeg	14	55	41	3.9
- Altona	15	59	44	3.9
- Dauphin	18	65	47	3.6
- Killarney	16	64	48	4.0
- Portage La Prairie	15	58	43	3.9

[1] From Table 3

[2] From Table 5

THE SIGNIFICANCE OF CROW RATES TO WESTERN CANADIAN AGRICULTURE

An evaluation of the significance of the Crow Rates to Western Canadian agricultural production and processing can now be made. To do this it is assumed that Crow Rates are abolished and the new rate structure, derived above, is substituted. When this is done, a number of effects are observed.

The main effects appear in grain production and revenues, export grain carried by railways and their revenues therefrom, and in changes in feed grain use and livestock production. Other areas such as grain handling and the transportation of feed grains and meat are also affected. There is also a transfer of livestock production from east to west within Canada and certain regional and local area effects are being observed within the prairie area as well. Each of these effects has been examined and estimates of the magnitude of the changes involved have been made. Details of the estimates follow.

Grain Sector

The effects of an increase in the freight rates for export grain are most noticeable in the market for export grains. However, there are side effects and adjustments in

the market for feed grains and the total supply of grain as well. The situation is represented diagrammatically in Figure 4.

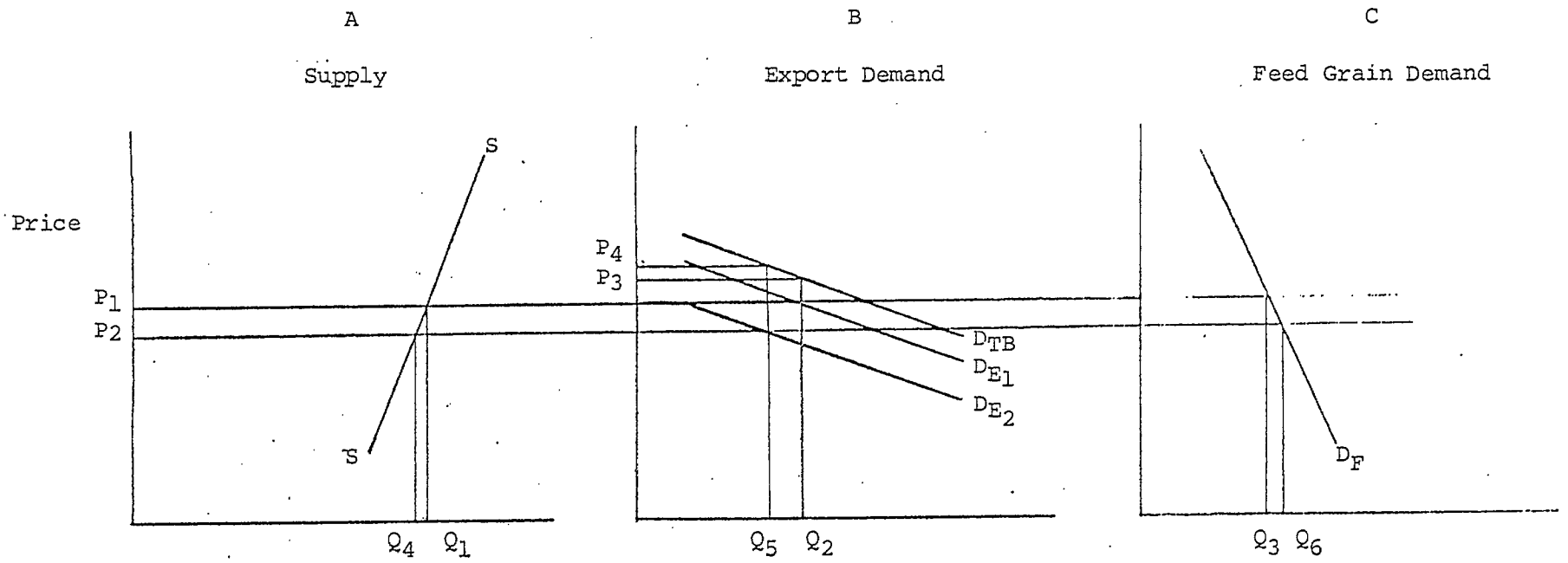
Figure 4 has been prepared so as to represent each of the three parts of the market for grain separately and to show their interaction. Part A of Figure 4 relates to the production of grain. SS in this part of the figure illustrates the response in supplies of grain to price. Part B of the figure represents the export market for grain. D_{TB} is the demand for grains at Thunder Bay (or Vancouver), D_{E_1} represents this demand at the farm gate in the prairies. The vertical distance between D_{TB} and D_{E_1} represents the Crow Rate. The demand for feed grains in the prairies is represented in Part C of the figure. D_F shows the response of the feed market to changes in price.

An initial equilibrium price under Crow Rates is represented by P_1. Q_1 is the quantity produced at this price, Q_2 is the quantity exported and Q_3 the quantity used for feed.

An increase in the freight rates for export grains results in lower farm gate prices for this type of grain. This change is represented by the movement of D_{E_1} to D_{E_2}, in Figure 4, Part B. The vertical distance between D_{E_2} and D_{E_1} represents the amount of the increase in freight rates. A

Figure 4:

The Supply and Demands for Grain and the Effects of an Increase in Export Grain Freight Rates Upon Prices and Quantities Supplied and Demanded



disequilibrium is created by this change. Equilibrium is restored by 1) a reduction in production, and 2) a shift of product from the export market to the feed grain market. A new equilibrium is established at farm price levels P_2 with the quantity produced being Q_4. Exports contract to Q_5; feed use expands to Q_6. Prices at Thunder Bay rise from P_3 to P_4.

Given data for production, market shares (export and feed) demand and supply elasticities, estimates of the changes in the prices (P_1 through P_4) and quantities (Q_1 through Q_6) can be made for any given change in freight rates.

The effects of a change from the old (Crow) Rates to the new (market) rates for the prairies as a whole have been evaluated by assuming that all grain moves through one central point and that the model described above applies.

Analysis of data for 1974 shows that the central point to which all grain deliveries may be presumed to have been made is 850 miles from Thunder Bay (or Vancouver). The Crow Rate for this distance is 21¢ per 100 lbs. The new rate for this distance is 77¢ per 100 lbs. These two rates establish the change in freight rates for application to the model of Figure 4.

The remaining data for this model was assembled as follows: For production: 10 year average acreages and yields.

For market shares: estimates derived from 10 year average disposition records. For prices: five year average prices at Thunder Bay less Canadian Wheat Board marketing and handling charges. All data was taken from the Canadian Grains Council Statistical Handbook for 1976[a]. Data for the demand and supply elasticities were taken from studies published by Kulshreshtha and others.[1]

The effects of a change in freight rates on six grains and two oilseeds have been examined. The grains studied were wheat, oats, barley, mixed grains, rye and buckwheat. The oilseeds studied were flaxseed and rapeseed.

The effects a new average freight rate of 77¢ per 100 lbs., replacing a Crow Rate of 21¢ per 100 lbs. have been computed using the model of Figure 4. The findings for the prairie region as a whole are as follows.

Grain production and land used for grain are reduced by 5.1 percent. Details of the changes are noted in Table 7.

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[a] Canadian Grain Council: "Canadian Grains Industry Statistical Handbook 1976". Winnipeg, Manitoba, 1976.

[1] See Appendices E and F.

Table 7:

Estimates of the Effects on Production, Land Used and Gross Revenues from Grain Produced by a Change in Rates from an Average 21 cents per 100 lbs. to 77 cents per 100 lbs. in the Prairie Region

Item	Unit	Current Levels	After Change	Change Amount	Change Percent
Production	M. ton	33.3	31.6	-1.7	-5.1
Land Used	M. acres	44.8	42.5	-2.3	-5.1
Revenues	M. $	2674.6	2355.0	-319.6	-12.0

Gross revenues from grain also decline. The amount of the decline is estimated at $319.6 million or 12 percent. This decline in revenues is due to both lower prices for all grains (P_2 in the model) and a reduction in the amount of grain grown.

As noted earlier most of the effects on grain production and grain revenues occur on account of the freight rate increase. This conclusion is reflected more substantively in the estimates of export[1] volumes presented in Table 8.

[1] Exports in this context are exports from the prairie grain growing area, i.e. it includes grain going through Thunder Bay to Ontario and Quebec, as well as grain going to offshore points.

Table 8:

Estimates of Changes in Grain Exported From Western Canada and Revenues Therefrom

Item	Unit	Current Levels	After Change	Change Amount	Change Percent
Exports	M. ton	19.4	17.3	-2.1	-10.7
Revenues	M. $	1655.6	1372.0	-282.6	-17.0

Exports of grain are reduced by 2.1 million tons or 10.7 percent. Revenues to producers from this export trade are estimated to decline by $282.6 million or 17.0 percent.

Some of the grain displaced from the export trade is redirected to the feed grain market. Estimates of the amount of this change are reported in Table 9.

Table 9:

Estimates of Changes in Feed Grain Used in Western Canada and Gross Revenues from Feed Grains

Item	Unit	Current Levels	After Change	Change Amount	Change Percent
Feed Grain Use	M. ton	13.9	14.3	0.4	2.8
Revenues	M. $	1019.0	982.1	-36.9	-3.6

This table shows that there is an increase in feed grain used estimated to be equal to 0.4 million tons or 2.8 percent.

The rather modest expansion observed in feed grain use can be attributed to relatively low elasticities of demand for feed grains, a factor which also reflects in the revenues from feed grain use. Revenues from feed grains are shown in the second line of Table 9. These are estimated to decline from $1,019 million to $982.1 million, a reduction of $36.9 million or 3.6 percent.

The pattern of impact of a change in freight rates is not uniform across the different types of grain which are eligible for Crow Rates. Table 10 shows the relative impact of the changes on each of the six grains and two oilseeds that have been included in the study.

Table 10:

Estimates of Gross Revenue Reductions by Type of Grain

Grain	Revenue Reduction $ M	Percentage of Total Loss
Wheat	202.1	63.3
Oats	16.0	5.0
Barley	71.3	22.3
Mixed Grains	2.7	.8
Rye	4.0	1.3
Buckwheat	0.3	0.1
Flaxseed	7.6	2.4
Rapeseed	15.5	4.8
TOTAL	319.6	100.0

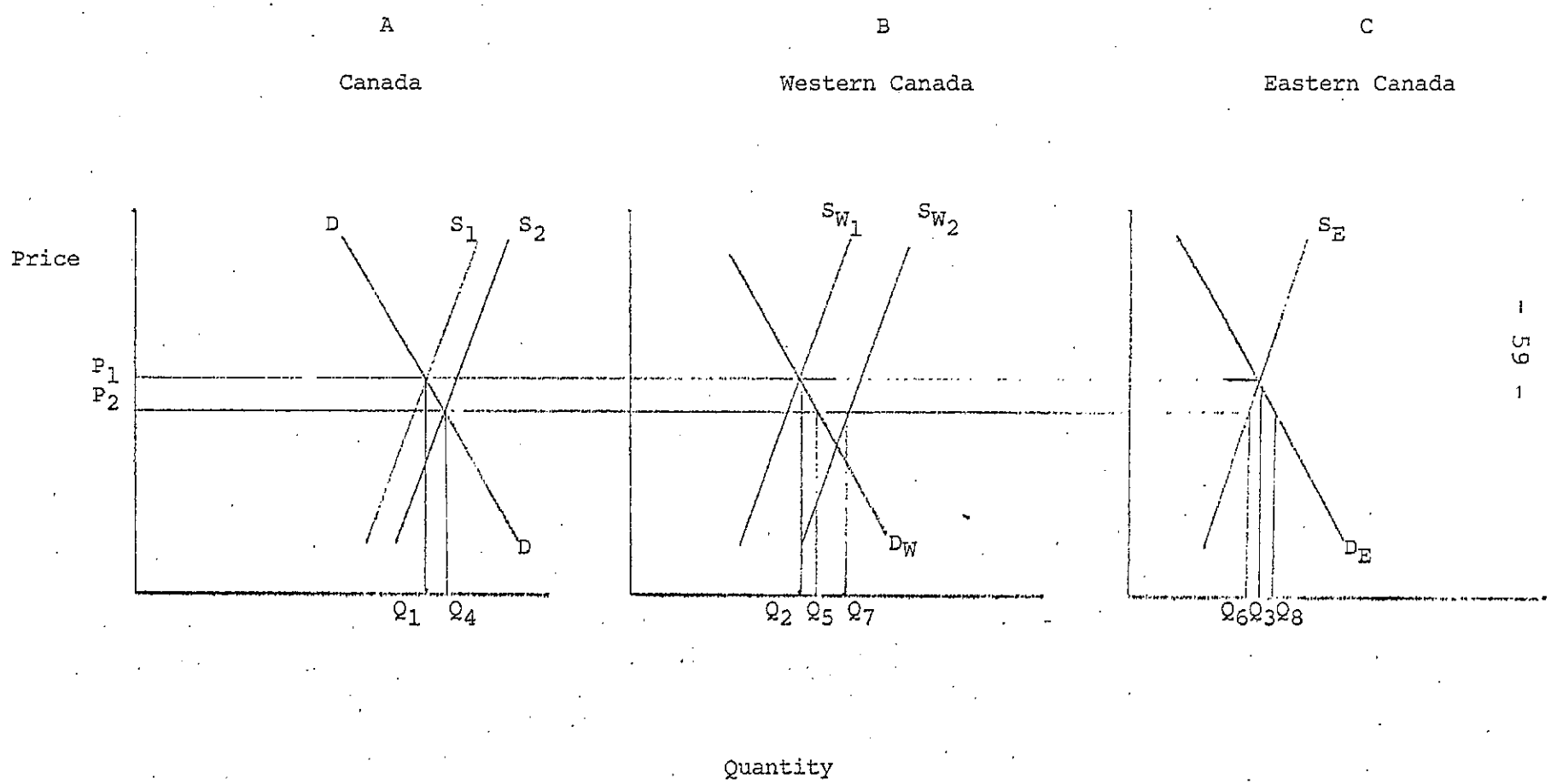
Inspection of Table 10 shows that wheat and barley absorb most of the shock of the change. Wheat takes some 63.3 percent of the impact and barley 22.3 percent. The impact on each of the other grains and the oilseeds is 5 percent or less. These observations reflect the dominance of wheat amongst the grains produced in Western Canada and also the fact that a large proportion of the wheat grown is sold for export.

Livestock Sector

The effects of a grain freight rate increase on livestock production have been evaluated using a methodology similar to that adopted for evaluating the impact on the grain sector. The theoretical model is illustrated in Figure 5. In this figure, the livestock market in Canada is perceived as having one set of total demands and two sources of supply; Eastern Canada and Western Canada. These three aspects of the market are represented by parts A, B and C of Figure 5. In Part A of the figure, total demand for livestock products is represented by DD. The situation in Western Canada is represented by Part B of the figure. The western share of demand is represented by D_W and the current western supply by S_{W_1}. The situation in Eastern Canada is represented by Part C of Figure 5. Demand is represented by D_E and supply by S_E.

Figure 5:

The Demand for, and Supplies of, Livestock in Canada and the Effect of an Increase in Freight Rates for Grain in Western Canada



The effect of an increase in freight rates for grain reflects into the livestock sector through the price and supply of feed grains. Since Crow Rates only apply in the West then only prices and supply of feed grains in the West are affected. Lower prices for feed grains in the West will encourage more feeding of these grains to livestock and increased output of them. This is reflected in Figure 5 by a movement to the right of the western supply curve in Part B of that figure. The new position of the supply curve is designated as S_{W_2}. There will be no movement at the supply curve in the East.

The increase in supply of livestock occurring in the West adds to the total supply of livestock produced in Canada. This condition is reflected in the establishment of a new supply curve S_2 in Part A of the figure. Observation of Part A of Figure 5 shows that this increased supply at the national level will cause the prices for livestock to decline. The amount of the decline is represented by the distance between P_1 and P_2. Further, this price decline reflects across both eastern and western markets and accordingly brings about a reduction in the supply from eastern markets represented by the distance between Q_3 and Q_6. It also brings about an increase in demand in eastern markets equal to the difference

between Q_3 and Q_6. The difference between supply and demand in the eastern market must be met from the increased production in the West since there is no increase in supply in the East. The amount of this increase is represented by the distance between Q_5 and Q_7 in the West. Thus we see that a reduction in the price of feed grains in the prairies brings about an expansion in livestock production in the West on account of both increased local demand and from increased demand and a reduction in the supply in the East.

Given estimates of the elasticity of total demand for livestock products plus the elasticity of supply for livestock products in the East, estimates can be made of the changes in livestock production in the West.

Data for livestock response to a change in feed grain prices have been taken from the work of Kulshreshtha.[1] Data for livestock slaughter in 1975 have been used as the basis for estimating changes in livestock production generated by a change in freight rates and feed grain prices.[2] Changes in five categories of livestock production have been analyzed. These are beef, pork, mutton and lamb, poultry meat and veal.

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[1] Kulshreshtha, S.N. and Eddy W. Reimer "An Integrated Economic Model of the Canadian Livestock Feed Sector". Canadian Journal of Agricultural Economics 23, #3, 1975.

[2] Data was taken from Agriculture Canada, Production and Marketing Branch, "Livestock Market Review 1975", Ottawa 1976.

The effects of a change in freight rates for export grains from 21¢ to 77¢ per 100 lbs. upon livestock production, as measured at slaughter, are reported in Table 11.

Table 11:

Estimates of Changes in Livestock Slaughter in Canada By Type of Livestock

Livestock Type	Unit	1975	Change	Amount	Percent
Beef	000 head	3,419	3,524	106	3.1
Pork	000 head	7,913	8,003	90	1.1
Mutton & Lamb	000 head	187	221	34	18.2
Poultry Meat	M. head	231	240	9	3.9
Veal	000 head	698	685	-14	- 2.0

The material in Table 11 shows that, with the exception of mutton and lamb changes in the livestock production and slaughter are quite modest, generally less than four percent.

The reason for the large change in mutton and lamb slaughter is not immediately obvious, other than the fact that it is generated by rather larger orders of magnitude in the supply and demand elasticities used for its derivation. Further analysis of this figure is obviously required before decisions involving its acceptance are taken.

The decline in the amount of veal slaughtered is thought to reflect the fact that more animals will now be kept to an older age, fed out using the cheaper grain and then sold as part of the finished beef market rather than as (younger) vealers.

The impact of the change in the prices of grain on egg production has not been estimated in this study. However it is probably worth noting that, to the extent that a reduction in feed grain prices affects the production of poultry meat positively, it is also likely that egg production will be positively affected. Similar orders of magnitude to the response in poultry meat may be appropriate as estimates of changes in egg production.

Currently both eggs and poultry meat production are under supply management programs. Consequently, the effects of a feed grain price reduction may be inhibited in these two types of livestock production. The same is likely true for dairy production, also under supply management. Nevertheless, there will be a stimulus for a small increase in production in each of these types of production generated by the reduction in feed grain prices.

Changes in the volume of slaughter in the West are reflected in Table 12.

Table 12:

Estimates of Increases in Livestock Slaughter in Western Canada

Livestock Type	Unit	Slaughter 1975	After Change	Difference Amount	Difference Percent
Beef	000 head	2,277	2,390	113	5.0
Pork	000 head	2,801	2,898	96	3.4
Mutton & Lamb	000 head	85	120	35	41.2
Poultry Meat	M. head	55	65	10	18.2
Veal	000 head	140	126	-14	-10.0

Inspection of this table indicates that the orders of magnitude of the change in the West are, as expected, greater than those for the country as a whole. The greatest response appears in the production of mutton and lamb with poultry meat production close behind.[1] Changes in the amount of beef and pork produced appear to be quite modest, at least on percentage basis.

Changes in the volume of production of livestock products in Eastern Canada are presented in Table 13.

[1] The earlier caveats in regard to these types of production should again be noted.

Table 13:

Estimates of Decline in Livestock Slaughter in Eastern Canada

Livestock Type	Unit	Slaughter 1975	After Change	Difference Amount	Difference Percent
Beef	000 head	1,142	1,134	-7	-0.6
Pork	000 head	5,112	5,106	-6	-0.1
Mutton & Lamb	000 head	101	100	-1	1.0
Poultry Meat	M. head	176	175	-1	0.5
Veal	000 head	558	558	0	0.0

Inspection of Table 13 shows that all changes in output in the East are of the order of 1 percent or less.

The livestock revenue situation consequent upon the change in grain freight rates is summarized in Table 14. Figures for total revenues (nationally) as well as estimates of the gross revenues in Eastern and Western Canada are presented.

Table 14:

Estimates of Changes in Gross Revenues from Livestock (at Slaughter), Canada, Eastern and Western Canada.

	1975	After Change ($ Million)	Difference Amount	Difference Percent
Canada	2,738	2,742	+ 4	0.1
West	1,332	1,366	+ 34	2.6
East	1,406	1,376	-30	2.1

The information in Table 14 suggests that there will be very little change in total revenues received by livestock producers in Canada following a change in freight rates. The main changes which do occur, result from a transfer of production and revenue from Eastern Canada to Western Canada. The total amount of transfer is estimated at about $30 million. This is quite modest in comparison to the reduction in gross revenues received by grain producers, estimated at $320 million.

Tables15 and 16 show the changes in livestock gross revenues, by type of livestock production, in Eastern and Western Canada.

Table 15:

Estimates of Changes in Gross Revenues from Livestock in Eastern Canada by Type of Livestock Production

Type of Livestock	Revenues		
	Before	After ($ M)	Change
Beef	436.1	419.1	-17.0
Hogs	687.0	682.1	- 4.9
Mutton & Lamb	2.2	2.1	- 0.1
Poultry Meat	221.9	213.8	- 8.1
Veal	58.1	58.4	0.3

This table shows that the benefit of Crow Rates to Eastern Livestock feeders is greatest for beef, significant for poultry meats and hogs and very small for mutton and lamb. There is an estimated (small) cost to veal of the Crow Rates.

Table 16:

Estimates of Changes in Gross Revenues from Livestock In Western Canada by Type of Livestock

Type of Livestock	Revenues ($M) Before	After	Change
Beef	869.7	883.2	13.5
Pork	376.5	387.1	10.6
Mutton & Lamb	1.9	2.6	0.7
Poultry Meat	69.7	79.8	10.1
Veal	14.6	13.2	-1.4
TOTAL	1,332.4	1,365.9	33.5

This table shows that, in the West, the cost of Crow Rates is highest for the beef industry. Pork and poultry meat bear about equal costs and mutton and lamb a very small amount. There is a net benefit to veal from the Crow Rates.

Railways

The primary effect on railways of the change in freight rates is a reduction in the amount of grain carried for export and a rather substantial increase in revenues obtained from carrying that grain. Estimates of the amount of grain carried and the railway revenues therefrom are presented below.

Table 17:

Estimates of Export Grain Carried and Railway Revenues Therefrom

Item	Unit	Before	After	Change Amount	Change Percent
Grain Carried	M. ton	19.4	17.3	2.1	10.7
Revenues	M. $	81.6	267.3	185.6	227.5

Observation of Table 17 shows that the reduction in grain carried is approximately 11 percent while the increase in railway revenues from carrying this grain is of the order of 228 percent.

It should be noted that not all of the losses sustained by grain producers appear as gains to the railways. Comparison of the estimates of grain producers revenue losses (Table 7) with those for railway revenues gained (above) shows producers losses are about 1.7 times railway gains. This situation exists because the prices of all grain (and hence revenues from all grains) are depressed by the change in grain freight rates. Railway revenues, by contrast, are derived from only that part of all grains which travel to export by rail. Before the change, the proportion of all grains moving to export is estimated to be 58 percent. After the change, the proportion falls to 45 percent. It is this latter percentage in conjunction with the new rates which determines the new level of railway revenues.

Secondary Effects

In addition to the primary effects on grain, livestock production and railway revenues described above, there are a number of secondary effects associated with an increase in export grain railway transportation rates. By and large,

these have not been examined in any detail in this study, but some mention of them is considered appropriate as they are affected by the Crow Rates. Several areas are touched on briefly below. They are grain handling, livestock processing, input supplying and the transportation of commodities other than export grain.

Grain Handling

It is perhaps obvious that the volume of grain handled by the grain handling system is likely to reduce under the circumstances of increased freight rates for export grain. Some estimates of the changes likely to occur can be made from observing the changes in total production (Table 7) and the amounts exported (Table 8).

In Table 8, it is noted that a reduction in export grain carried of 2.1 million tons might be expected as a consequence of an average increase of 56¢ per 100 lbs. in export freight rates. All of this flow would likely be lost to the elevator system, except for a small amount which it is estimated would be switched to feed uses. This latter amount is estimated (Table 9) to be 0.4 million tons. However, not all of this will move through the elevator system as at least some of it will be feed to livestock on or near the farms on which it is produced. If the amount of the latter is say half of the

increase in feed grain use, then the net loss to the elevator system from the change in freight rates would be 1.9 million tons or about 115 million bushels. If elevator charges average 3 3/4¢ per bushel,[1] the loss in elevator revenues would be about $4.25 million. Grain handling revenues would be reduced further if there was any reduction in grain stored at elevators.

Livestock Processing

Changes in numbers of livestock slaughtered have been estimated and have been reported in Tables 11 through 13, above. On a number-of-animals basis, the increases in throughput which packing houses would be required to handle is quite small. The changes, estimated to be less than 5 percent, are considered likely to be well within the capacity of existing plants. The situation regarding sheep and lambs as noted earlier, needs further investigation.

Any dollar benefits from increased packing house activity are expected to be quite small and have not been estimated.

Farm Supply Sector

There is likely to be a reduced demand for farm supplies going to the grain sector and some increase (probably

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[1] The current rate for wheat, barley, and rye.

marginal) in the supplies required by livestock feeders generated by an increase in export grain freight rates. The major purchased inputs of grain producers most likely to be affected by a change are probably farm machinery and fertilizer. Apart from feed, which has already been discussed, increased purchases by livestock producers are likely to be quite modest and involve small amounts of equipment, possibly buildings and working capital.

Transportation

It is noted that there would likely be some secondary effects on the transportation system arising from an increase in grain freight rates. The amount of these has not been estimated but it is thought worth noting that there is likely to be some increased movements of feed grains, probably by truck rather than rail, some increase in livestock transported and some increase in the volume of meat moving, particularly between West and East. The amounts of these movements seem likely to be greatest in the meat category, and rail transportation is likely to be used on account of the long distance involved. The other movements probably have smaller orders of magnitude.

Regional Considerations

The major regional considerations, i.e. those involving changes in production and processing between Eastern and Western Canada have already been identified and reported. These relate mainly to the location of increased livestock output and the processing thereof. The changes favour Western Canada but the dollar value of the changes are quite modest.

One point not already made is that relating to a possible interregional transfer of income by the railways. It is not known how the railways would spend the increased earnings implied in an increase in freight rates. To the extent that the increased revenues represent compensation for operating costs it should be concluded that most of the money would actually be spent in the West. Capital goods would likely be purchased in the East and profits disbursed there too. On balance, it would seem that a major share of the increased earnings would remain in the West.

In addition to identifying and evaluating the main East/West considerations related to Crow Rates certain intra-regional (within the prairies) effects have been examined.

Intra-Prairie Considerations

In this section consideration is given to the impact of grain freight rate changes at the sub-prairie

regional level; that is, at the provincial level and at specific rural locations. In this analysis, an attempt is made to disaggregate the macro-economic analysis already reported. We turn first to some general considerations and then to evaluating the effects of a change in freight rates at the provincial level.

General Impressions

Reference to a map of the prairies indicating the location of each type of grain and livestock production[1] gives a general impression of where the major impact of a change in freight rates will occur.

Examination of such a map shows that the greatest impact of the change in grain freight rates will likely occur in central and southern Saskatchewan. In these areas wheat is the dominant crop and there are few, if any, production alternatives.

Adjacent to this central area, in the general shape of a horseshoe, is an area where both grain and livestock (wheat and cattle particularly) are produced. This is likely where the trade off between grain and livestock will be the greatest. Outside this zone, to the northwest, in the Peace

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[1] E.g. National Atlas of Canada, 4th Edition, Revised, Ottawa. MacMillan Company of Canada, Toronto, 1974, page 137.

River country; in north central Alberta, northeastern Saskatchewan and in the Lake Manitoba and Winnipeg areas there are a greater number of production alternatives. Wheat is still grown in many of these areas, but outside of Saskatchewan is not the dominant crop. Accordingly we can expect the impact of grain freight rates to be less, on a "grains affected" basis, in these areas.

In addition to the effects of fewer production alternatives in Central Saskatchewan, it is also clear that farmers in this province will be the most affected on a cost-of-transportation basis as well. The Province of Saskatchewan and the wheat belt within that province, lie almost exactly equidistant between Vancouver and Thunder Bay, thus incurring the highest railway costs of any part of the prairies.

In summary then, it is apparent that the wheat belt of Central and Southern Saskatchewan will likely be the most adversely affected area of the prairies.

Provincial Impacts

An attempt has been made to measure the effects of a change in freight rates on each of the prairie provinces and (northeast) British Columbia. Basically the same model has been used for the provinces as was used for the Prairie Region as a whole. However, provincial demand and supply

elasticities are lacking and approximation procedures had to be used. The following estimates should therefore be used with caution and should be regarded only as general indications of approximately what the likely impacts might be.

The data presented in Table 18 below, represent attempts to establish the relative impact of the change in freight rates in each of the four provinces. The calculations have been made assuming that all grain moves through one point in each province.[1] The estimates in this table also assume that the elasticity of grain supplies in these provinces is zero. This assumption is not made, because the elasticities of grain suppliers in each province are thought to be zero, but rather because no actual estimates have been found.[2] Without these estimates it is difficult to proceed on a basis of supply elasticities different from zero. The adoption of an assumption of zero elasticity provides, at least, a (consistent) basis for estimation and does allow estimates of the price and revenue pressures-for-change in each province to be made. In general, this assumption results

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[1] Portage La Prairie, Regina, Vulcan and Dawson Creek, in Manitoba, Saskatchewan, Alberta and British Columbia, respectively.

[2] It is thought, for example, that grain supply elasticities might be higher in Alberta and Manitoba than in Saskatchewan.

in grain price depression effects being overestimated and (definitely) acreage response to be underestimated.

Table 18:

Estimates of the Changes in Gross Revenues from Grains By Province (assuming no change in acreage) Generated By an Increase in Export Grain Rail Freight Rates.

Province	Reduction In Grain Revenues $ M.	Percent of Total Reduction
Manitoba	35.6	12.3
Saskatchewan	162.6	56.4
Alberta	88.1	30.5
British Columbia	2.2	.8
	288.5[a]	100.0

The estimates presented in Table 18 support the earlier conclusion that Saskatchewan would be the most affected province. In fact, that province incurs greater than half the losses in grain revenues estimated to occur from the change in freight rates. Alberta comes second with 30.5 percent of the revenue reduction. The impact on Manitoba is less, at 12.3 percent, and the impact in British Columbia is below 1 percent of the total.

[a] The total amount of the grain revenue reduction established in Table 18 is less than that in Table 7 because of the restraint of zero supply elasticity imposed on the provincial analysis.

No attempt has been made to estimate changes in livestock production in each province. Provincial level demand and supply elasticities are needed and are generally lacking.

Local Effects

The problem of estimating local area impacts is similar to that involved in estimating provincial impacts. Estimates of local level elasticities are lacking and as well, estimates of production have to be based on 1971 census records. 1971 was not a particularly "normal" year in the prairies as the grain production pattern was affected by the Lower Inventories for Tomorrow (LIFT) program of the previous year. Nevertheless an attempt has been made to estimate local area effects using the available data. Seven prairie locations have been examined. These are Altona and Dauphin in Manitoba; North Battleford, Saskatoon and Swift Current in Saskatchewan; and, Grande Prairie and Lethbridge in Alberta.

Two measures of the impact of a freight rate change have been used. They are the reduction of Gross Revenues from Grain and the Weighted Average Feed Grain Price Reduction. Again, an assumption of zero supply elasticity is used. Comparisons between each of the local areas and provincial totals give some idea of the possible local area impacts. Again no estimates of impact on the livestock industry in

each area have been made for the same reasons as prevented a livestock analysis at the provincial level.

Table 19 presents the estimates of changes in grain revenues for each of the seven local areas and compares these figures to their relative percentages of provincial production. Inspection of this table shows that revenues from grain are depressed more in each of the seven areas than their equivalent share of provincial production. These estimates reflect both the distance of each of the areas from Thunder Bay or Vancouver, and the local area mix of types of grain currently produced. In the seven areas examined, the effects appear to be greatest in Grande Prairie and Swift Current areas.

Table 20 presents estimates of the change in weighted feed grain prices in each of the seven local areas and compares them to the provincial averages.

Table 19: Estimates of the Effects a Change in Freight Rates on Local Area Grain Revenues Relative to Production (assuming zero supply elasticities)

Province & Local Area	Current Grain Production (000 ton)	Grain Revenue Reduction $ M.	Percent of Provincial Production	Percent of Provincial Revenue Reduction
Manitoba	5,405	35.6		
Altona	546	3.7	10.1	10.4
Dauphin	278	2.0	5.1	5.6
Saskatchewan	17,753	162.6	100.0	
North Battleford	789	7.5	4.4	4.6
Saskatoon	1,169	11.3	6.6	6.9
Swift Current	1,337	13.7	7.5	8.4
Alberta	11,935	88.1		
Grande Prairie	1,345	13.1	11.3	14.9
Lethbridge	898	7.2	7.5	8.2

Table 20:

Estimates of Weighted Average Feed Grain Price Decline In the Three Prairie Provinces and Seven Local Areas (assuming zero supply elasticity).

Province & Local Area	Weighted Average Feed Grain Price Decline
Manitoba	8.2
Altona	8.3
Dauphin	8.8
Saskatchewan	11.1
North Battleford	12.2
Saskatoon	11.9
Swift Current	12.6
Alberta	9.5
Grande Prairie	12.9
Lethbridge	10.3

Again these figures reflect the relative distances of the local areas from export destinations and local area grain production mixes. Using this criterion Altona and Lethbridge are the least affected relative to provincial averages. Grande Prairie and Swift Current would be the most affected.

CONCLUSIONS

CONCLUSIONS

Based on the information assembled for and included in this study, the following conclusions are drawn regarding the significance of the Crow's Nest Pass Freight Rates to agricultural production and processing in Western Canada.

1. There is now a fairly substantial difference between the Crow's Nest Pass Freight Rates and the likely market freight rates for grain, grain products and oilseeds in the prairie region.

2. The spread between Crow Rates and the likely market rates for grains is now such that it generates an estimated Crow Rate benefit of $320 million to grain producers annually.

3. In part, this benefit to grain producers is obtained at the expense of livestock producers in Western Canada who must pay higher prices of feed grains due to the Crow Rates. It is estimated that approximately $34 million of livestock production is foregone in Western Canada on account of the Crow Rates.

4. The costs of the Crow Rates to the railways have been estimated to be about $186 million.

5. The benefits to grain producers are greater than the costs to the railways and livestock producer.

6. Benefits are related to distance from Thunder Bay and Vancouver and type of grain produced.

7. The benefits to grain producers are greatest in Saskatchewan.

8. Amongst the seven local areas examined in the study, benefits in the Swift Current, Saskatchewan and Grande Prairie, Alberta areas are proportionately greater than in the Lethbridge, North Battleford, Saskatoon, Dauphin and Altona areas.

9. Amongst the six grains and two oilseeds examined in this study, the benefit of Crow Rates is greatest for wheat and barley.

10. There is a moderate benefit to the grain handling system and a small loss to meat processing sector generated by the Crow Rates.

11. The supply responses of both grain and livestock production at the provincial and local area levels is largely unreported, and may be unknown. Detailed information on these parameters is needed for a better evaluation of the provincial and local area benefits and costs of the Crow Rates, than has been possible in this study. Water and

farm labour availability and farmer attitudes towards livestock raising are suggested as areas likely to be important to grain and livestock supply responses in the prairie area.

RECOMMENDATION

RECOMMENDATION

In light of the conclusions presented above the following recommendation is made.

1. That a detailed examination of the constraints to expanded livestock production in Western Canada be undertaken.

(This examination holds the key to better assessing the benefits and costs of Crow Rates at the local level. Market potentials and physical, biological and social constraints to increased production need to be examined.)

SUMMARY

SUMMARY

This report presents the findings of an examination of the significance of the Crow's Nest Pass Freight Rates for production and processing of agricultural products in Western Canada.

A history of the Crow's Nest Pass Freight Rates, since their inception in 1897 through 1976, is reported. In 1976, these freight rates apply to grain and flour, flaxseed and flaxseed products, rapeseed and rapeseed products and a number of related commodities. Originally, the rates applied only to movements from prairie shipping points to Thunder Bay. Now the rates apply on movements to Vancouver, Prince Rupert and Churchill for export as well. Typical Crow Rates in 1976 are those from Edmonton and Calgary to Vancouver, and from Regina to Thunder Bay; all of which are 20 cents per 100 lbs. for grain and 21½ cents per 100 lbs. for oilseeds and oilseed products.

The significance of these rates for agricultural production and processing has been evaluated by way of examining the difference between Crow Rates and estimated likely market rates for the same commodities moving to the same destinations. The estimated likely market rates are above the Crow Rates.

The difference between the Crow and market rates in the prairies varies by location of shipping point and by type of grain moved. Typical estimates of the difference are 47 cents per 100 lbs. for Calgary, 53 cents for Edmonton to Vancouver and 54 cents for Regina to Thunder Bay. On a per bushel basis, the difference is greatest for wheat and least for oats. Estimates of the differences between the two rates for these two commodities on the Regina to Thunder Bay route are 32½ cents and 18 cents per bushel, respectively.

The fact that Crow Rates are below estimated market rates results in a benefit to grain producers and an implied cost to livestock producers and the railways. It is estimated that the benefit to grain producers at the Crow Rates is $320 million per annum. Losses to western Canadian livestock producers (in terms of production foregone) are estimated to be $34 million. Losses to the railways (also in terms of income foregone on account of the Crow Rates) are estimated to be $185 million.

The effects of the Crow Rates on six types of grain (wheat, oats, barley, mixed grain, rye and buckwheat), two oilseeds (flaxseed and rapeseed), and five types of livestock production (beef, pork, mutton and lamb, poultry meat

and veal) have been examined. The benefits are greatest for wheat and barley (63 percent and 22 percent of the total benefit to grains and oilseeds), less for oats, rye and mixed grains (five, one and one percent, respectively), and least for buckwheat (less than one percent). The effects on oilseeds are estimated to be quite modest (two percent and five percent of the total benefit to grains and oilseeds, respectively).

Costs to the livestock industry in Western Canada are estimated to be quite small relative to benefits to grain producer, approximately 11 percent in dollar terms. This relatively small cost is the consequence of two factors. First, only about one-fifth of the reduction in exports generated by higher freight rates would, it is estimated, be redirected to livestock production under market rates. The other four-fifths would not be produced. Second, the elasticities of demand for the livestock products examined in this study are such that revenues from these products would increase only very marginally if production were to increase in response to the lower feed grain prices expected under market rates for export grains.

Costs of the Crow Rates by type of livestock production are greatest forbeef, less for hogs and poultry, and least for mutton and lamb. There is an estimated

(small) benefit for veal arising from the fact that fewer animals are fed out under Crow Rates in Western Canada.

Benefits for export grains are estimated to be substantial. The difference is estimated to be $283 million in export grain revenues. Part of this amount arises from greater production and export sales of wheat and barley under the Crow Rates, and part from lower costs of transportation to export position.

The benefits of Crow Rates in each of the four western provinces have been examined. Because of longer distances to export position and because of the dominance of wheat in the production pattern of the Province of Saskatchewan, this province benefits most from the Crow Rates. It is estimated that 56 percent of the total Crow benefit accrues to grain producers in that province. Alberta takes second place with 31 percent of the benefit. Manitoba has an estimated 12 percent and British Columbia one percent of the total benefits to grain producers.

Benefits of the Crow Rates have also been assessed at seven specific locations in the prairie area: Altona and Dauphin in Manitoba; North Battleford, Saskatoon and Swift Current in Saskatchewan; and, Grande Prairie and Lethbridge in Alberta. Data for an analysis at this level

of disaggregation proved difficult to obtain and the estimates presented in the findings of this part of the study are tentative. Results are expressed in terms of impact of the Crow Rates at these locations, relative to provincial level impacts. Greater benefits appear to accrue at Swift Current and Grande Prairie then at the other points.

Information regarding likely livestock production responses to lower feed grain prices (generated by higher export grain freight rates) at the provincial and local area levels of production are largely lacking or are unreported. Because of the inadequacy of this data, it has not been possible to estimate the costs of the Crow Rates to western livestock producers at the provincial and local area levels.

Some of the secondary benefits and costs of the Crow Rates have been examined briefly. Benefits to the grain handling system and costs to livestock processing have been estimated and are quite modest. The possibilities of benefits and cost to the farm supply and transportation (other than export grain) sectors have been noted.

A recommendation is made that data for the livestock production response to lower feed grain prices at the

provincial and local area level of production. It is noted that in this study, markets are constraining to increased earnings from livestock production. It is suggested that that water, farm labour and prairie farmer attitudes towards livestock husbandry may also be important.

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APPENDICES

APPENDIX A

The Crow's Nest Pass Agreement

DATED 6th SEPTEMBER, A.D. 1897

AGREEMENT

Between Her Majesty, Queen Victoria, represented by the Minister of Railways and Canals

AND

The Canadian Pacific Railway Company

Re: Subsidies to construct a railway from Lethbridge in the Territory of Alberta through the Crow's Nest Pass to Nelson, B.C.

THIS INDENTURE made the Sixth day of September in the year one thousand eight hundred and ninety-seven between Her Majesty the Queen acting in respect of the Dominion of Canada and herein represented by the Minister of Railways and Canals, hereinafter referred to as "the Government", of the first part, and the Canadian Pacific Railway Company hereinafter referred to as "the Company", of the second part.

Whereas it was enacted in effect in an Act passed in the last Session of the Parliament of Canada held in the sixtieth and sixty-first years of Her Majesty's reign intituled "An Act to authorize a subsidy for a Railway through the Crow's Nest Pass" that: subject to the conditions therein mentioned, the Governor in Council might grant to the Canadian Pacific Railway Company a subsidy towards the construction of a railway from Lethbridge in the Territory of Alberta through the Crow's Nest Pass to Nelson, in the Province of British Columbia (which railway is hereinafter called "the Crow's Nest Line") to the extent of eleven thousand dollars per mile thereof, and not exceeding in the whole the sum of three million six hundred and thirty thousand dollars, payable by instalments on the completion of each of the several sections of the said railway of the length respectively of not less than ten miles, and the remainder on the completion of the whole of the said railway to the satisfaction of the Minister of Railways and Canals provided that an agreement between the Government and the Company should be first entered into in such form as the Governor in Council may think fit, containing covenants to the following effect, that is to say:

On the part of the Company:

(a) That the Company would construct or cause to be constructed, the said railway upon such route and according to such descriptions and specifications and within such time or times as should be provided for in the said agreement, and, when completed would operate the said railway forever; and also covenants to the effect of those hereinafter contained and numbered consecutively from 8 to 15 inclusive.

AND WHEREAS the Governor in Council has duly approved of the description, conditions and specifications hereto annexed, marked "C" as the descriptions, conditions and specifications for the construction of the said railway.

NOW THIS INDENTURE WITNESSETH that in consideration of the premises and of the covenant on the part of the Government hereinafter contained the Company doth hereby for itself and its successors covenant with the Government as follows, that is to say:

1. The Company shall and will well and truly and faithfully make, build, construct and complete a line of railway called the Crow's Nest Line from Lethbridge in the Territory of Alberta through the Crow's Nest Pass to Nelson in the Province of British Columbia, the points and approximate route and course being shown on the plans marked "A" and "B" hereunto annexed and in accordance with the specification hereunto annexed marked "C", and all bridges, culverts and works appurtenant thereto, and will build, construct and complete the said line of railway, bridges and culverts, and perform all engineering services, whether in the field or in preparing plans or doing other office works, to the entire satisfaction of the Governor in Council.

2. The Company shall and will locate and construct the said line of Railway on as straight a course as practicable, between the points above mentioned, with only such deviations as shall be allowed by the Governor in Council.

3. The gradients and alignment shall be the best that the physical features of the country will admit of in conformity with the aforesaid specifications hereunto annexed marked "C".

4. The Company shall and will furnish profiles location and other plans and bills of quantities of the whole line of railway in ten-mile sections, and before the work is commenced on any ten-mile section, such profiles location and other plans and bills of quantities shall be approved by the Governor in Council, and before any payments are made, the Company will furnish such further returns as may be required to satisfy the Minister of Railways and Canals as to the relative value of the works executed with that remaining to be done.

5. The Company shall commence the Works embraced in this agreement forthwith and shall prosecute the same with all reasonable despatch so that the line may be completed to the South end of Kootenay Lake on or before the thirty-first day of December, 1898, or such later date as the Governor in Council may upon good cause shown grant and allow and so that the remaining portion of the railway viz: from the South end of Kootenay Lake to the Town of Nelson shall be completed not later than the thirty-first day of December, 1900, or such later date as may for like good cause be in like manner allowed. In the meantime, that is to say, from the time of the completion of the said line to the South end of the Kootenay Lake and the final completion of the whole line to Nelson the Company shall provide such facilities as may be necessary for the carriage of freight in car loads without transhipment between the South end of Kootenay Lake and Nelson, time being declared to be material and of the essence of this contract and in default of such completion as aforesaid the Company shall forfeit all right, claim or demand to any and every part of the subsidy remaining unpaid as also to any moneys whatever which may be at the time of the failure of the completion as aforesaid due and owing to the Company.

6. The Company will upon and after the completion of the said line of Railway and works appertaining thereto truly and faithfully keep the same and the rolling stock required therefor in good and sufficient working and running order, and shall continuously and faithfully operate the same forever.

7. The Company will build, construct and complete the said line of railway and works appertaining thereto in all respects in accordance with the specification hereto annexed, marked "C"; and upon a line of location to be approved of by the Governor in Council.

8. The said line of Railway shall be constructed through the Town of McLeod, and a station shall be established therein, unless the Governor in Council is satisfied by the Company that there is good cause for constructing the railway outside the limits of the said Town, in which case the said line of railway shall be located and a station established at a distance not greater than five hundred yards from the limits of the said town.

9. So soon as the said railway is opened for traffic to Kootenay Lake, the local rates and tolls on the railway and on any other railway used in connection therewith and now or hereafter owned or leased by or operated on account of the Company South of the Company's main line in British Columbia, as well as the rates and tolls between any point on any such line or lines of railway and any point on the main line of the Company throughout Canada, or any other railway owned or leased by or operated on account of the Company, including its lines of steamers in British Columbia shall be first approved by the Governor in Council or by a Railway Commission, if and when such Commission is established by law, and shall at all times thereafter and from time to time be subject to revision and control in the manner aforesaid.

10. A reduction shall be made in the general rates and tolls of the Company as now charged, or as contained in its present freight tariff, whichever rates are now the lowest, for carloads or otherwise, upon the classes of merchandise hereinafter mentioned, westbound, from and including Fort William and all points East of Fort William on the Company's Railway to all points West of Fort William on the Company's main line, or on any line of railway throughout Canada owned or leased by or operated on account of the Company whether the shipment is by all rail line or by Lake and rail, such reduction to be to the extent of the following percentages respectively, namely:—

Upon all green and fresh fruits, 33⅓ per cent;
Coal oil, 20 per cent;
Cordage and binder twine, 10 per cent;
Agricultural implements of all kinds, set up or in parts, 10 per cent;
Iron, including bar, band, Canada plates, galvanized, sheet, pipe, pipe-fittings, nails, spikes and horse-shoes, 10 per cent;
All kinds of wire, 10 per cent;
Window glass, 10 per cent;
Paper, for building and roofing purposes, 10 per cent;
Roofing felt, box and packing, 10 per cent;
Paints of all kinds and oils, 10 per cent;
Live stock, 10 per cent;
Wooden-ware, 10 per cent;
Household furniture, 10 per cent;

And no higher rates than such reduced rates or tolls shall be hereafter charged by the Company upon any such merchandise carried by the Company between the points aforesaid; such reductions to take effect on or before the first of January — one thousand eight hundred and ninety-eight.

11. There shall be a reduction in the Company's present rates and tolls on grain and flour from all points on its main line, branches or connections west of Fort William to Fort William and Port Arthur and all points East, of three cents per one hundred pounds, to take effect in the following manner:— one and one-half cent per one hundred pounds on or before the first day of September, one thousand eight hundred and ninety-eight, and an additional one and one-half cent per one hundred pounds on or before the first day of September, one thousand eight hundred and ninety-nine; and no higher rates than such reduced rates or tolls shall be charged after the dates mentioned on such merchandise from the points aforesaid;

12. The Railway Committee of the Privy Council may grant running powers over the said line of railway and all its branches and connections, or any portions thereof, and all lines of railway now or hereafter owned or leased by or operated on account of the Company in British Columbia south of the Company's main

line of railway, and the necessary use of its tracks, stations and station grounds, to any other railway Company applying for such grant upon such terms as such Committee may fix and determine, and according to the provisions of the Railway Act and of such other general acts relating to railways as are from time to time passed by Parliament; but nothing herein shall be held to imply that such running powers might not be so granted without the special provision herein contained;

13. The said railway, when constructed, together with that portion of the Company's railway from Dunmore to Lethbridge, and all lines of railway, branches, connections and extensions in British Columbia south of the main line of the Company in British Columbia shall be subject to the provisions of the Railway Act, and of such other general Acts relating to Railways as are from time to time passed by Parliament;

14. If the Company or any other Company with whom it shall have any arrangement on the subject shall, by constructing the said railway or any part of it, as stipulated for in this agreement, become entitled to and shall get any land as a subsidy from the Government of British Columbia, then such lands, excepting therefrom those which in the opinion of the Director of the Geological Survey of Canada (expressed in writing) are coal-bearing lands, shall be disposed of by the Company or by such other Company to the public according to regulations and at prices not exceeding those prescribed from time to time by the Governor in Council, having regard to the then existing provincial regulations applicable thereto; the expression "lands" including all mineral and timber thereon which shall be disposed of as aforesaid, either with or without the land, as the Governor in Council may direct;

15. If the Company or any other Company with whom it shall have any arrangement on the subject shall, by constructing the said railway or any part of it as stipulated for in this agreement, become entitled to and shall get any lands as a subsidy from the Government of British Columbia which in the opinion of the Director of the Geological Survey of Canada (expressed in writing) are coal-bearing lands, then the Company will cause to be conveyed to the Crown, in the interest of Canada, a portion thereof to the extent of fifty thousand acres; the same to be of equal value per acre as coal lands with the residue of such lands. The said fifty thousand acres to be selected by the Government in such fair and equitable manner as may be determined by the Governor in Council, and to be thereafter held or disposed of or otherwise dealt with by the Government as it may think fit on such conditions, if any, as may be prescribed by the Governor in Council, for the purpose of securing a sufficient and suitable supply of coal to the public at reasonable prices, not exceeding two dollars per ton of two thousand pounds free on board cars at the mines;

16. The Company shall not let or sub-let the said works or any portion thereof to any foreigner, or any corporation composed wholly or in part of foreigners, or employ or suffer to be employed on the said works any person who is not at the date hereof a British subject or a bona fide resident of Canada, or who is not certified to by an agent of the Immigration Department of Canada as having come to Canada as an immigrant, intending to bona fide settle in the country, unless either the Minister of Railways is satisfied that there is not available sufficient Canadian labour to enable the Company to complete the works within the time limited therefor as aforesaid, or there be some other reason which shall be deemed by the Governor in Council sufficient in the public interest, in which case or cases, and in so far as the said Minister may deem it necessary, and for any particular portion or portions of the work, and for any specified period or periods, and as to any particular number of persons, he may from time to time consent in writing to the employment of such persons as are hereby otherwise prohibited, — provided that nothing herein shall be held to prevent the importation of any manufactured materials required by the Company for the

construction of the railway upon payment of the established Customs duties; and further that upon any wilful or negligent breach of this covenant being established to the satisfaction of the Governor in Council, the Company shall be liable to forfeit and pay out of the subsidy earned and otherwise payable to them such sum as liquidated damages as the Governor in Council may determine upon for each day any prohibited person may be so employed.

17. And the Government covenants to pay to the Company the said subsidy by instalments as aforesaid.

In Witness Whereof the Honourable Andrew G. Blair, the said Minister of Railways and Canals hath caused to be hereto set his hand and the seal of the Department of Railways and Canals and the signature of the Secretary of the said Department and the Company has caused to be hereto set its Corporate Seal and the hand of its President and its Acting Secretary.

Signed, Sealed and Delivered by the Company in the presence of:

Signed, Sealed and Delivered by the Minister and Secretary of Railways and Canals in the presence of:
(Sgd.) Walter S. Doull

(Sgd.) H. G. Joly de Lotbiniere
Acting Minister of Railways and Canals.
(Sgd.) L. R. Jones
Secretary.

The Canadian Pacific Railway Company
(Sgd.) W. C. Van Horne
President.

(Sgd.) A. R. G. Heward
Acting Secretary.

Source: C.P. Rail. "Railway Grain Rates. A Source Book". Montreal. April, 1975.

TO THUNDER BAY

SPECIFIC RULES

Rule No. 130:

APPLICABLE IN CONNECTION WITH TERMINAL AND COMMODITY RATES SHOWN IN SECTIONS 1 AND 2

List of Commodities on which Rates Apply, also Minimum Carload Weights:

Commodities	Minima (See Notes 2, 3 and 4, herein)	
	Cars with Capacity less than 100,000 lbs.	Cars with Capacity 100,000 lbs. and over
Grain Rates Apply on—		
Barley (STCC 01 131 10)	80,000 lbs.	100,000 lbs.
Buckwheat (STCC 01 139 10)	80,000 lbs.	100,000 lbs.
①Corn (not popcorn) (STCC 01 132 15)	80,000 lbs.	⑤112,000 lbs.
Oats (STCC 01 133 10)	60,000 lbs.	80,000 lbs.
Rye (STCC 01 135 10)	80,000 lbs.	⑤112,000 lbs.
④Seed Grain in sacks (STCC 01 159 90)	60,000 lbs.	75,000 lbs.
Speltz (STCC 01 139 15)	80,000 lbs.	⑤115,000 lbs.
Wheat (STCC 01 137 10)	80,000 lbs.	⑤115,000 lbs.
Grain Products Rates Apply on—		
Barley, Crushed (STCC 20 419 46)	50,000 lbs.	50,000 lbs.
Barley, Pearl		
Barley, Pot		
Barley Sprouts (STCC 20 832 20)	40,000 lbs.	40,000 lbs.
Bran (STCC 20 419 91)	50,000 lbs.	50,000 lbs.
Breakfast Foods or Cereals (uncooked). (See Note 1.)		
In bags, barrels or cases		
②Brewers' Dried Grain (STCC 20 419 38)		
Cleanings, Barley		
①Corn, Cracked		
③Distillers' Dried Grain		
②Feed, Animal and/or Poultry (not medicated or condimental), containing not more than thirty-five per cent (35%) of ingredients other than commodities taking Grain or Grain Products Rates, and/or Flaxseed Products as specified in this Rule, in bags or barrels or in bulk		
Feed, Chopped		
①Flour, made from grain or malt only, in bags or barrels		
Grain, Feed, in sacks		
Grits (STCC 20 419 93)		
Groats (STCC 20 419 26)		
Hulls, Oat (STCC 20 418 30)		
Malt (made from Grain only) (STCC 20 831 10)		
Meal, Barley		
①Meal, Corn (STCC 20 413 15)		
Meal, Oat (STCC 20 416 15)		
Meal, Rye (STCC 20 414 15)		
Meal, Wheat (STCC 20 419 60)		

For explanation of reference marks used herein, see end of Rule.

(Continued on next page)

SPECIFIC RULES

Rule No. 130:
(Continued)

APPLICABLE ONLY IN CONNECTION WITH TERMINAL AND COMMODITY RATES SHOWN IN SECTIONS 1 AND 2

List of Commodities on which Rates apply, also Minimum Carload Weights:

Commodities	Minima (See Notes 2, 3 and 4, herein)	
	Cars with Capacity less than 100,000 lbs.	Cars with Capacity 100,000 lbs. and over
Grain Products Rates Apply on—(Concl'd)		
Middlings (STCC 20 412 90)		
Oats, Crushed (STCC 20 419 66)		
Oats, Rolled (STCC 20 432 90)		
②Pulp, Beet, dried, sweetened or not sweetened (STCC 20 619 30)		
Screenings (applicable only on Screenings from commodities specified herein under the heading Grain rates apply on—)	50,000 lbs.	50,000 lbs.
Shorts (STCC 20 412 90)		
Sweepings (applicable only on Sweepings from commodities specified herein under the heading Grain rates apply on—)		
Wheat Germ (STCC 20 419 72)		
Wheat, Rolled (STCC 20 419 74)		
"Flaxseed" Rates Apply on—		
Flaxseed (STCC 01 142 10)	80,000 lbs.	②112,000 lbs.
Rapeseed (STCC 01 149 50)	80,000 lbs.	②103,000 lbs.
"Flaxseed Products" Rates Apply on:		
Flaxseed Screenings (STCC 20 939 52)		
②Hulls, Sunflower Seed, Ground		
Meal, Linseed (STCC 20 939 14)		
Meal, Oil Cake, Linseed (STCC 20 939 14)		
Meal, Oil Cake, Rapeseed (STCC 20 939 14)		
②Meal, Oil Cake, Sunflower Seed (STCC 20 939 14)		
②Meal, Oil Cake, Weed Seed	50,000 lbs.	50,000 lbs.
②Meal, Soybean (STCC 20 421 54)		
Oil Cake, Linseed (STCC 20 939 14)		
Oil Cake, Rapeseed (STCC 20 939 14)		
②Oil Cake, Sunflower Seed (STCC 20 939 14)		
②Oil Cake, Weed Seed		
Rapeseed Screenings		

For explanation of reference marks used herein, see end of Rule.

(Concluded on next page)

SPECIFIC RULES

Rule No. 130:
(Concluded)

APPLICABLE ONLY IN CONNECTION WITH TERMINAL AND COMMODITY RATES SHOWN IN SECTIONS 1 AND 2

Note 1(a) Breakfast Foods, or Cereals, uncooked, i.e., which require cooking before being served as foods must be described on bills of lading as "Uncooked Cereals," otherwise Classification ratings will apply.

(b) Breakfast Foods or Cereals, uncooked, containing ingredients other than Grain or Grain Products must be so described on bills of lading. Rates in Sections 1 and 2 will not apply. For applicable rates see Rule 150, Section 3.

Note 2—All shipments under this tariff will be correctly weighed and charged for at actual weight when in excess of the specified minimum. WHEN THE ACTUAL WEIGHT IS LESS THAN THE SPECIFIED MINIMUM, THE MINIMUM WILL BE CHARGED. (Exception—See Note 3 below.)

Note 3—The carload minima specified will apply, except when cars are loaded to their full visible capacity and will not contain the minima specified, the actual weight is to apply, but not less than:

Bran and Oat Hulls	45,000 lbs.	Grain Screenings and Grain Sweepings	40,000 lbs.
Brewers' Dried Grain	40,000 lbs.	Pulp, Beet, dried, sweetened or not sweetened	40,000 lbs.
Distillers' Dried Grain	40,000 lbs.		

Note 4—Shipments in bulk, in airslide self-unloading cars or in covered hopper cars, will be subject to carload minimum specified in this rule, but not less than 70,000 lbs. Shipments in such equipment will not be entitled to mileage allowance.

Explanation of Reference Marks Used in this Rule

①On Corn and products thereof the transit arrangement authorized in Rule 120 will apply only on corn grown in Canada and the products thereof.

②Transit arrangements authorized in Rule 120 will not apply.

③The minimum carload weights specified will apply, except when stencilled load limit of car used is the same as or less than the carload minimum weight, in which event the minimum will be the actual weight but not less than 100,000 lbs.

④Transit arrangement authorized in Rule 120, will apply only on Seed Grain in sacks reshipped from the cleaning or storage in transit point.

For explanation of abbreviations and reference marks not explained above, see concluding page of tariff.

CROW RATE SCHEDULE[1]

Miles to Fort William	Rate
Up to 296.5 miles	13½¢ per 100 lbs.
" " 419.1 "	14¢ " " "
" " 474.7 "	15¢ " " "
" " 552.2 "	16¢ " " "
" " 577.0 "	17¢ " " "
" " 683.1 "	18¢ " " "
" " 742.5 "	19¢ " " "
" " 817.1 "	20¢ " " "
" " 851.8 "	21¢ " " "
" " 927.8 "	22¢ " " "
" " 1012.0 "	23¢ " " "
" " 1119.1 "	24¢ " " "
" " 1191.0 "	25¢ " " "
" " 1251.8 "	26¢ " " "
" " 1275.4 "	27¢ " " "
" " 1284 "	28¢ " " "
" " 1300 "	28¢ " " "
" " 1325 "	29¢ " " "
" " 1350 "	29¢ " " "
" " 1375 "	30¢ " " "
" " 1400 "	31¢ " " "
" " 1425 "	31¢ " " "
" " 1450 "	32¢ " " "
" " 1475 "	32¢ " " "
" " 1500 "	33¢ " " "
" " 1525 "	33¢ " " "
" " 1550 "	34¢ " " "
" " 1575 "	34¢ " " "
" " 1600 "	35¢ " " "

For intermediate points, use rates given for next greater distance.

[1] Source: C.P. Rail. Rates Division. Vancouver, B.C. "Bases for Current Western Line Tariffs. SectionK. Memorandum for Tariff File No. W-819-A,Winnipeg, Manitoba effective January 16, 1950." (Note: This basis was first applied effective September 12, 1927 and is the basis of both current eastbound and westbound C.P.R. "Crow Rate" Tariffs: W-425A and W430A.

Appendix D

NORTH DAKOTA, U.S.A. RAIL GRAIN FREIGHT RATE EQUATIONS

A. EASTBOUND: North Dakota Points to Duluth: Wheat

1. Summer full service rate (13)

$Y = 17.20 + 0.12743343 X$; $R^2 = .746$; $N = 193$

Range of Applicability: 250 to 750 miles

2. Winter full service rate (18)

$Y = 14.4455 + 0.12254388 X$; $R^2 = .841$; $N = 193$

Range of Applicability: 250 to 750 miles

3. Summer restricted rate (15)

$Y = 12.5939 + 0.10531908 X$; $R^2 = .896$; $N = 193$

Range of Applicability: 250 to 750 miles

4. Winter restricted rate (20)

$Y = 5.8194 + 0.10259435 X$; $R^2 = .899$; $N = 193$

Range of Applicability: 250 to 750 miles

B. WESTBOUND: North Dakota Points to Portland, Oregon: Wheat

5. Domestic rate (35)

$Y = 164.3934 + 0.05017298 X$; $R^2 = .269$; $N = 193$

Range of Applicability: 1100 to 1900 miles

6. Summer export rate (39)

$Y = 210.734 - 0.04554386 X$; $R^2 = 293$; $N = 193$

Range of Applicability: 1100 to 1900 miles

7. Winter export rate (43)

$Y = 186.272 - 0.03139877 X$; $R^2 = .264$ $N = 193$

Range of Applicability: 1100 to 1900 miles

Appendix D continued:
North Dakota Rail Grain Rates (Continued)

WESTBOUND: Nebraska Shipping Points to Portland: Wheat

8. Export rate (53)

$Y = 106.807 + 0.00588961\ X$; $R^2 = 678$; $N = 27$

Range of Applicability: 1400 to 1650 miles

Where Y = freight rate in cents per 100 lbs.

And X = distance in miles

Numbers in brackets; e.g. (53), refer to the number of the equation in the original source (see below).

Source: Tosterud, Robert J. "North Dakota Wheat: Transportation Characteristics . Appendix C." Verified Statement No. 3 before the Interstate Commerce Commission Ex Parte 270 (Sub. No. 9) Investigation of Railroad Freight Rate Structure - Grain and Grain Products. Fargo, North Dakota, U.S.A. Upper Great Plains Transporation Institute. February 2, 1976.

Appendix E

COMMODITY
OWN PRICE DEMAND ELASTICITIES

Commodity:	
Wheat	.46
Oats	.25
Barley	.53
Mixed Grains	.28
Rye	.40
Buckwheat	.40
Flaxseed	.50
Rapeseed	.50

Source: Kulshreshtha, S.N. and Reimer, E.W. "An Integrated Econometric Model of the Canadian Livestock-Feed Sector" Canadian Journal of Agricultural Economics 23, #3, 1975, Table 2.

Rye and Buckwheat are the authors estimates.

Appendix F

COMMODITY
OWN PRICE SUPPLY ELASTICITIES

Commodity	Estimator	Estimate Short Run Low	Short Run High	Long Run Low	Long Run High	Other Low	Other High
Wheat	Hutchison					.51	
	Schmitt	.42	.75	.62	1.30	.49	.88
	Missaien					.61	.82
	Meilke	.35		.69			
	Meinken					.70	
	Adopted					.65	
Barley	Meilke	.70		1.35			
	Adopted					.70	
Oats	Missaien					.51	.66
	Meilke	.62		2.13			
	Adopted					.60	
Mixed Grains	Author					.50	
Rye	Author					.50	
Buckwheat	Author					.50	
Flaxseed	Author					.50	
Rapeseed	Paddock					2.60	

Sources: Hutchison and Schmitt as quoted in Missaien.
Missaien, E. and Cotting, A.L. "Canada: Growth Potential of the Grain and Livestock Sectors". U.S.D.A. E.R.S. Foreign Agricultural Economic Report #77, Washington, D.C., 1972.

Meilke, K. "Acreage Response to Policy Variables in the Prairie Provinces". American Journal of Agricultural Economics 58, #3, August, 1976, pp. 572-577.

Meinken as quoted by Gislasen, Conrad in "Cost of Canadian Wheat Board to Farmers", Journal of Farm Economics 41, 1969. p. 593.

Paddock, Brian "Supply Analysis of Rapeseed Acreage". Can. Journal of Ag. Economics 19, #1, 1971. pp. 110-117.

CROW'S NEST PASS FREIGHT RATES FOR PROCESSED FORMS OF GRAINS AND OILSEEDS

by

Peter L. Arcus

An Addendum to A Report Entitled "The Significance of the Crow's Nest Pass Freight Rates For the Production and Processing of Agricultural Products In Western Canada."

Department of Regional Economic Expansion
Western Region Headquarters
Saskatoon

December 1976

CROW'S NEST PASS FREIGHT RATES FOR PROCESSED FORMS OF GRAINS AND OILSEEDS

As an alternative to the application of market rates to CNP commodities, an equalization between the freight rates applicable to raw and processed forms of grains and oilseeds has been proposed. This concept and its application are examined below.

Concept

In general, the concept of this alternative is that CNP rates are prejudicial to agricultural product processing in the West and that one way to eliminate this prejudice would be to afford both raw and processed forms of grains and oilseeds equal freight rates. In this paper, the interpretation given this concept is that CNP rates should apply to the following grain and oilseed products: flour, malt, mixed feed, linseed oil, linseed meal, rapeseed oil and rapeseed meal.

Application

An examination of the CNP tariffs[1] shows that flour, malt, some mixed livestock feeds, linseed (flaxseed) meal and rapeseed meal already take Crow Rates. Further, there is very little crushing of flaxseed in Western Canada. The amount is probably insignificant from a transportation point of view.

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[1] See for example CP Tariff, No. W-425-A: Rule 130.

Thus the "CNP rates for processed forms" alternative would really only involve the addition of some mixed feeds and rapeseed oil to the list of goods carried at CNP rates.

Mixed Feeds

Generally mixed feeds are prepared close to the point of final use. While this may be due in part to present freight rate policies, it is also because of the flexibility it gives feed manufacturers. Because of the variety of mixtures of raw products required for different classes and types of livestock feed (e.g. for dairy, poultry and feeder cattle) manufacturing and shipping of large amounts (carlot loads in the case of railway freight) is atypical. Further, final delivery is almost always by truck as railways do not access individual farms and feedlots directly. It therefore seems likely that, only part, if any of the mixed feeds, would move at CNP rates were these to be offered. What is much more likely is that existing feed manufacturers and feed users would argue for CNP rates on the raw grains for domestic use. This argument, in the author's opinion, is likely to prevail. Therefore estimation has proceeded on this basis.

In Table 12, feed use of grains was estimated at 13.5 million tons for the Prairie Region. Assuming that 20 percent of this amount is consumed directly on farms (having livestock) and allowing that 10 percent already move at Crow Rates (under existing mixed feed classification), it might be appropriate to consider the movement of the other 70 percent or 9.5 million tons by rail at CNP rates.

Under an assumption, that an average carlot load of feed grains would move about 300 miles and that the CNP rates would be different from market rates by the amount calculated using Equation 3 for this distance, then the total cost of this alternative for feed grains is estimated to be 67 million dollars.

Rapeseed Oil

In 1976 Western Canadian rapeseed crushing plant capacity was 3,600 tons or seed per day[1] of 720,000 tons per year. Plants are located at Nipawin and Saskatoon and Lloyminister in Saskatchewan, Altona in Manitoba and in Lethbridge and Sexsmith in Alberta.

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[1] Canada. Department of Regional Economic Expansion. "Vegetable Oil Processing in Western Canada, 1975". Saskatoon Regional Analysis Branch, January 1976, p.12.

The cost of applying CNP rates to rapeseed oil can be estimated by multiplying the annual volume of oil produced at each plant by the difference between Crow and market rates for movements between these plants and Thunder Bay (or Vancouver). This calculation has been made[1] and the results are presented in Table A-1.

Table A-1 shows that the total cost of this proposal is about $3.75 million. The costs are greatest at Lethbridge (on account of the high volume) and least at Saskatoon.

Conclusion

This proposal amounts only to the addition of some mixed feeds and rapeseed oil to the list of Crow Rate commodities. Flour, malt, some mixed feeds, linseed meal and rapeseed meals already travel at Crow Rates. The addition of these two commodity groups is estimated to add $70.75 million to (the unrecovered) costs of railway operations. $67 million of the increase is associated with the addition of mixed feeds, $3.75 million with rapeseed oil.

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[1] Equation 2 has been used as the basis for the calculation of market rates as it is thought that the volume of oil would be insufficient to justify the volume discount used for grains (Equation 3).

Table A-1: Western Canadian Rapeseed Crushing Plants, Capacity, Oil Production, Freight Rates And Cost Savings from Crow as Compared to Market Rates for Rapeseed Oil.

Crushing Plant Location	Annual Capacities[1]		Freight Rates[2]			Savings in Transportation Costs
	Seed Crush	Oil Production	Crow	Market	Difference	
	(000tn)	(000 lb.)		(¢/100 lbs.)		($ 000)
Altona	90	68	15	69	54	365
Lethbridge	200	150	22	86	64	960
Lloydminister	130	98	23	95	72	706
Nipawin	120	90	22	95	73	657
Saskatoon	60	45	22	94	72	324
Sexsmith	120	90	28	110	82	738
					TOTAL:	3,750

[1] Derived from "Western Oil Processing ..." report. op. cit.

[2] To Thunder Bay or Vancouver whichever is closer. Market rates on the basis of Equation 2.