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U.S./Canada Grain Handling and Transportation Systems

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Acknowledgments

The authors extend appreciation to Dr. George Flaskerud, Mr. Richard Taylor, Mr. Jeremy Mattson, and Dr. Roger Johnson for their constructive comments and suggestions. Special thanks go to Ms. Carol Jensen, who helped to prepare the manuscript.

The research was conducted under the U.S.-Canada agricultural trade research program funded by U.S. Department of the Treasury/U.S. Customs Service (Grant No. TC-00-001G, ND1301).

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Table of Contents

	<u>Page</u>
List of Tables	iii
List of Figures	iv
Abstract	v
Highlights	vi
1. Introduction	1
2. Differences in Grain Handling and Transportation Systems	8
2.1. Regulatory Structures	8
2.2. Geographic Scope of Country Competition	10
2.3. Grain Handling and Marketing	11
A. Grain Handling and Marketing Structure	11
B. Grain Handling, Shipping, and Marketing Practices	12
C. Prices Received by Farmers	14
2.4. Dynamic Changes and Investments in the GHTS	14
2.5. Summary	16
3. Canadian Transportation Mechanisms and Issues	17
3.1. Railroad	17
A. Rail Rate	17
B. Railcar Ownership	19
C. Railcar Allocation	20
3.2. Grain Trucking	23
3.3. Grain Handling and Export Logistics	26
A. Handling Costs and Cost Pooling	27
B. Cleaning Regulations and Practices	27
C. Export Logistics	30
4. Rationalization and Current Policy Issues in Canada	30
4.1. Reform Package	31
A. Revenue Cap and Rate Cap	32
B. Grain Roads	33
C. Grain Handling and Transportation Logistics	33
D. Safeguards	33
E. Branch Lines	34
F. Monitoring	34

Table of Contents (Cont.)

	<u>Page</u>
4.2. Primary Elevators and Efficiency	35
4.3. Railroad and Trucking	36
A. Abandonment of Rail Branch and Short Lines	36
B. Rail Deregulation	36
C. Trucking	37
4.4. Port Buying	38
5. Implications for Grain Trade	39
5.1. Changes in Grain Handling	39
5.2. Reciprocal Access to Marketing Functions	39
A. U.S. Grains Through Canadian Railroads	40
B. Cross Border Grain Movement: The Canadian Wheat Access Facilitation Program	43
5.3. Elimination of Rate Caps	46
5.4. Reform Package and Likely Future Paths for Canadian Rationalization	47
6. Concluding Remarks	47
References	50
Appendix	53
1. Manitoba Truck Types	55
2. Application Form for the State of Origin Certificate for In-Transit Grain Shipments	56
3. State of Origin Certificate - In-Transit	57
4. Request for Release Approval	58
5. Cargo Control Document	59
6. Participating Canadian Elevators of the Wheat Access Facilitation Program	60
7. Canada Customs Form B3	61
8. Canada Customs Invoice	62
9. Canadian Grain Commission Importer Declaration	63
10. Application Form for Phytosanitary Certificate for Export	64
11. USDA Phytosanitary Certificate	65

List of Tables

<u>Table No.</u>		<u>Page</u>
1	Structure of Grain Handling and Transportation in the U.S. GHTS	2
2	Structure of Grain Handling and Transportation in the Canadian GHTS	5
3	Regulatory Structure of the Canadian GHTS	9
4	Structural Comparisons in Grain Handling (Country Elevation)	11
5	Comparison Keys of Canadian and U.S. GHTS Performance Statistics	13
6	Handling Cost Comparisons Between Canada and the United States	13
7	Differences Between Country Prices for All Wheat and Barley, After Adjusting for the U.S. Export Enhancement Program, Saskatchewan, North Dakota, and Montana, 1984-1996	15
8	Estimated Annual Average Marketing Cost Inefficiencies for Saskatchewan, 1984-1996 and 1995-1996, Compared to North Dakota and Montana	15
9	Estimated Rail Transport Costs for Canadian Western Grain	18
10	Wheat or Barley Cleaning Costs and Returns for Canadian and U.S. Elevators	29
11	Some Known Inefficiencies in Western Canadian Grain Handling and Transportation	35
12	U.S. Grain Through Canada In-transit Program	41
13	BNSF and CP Rail Rates for Grain Shipments from North Dakota Origins to the U.S. West Coast Under the In-transit Program	42
14	Rates of Representative Barley Shipments	46

List of Figures

<u>Figure No.</u>		<u>Page</u>
1	The U.S. Domestic and Export Logistics of Grain	3
2	The Canadian Grain Handling and Transportation and Logistics Chain	6
3	Physical Elements of Canadian Logistics System, Average Time Load of Canadian Grain, and Costs	7
4	Canadian Railcar Allocation Zones by Railways	21
5	Canadian Railcar Allocation Process	22
6	Truck Rates Comparison Between Canada and the United States	23
7	The Canadian Rail and Trucking Rate Functions	25

Abstract

The United States and Canada have developed very different grain handling and transportation systems (GHTSs) over the last several decades to compete for global and domestic markets in Canada and the United States under CUSTA. Because the grain industries in both countries face long distance hauls, GHTSs are critically important to their operations and to producer returns.

There has been considerable pressure for change in Canada's grain handling and transportation sector. Some industry trends, such as the rationalization of elevators in the Prairies and investments in new high through-put facilities, are being driven by market and competitive forces. Changes in grain handling, reciprocal access to marketing functions, and elimination of rate caps may have a significant impact on cross-border grain flows.

Canadian Transport announced reforms to improve the efficiency of its GHTS. Possible multi-level effects, created by the reform package, would affect the grain flow from Canada to the United States. The most significant reforms include 'port buying' by the Canadian Wheat Board, which would remove the Board's control over internal logistics and shipping, and replacement of the current maximum railway rate scale with a cap on annual railway revenues for grain shipments.

Key Words: Canadian Wheat Board (CWB), Grain Trade, Grain Transportation and Handling System (GHTS), Rail Rate, Railcar Allocation, Rationalization, Rate Cap, Reciprocal Access, Regulation, Reform Package.

Highlights

Grain handling and transportation systems (GHTSs) are among the important issues of the agricultural agenda in the United States - Canada Free Trade Agreement (CUSTA). The two countries have developed very different GHTSs over the last several decades. In the United States, price signals and service competition throughout the system coordinate the vertical marketing functions and guide marketing and investment decisions. In Canada, the Canadian Wheat Board (CWB) has controlled the GHTS to regulate a single marketing and transportation system to support the CWB's export marketing monopoly. The CWB and other government agents in the industry allocate the key physical system resources such as grain deliveries, storage capacity, and railway cars. The Canadian GHTS is an administered system in which market price signals have been less effective and competitive pressures do not exist due to regulatory and administrative controls.

Recently the GHTSs in the two countries have rapidly developed to compete for global and domestic markets in Canada and the United States under CUSTA. It is important to compare the structure, regulatory practices, reforms, and efficiency of both GHTSs because they directly affect the competitive position of grain producers in each country; grain producers are highly dependent on rail transportation to move grains long distances to export ports. Under CUSTA, there is growing pressure to harmonize the GHTS and diversify delivery options.

The U.S. GHTS has experienced extensive deregulation with many marketing and transportation options and has evolved toward a commercial model within a competitive environment since the 1980s. As a result, investment, new technologies, and deregulation have brought substantial increases in the volume of grains shipped and decreases in railway freight rates. The Canadian GHTS is undergoing substantial changes based on the Estey Report and the Kroeger Report. On May 10, 2000, Canadian Transport announced the government's intention to introduce measures to increase efficiency and cut costs in Canada's GHTS. The reforms began on August 1, 2000.

Because the grain industries in both countries face long distance hauls, GHTSs are critically important to their operations and to producer returns. The Canadian and U.S. GHTSs are based on very different regulatory structures. In Canada, reforms have been implemented to increase efficiency and cut costs in their GHTS. In the United States, farmers and grain handlers are searching for higher grain prices, lower operating costs, and access of U.S. grains to Canadian markets.

The Canadian rail system is dominated by two rail carriers: the Canadian National (CN) and Canadian Pacific (CP). Both carriers have major lines with an east-west configuration, which facilitates shipments of grain from Prairie locations to Pacific ports or the Great Lakes and St. Lawrence Seaway. CP, which has ownership of the former Soo Line, has lines through North Dakota, Minnesota, and Wisconsin, giving it direct access to major U.S. consumption points for malting barley and wheat. CN, which owns the former Illinois Central, moves western Canadian and U.S. grain to ports on the Gulf of Mexico and to major U.S. consumption points.

The Canadian agricultural industry is heavily dependent on reliable rail service to compete in world markets. For grains, the long distances from the Prairies to major export ports and the bulky nature of the products give rail an inherent advantage over trucking. Although the average length of haul and rates for Canadian grain movement have decreased due to abandonment of branch lines during the last several years, the average length of haul and rate are still significant factors. Based on Canada's current infrastructure, approximately 85 percent of grain delivery points are within 50 miles of a competing railway. It suggests that trucking premiums and a large scale trucking program could be implemented to move grain between CN and CP and even to the main east-west Burlington Northern and Santa Fe (BNSF) line, which lies just south of the U.S. border. Large grain companies have the ability to truck between competing railways. The North American Free Trade Agreement (NAFTA) allows grain shipments from domestic to a transborder pattern.

The Canadian logistics system strives to operate on a 'just-in-time' basis. This system requires close cooperation among buyers, suppliers, and transportation providers; reliable rail service; efficient stock management at port terminals; and timely vessel arrivals. The smooth interaction of these factors is critical, but the current system for moving grain in western Canada is not designed to be efficient or customer focused. On May 10, 2000, Canadian Transport announced the government's intention to introduce measures to increase efficiency and cut costs in Canada's GHTS. The reform package contains six main components:

1. Replacement of the current maximum railway rate scale with a cap on annual railway revenues from grain;
2. Funding for Prairie grain roads;
3. Creation of a more commercial and competitive system for moving grain from country elevators to ports, which will be achieved through the expansion of tendering for CWB shipments to port;
4. Improvements to the Final Offer Arbitration (FOA) provisions of the Canada Transportation Act;
5. Improvements to the branch line rationalization process; and
6. Continuous monitoring and reporting by an independent private-sector third party to assess the impact of these changes.

Reciprocal access is the issue developed recently under the December 1998 *Record of Understanding with Canada*. The Canadian Food Inspection Agency (CFIA) simplified handling requirements for U.S. grain by accepting a certificate of origin instead of a Phytosanitary Certificate (with declarations for freedom from dwarf bunt, flag smut, and Karnal bunt) for grain that meets all of the following conditions:

- the grain originates in U.S. approved areas (Minnesota, Montana, and North Dakota);
- the grain will transit through Canada only by rail (in sealed hopper car);
- the grain will return to the United States; and
- the grain will not be unloaded in Canada.

Under the program, U.S. producers and shippers have better transportation access to final West Coast destinations in the United States. According to state officials, in-transit certificates have been issued for the movement of more than 1,580 million pounds and 1,420 million pounds of grain in 1999 and 2000, respectively. However, U.S. producers and exporters would like to have access to grain export facilities in the West Coast, mainly the port of Vancouver, under the same in-transit program.

In North Dakota, there are no large differences in rail rates from North Dakota to West Coast destinations between BNSF and CP (the former Soo Line Railroad). The elevator managers on the BNSF and CP lines use the in-transit program because of availability of railcars. The freight rate is consistent across the state for west bound shipments on both railroads but differs for east bound shipments. Elevators in the western and northern parts of the state ship more of their grain to West Coast destination than elevators in the east or southern parts of the state. Most elevators do not have access to both railroads so their choice of railroad is largely determined by their location rather than freight rates.

Access to Canadian primary elevators is vital for U.S. producers seeking to enhance opportunities for grain sales to Canada. The Canadian Wheat Access Facilitation Program (WAFP) improves access for U.S. grain producers and other sellers to Canada. Wheat producers from approved areas in Montana and North Dakota or grain handlers of wheat produced in those areas could benefit from WAFP. A producer selling wheat directly to a Canadian elevator needs to obtain a phytosanitary certificate. Prospective U.S. wheat producers or other sellers negotiate sales contracts with Canadian buyers covering price, quantity, quality, delivery, currency of payment, and other terms. Before admitting the wheat into Canada, Canadian Customs officers will verify the following documents:

- Canada Customs Form B3 for the identification of goods being imported;
- a Canada Customs or commercial invoice form;
- a Cargo Control Document or manifest in a format acceptable to Canada Customs;
- the Canadian Grain Commission (CGC) Importer Declaration; and
- a copy of a USDA phytosanitary certificate.

In addition to these required documents, there are more complicated and cumbersome requirements in the “Memorandum to the Canadian Trade Licensed Primary Elevators Handling U.S. Wheat.” Under the program started in 1999, no wheat has moved from the United States to Canada. To begin wheat export from the United States to Canada, it seems necessary to remove some of the CGC requirements.

Canadian Transport announced the reforms based on both the Estey and Kroeger Reports. Possible multi-level effects, created by the reform package, would affect the grain flow from Canada to the United States. The most significant reform is ‘port buying’ by the CWB. Port buying would remove the Board’s control over internal logistics and shipping, and replace the current maximum railway rate scale with a cap on annual railway revenues for grain shipments. However, it is notable that port buying is a concept promoted and described strictly with respect to executing off-shore export contracts. No reference has been made concerning trade within North America. These proposed changes are motivated by a desire to improve system efficiency through increased competition and accountability.

U.S./Canada Grain Handling and Transportation Systems

Joon J. Park and Won W. Koo*

1. Introduction

Grain handling and transportation systems (GHTSs) are among the important agricultural issues of the United States - Canada Free Trade Agreement (CUSTA). The Canadian GHTS is undergoing substantial changes based on the Estey Report¹ and Kroeger Report.² On May 10, 2000, Canadian Transport announced the government's intention to introduce measures to increase efficiency and cut costs in Canada's GHTS. The reforms are being implemented beginning August 1, 2000. It will be a highly dynamic competitive process with important implications for marketing and commercial policies.

This study provides an overview of the GHTSs in the United States and Canada with particular reference to grain trade between the two countries under CUSTA. Important features of the systems are identified and described, and issues associated with current grain transportation policies and agricultural commodity marketing are summarized and evaluated. The objectives of this study are to provide descriptions and policy implications of institutional features and trade practices, as well as background on recent and prospective policy changes. The likely impacts of institutional features and policies on grains under CUSTA, especially durum, hard red spring wheat, and malting barley are analyzed.

There are significant differences in the GHTSs between the United States and Canada. The two countries have developed very different systems over the last several decades. In the United States, price signals and service competition throughout the system coordinate the vertical marketing functions and guide marketing and investment decisions. In Canada, the federal government through national transportation legislation, the Canada Transportation Act (CTA), and the Canadian Wheat Board (CWB), administers the system.

The grain handling and transportation industry in the United States has been changed dramatically over the last two decades. There have been technological changes and productivity gains in the transportation system and substantial investment throughout the system. The system integrates a number of services and operates in response to market and price incentives to move grain from farm to

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¹The Estey Report is a comprehensive review of the efficiency of the transportation and handling system for Canadian Prairie grain. The report, submitted in December 1998, identifies 15 issue areas raised by stakeholders.

²Kroeger Report, working with industry stakeholders, has prepared recommendations on the changes necessary to implement a reform package with release in October 1999.

domestic and foreign markets (Wilson 1998 and USDA 1998). Rail, truck, and barge transportation facilitate a highly competitive transportation market. The competitive environment in the grain handling industry has passed enormous cost savings on to farmers and decision makers throughout the system (Parsons and Wilson 1999). Important key elements of the U.S. GHTS are shown in Table 1 and Figure 1. The U.S. GHTS includes storage and handling functions, car allocation and shipping, and export handling and logistics management.

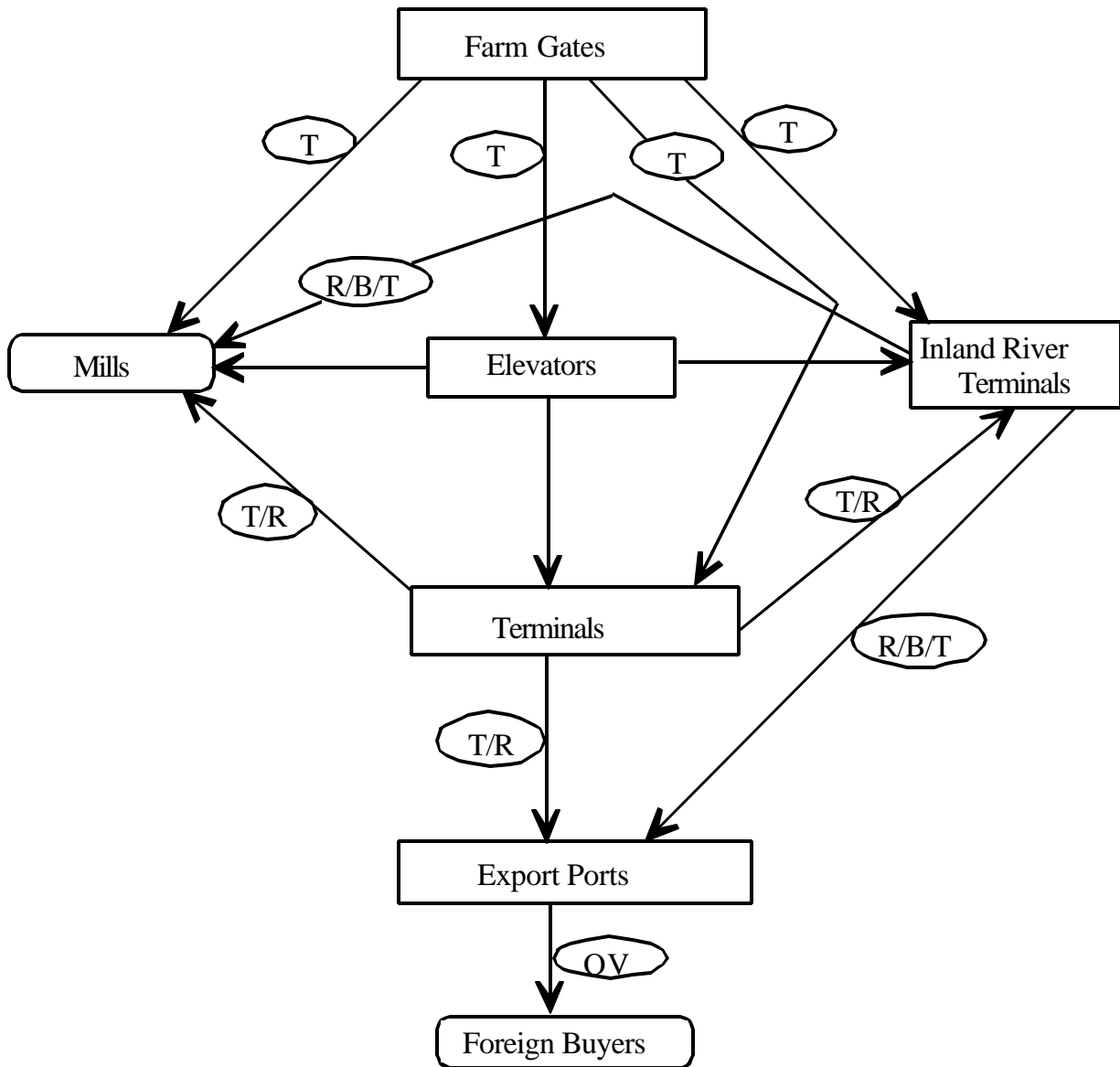
Table 1. Structure of Grain Handling and Transportation in the U.S. GHTS

Transport Service	Commentary
Farmers	Moves 63 million tons of wheat. Short truck delivery distances. Farmer paid at delivery.
Country collection	By truck and rail. Growth of short lines. Multiple delivery options.
Grain handling	Storage of over 150 million tons. Grain company owns elevators. Competitive with many large farmer-owned companies. Elevator size increased following deregulation.
Long distance	75% by rail and 25% by truck from North Dakota. Mode varies by destination. Shipments to west are 96% by rail, to Great Lakes 68% by rail.
Terminal handling & port service	Several options including West Coast (e.g., Portland, Seattle) and Gulf (e.g., New Orleans, Galveston), Great Lakes (Duluth). Multiple transportation choices for farmers.
System	Multiplicity of pricing options. Sustained investment in capacity and technology. Pricing and value programs drive efficiency. Creates value for all system participants.

Source: Parsons and Wilson 1999.

The GHTS in Canada is currently under reform. The second phase of the review has now been completed with release of the final report of the Estey Commission in December 1998. The Kroeger Report, released in October 1999, worked with industry stakeholders and prepared recommendations on the changes necessary to implement a reform. On May 10, 2000, the Canadian Transport Minister, the Minister of Natural Resources, the Minister responsible for the CWB, and the Minister of Agriculture and Agri-Food announced the government's intention to introduce measures to increase efficiency and cut costs in Canada's GHTS (<http://www.tc.gc.ca/>). The reforms began on August 1, 2000.

Figure 1. The U.S. Domestic and Export Logistics of Grain



Key: T=Truck B=Barge R=Rail OV=Ocean Vessel

Price signals and service competition coordinate the vertical marketing functions and guide marketing and investment decisions in the United States. This process occurs throughout all elements of the U.S. GHTS. Price signals have always played an important role in fundamental storage decisions (i.e., timing of marketing decisions are influenced by intermonth price spreads). Through competitive pressures, price discounts have induced development of larger scale elevators and shipments, and have provided incentives for farmers to ship longer distances. These signals and competitive pressures influence storage decisions, the timing of shipping decisions, investment decisions in railcars and infrastructure, and assure efficiencies (Wilson 1998).

The Canadian GHTS is an integrated system involving primary elevators, railways, terminal elevators, and export ports, in which regulations play an important role in marketing decisions. Figure 2 and Table 2 show the Canadian grain handling and transportation logistics chain and its regulatory framework and structure. The CWB regulates and controls grain movements from farms to export ports and the Canadian Grain Commission regulates quality and country handling tariffs. The Canadian government has progressively moved away from regulation and central controls to provide greater scope for normal commercial decision making. Recently, major changes are being made to reduce the level of regulation and subsidization and to operate in a more commercial and market-oriented environment.

The CWB is a single-desk seller for all wheat and barley for human consumption (e.g., malting) and export. All other grains and grain products are marketed competitively by grain companies, cooperatives, and producers. The CWB plays a key role in getting its grain to export ports, but does not own or operate any elevators. The CWB relies on grain companies and cooperatives to handle grain from originations to export destinations. The overall performance of Canada's GHTS is heavily influenced by the CWB, which handles over 60 percent of all grain shipments. Because grains and oilseeds are transported long distances to export points, producers are highly dependent on rail transportation. Before August 1, 1995, policies were in place to subsidize grain transportation charges and guarantee protection against railway non-performance. However, the Western Grain Transportation Act (WGTA), which set freight rates along with service and infrastructure levels, was removed in 1995, resulting in immediate doubling of freight charges paid by producers in some areas.³ Furthermore, the removal of the WGTA also meant the removal of most restrictions on branch line abandonment.

³Between 1994-95 and 1995-96 crop years, weighted average deductions from farmers for freight increased 146, 118, and 153 percent for wheat, durum, and barley, respectively (CWB, *Statistical Tables* 1998, 18).

Table 2. Structure of Grain Handling and Transportation in the Canadian GHTS

Transport Service	Characteristic	Significance
Farmers	<i>Widely dispersed across the Prairies</i>	80% of grain to CWB monopoly buyer with many farmers (100,000+) who must market export wheat and barley through the Canadian Wheat Board (CWB). Deliveries managed by the CWB through contract calls and permit books. CWB export grains account for 84% of total Prairie exports (22.3 million tons) with the balance in non-Board grains (4.2 million tons -16%).
Country collection	<i>Short distance movement</i>	Grain moved off farm by truck to country elevators. Further country movement is by truck and by railway branch line and short line railways to mainline train assembly points. Truck movements have been short (10 - 20 miles) but have increased with branch line closure and grain company economic incentives to attract grain to inland terminals.
Grain handling	<i>Increasing competition</i>	Handling tariffs are not regulated but monitored by the Canadian Grain Commission, who also issues elevator operating licenses. Elevators can only receive CWB grains for movement on the regulated system. Three major Canadian companies that have developed from four provincial cooperatives. (UGG, SWP, and Agricore account for 68% of the current Prairie handling capacity). Other companies (Pioneer, Paterson, Parrish and Heimbpcker, and other smaller, often farmer-owned) account for the remainder of capacity. In total, there are some 1,104 country elevators. U.S. companies have become major players in the country collection system. Cargill entered decades ago but has been joined more recently by Archer Daniels Midland, ConAgra, and the French company Louis Dreyfus.
Long distance	<i>Government rate and service regulation</i>	Mainly by rail at statutory maximum rates based on cost estimates of movement set in the Canada Transportation Act. Two major railways - Canadian National Railway and Canadian Pacific Railway. Distances moved are often in excess of 1,000 miles. Movements are mainly in the form of mixed trains with a minority of unit trains. Trains are commonly characterized by multiple origins in the country, multiple terminal destinations at port, and multiple grades of grain and other commodities.
Terminal handling	<i>Administered market</i>	High levels of corporate concentration with little competition since terminal deliveries reflect company country collection performance and further allocation and delivery instructions from the CWB.
Port services	<i>Recently privatized</i>	Three major ports are Vancouver and Prince Rupert on the West Coast and Thunder Bay at the Lakehead. Border crossings to the United States account for 15% of the total movement. There are small movements through Churchill. Port movements are highly regulated through port union labor agreements that closely control working hours and shift changes.
System	<i>Efficiency</i>	Widely recognized as inefficient. Many bottlenecks and system constraints including multiple origins and destinations, car allocation, limited use of most efficient elevators and unit trains, grade mix ups, excess tough and damp storage, impurities in grain, high demurrage.
	<i>Information</i>	Logistics information and requirements generated through committees.

Source: Parsons and Wilson 1999.

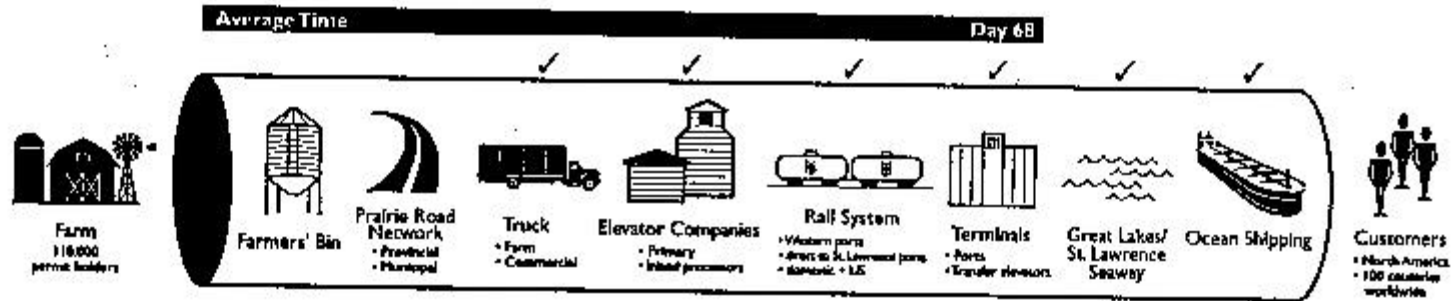
Farm Production & Storage	Country Collection by Truck and Rail	Country Elevation & Storage	Long Distance Movement	Terminal Elevation	Port Handling
Widely Dispersed	Short Distance Movements	Widely Dispersed Small Scale	1,000 miles+ Mainly Rail	Cleaning Grading	Loading Vessels
REGULATORY FRAMEWORK					
Canada Transportation Act					
<i>Statutory Freight Rates and Caps - Cost Based Rates - Branch Line Exit Controls</i>					
Canadian Wheat Board					
<i>Permit Books - Contract Calls - Elevator Collection - Car Allocation - Freight Adjustment Factors - Terminal Delivery</i>					
Canadian Grain Commission					
<i>Licensing Elevators - Country Grain Grading - Terminal Grain Grading - Licensing Tariffs - Quality Inspection</i>					
Provincial Governments					
<i>Rural Road and Highways - Provincial Railway Legislation - Road and Rail Taxation</i>					

Figure 2. The Canadian Grain Handling and Transportation and Logistics Chain

Source: Parsons and Wilson 1999.

Canadian grain spends an average of 68 days in the logistics pipeline from the farmer's bin to port position (40 days in storage at the country elevator, 12 days in transit to the port, and 16 days in terminal elevator storage) (Figure 3). There is considerable variation in time spent in the logistics pipeline, particularly in the lead time from ordering cars for loading and unloading time at export ports (WESTAC 1998, 9). Uncertainty in lead times makes planning and management difficult for all system participants (farmers, grain companies, railways, CWB, and federal and provincial governments). Logistical uncertainties also affect customer perceptions about the reliability of the Canadian system. Canada's GHTS has caused a significant disadvantage in offshore markets (McKinsey & Company 1998, 13). Logistics costs are the largest input cost for grain and are typically in the range of \$60-80 per ton (WESTAC 1998) in Canada. Large volumes (around 27 million tons) are exported each year, originating at various production points across the Prairies. The St. Lawrence Seaway route through Thunder Bay was once the main grain export route, but growing Asian markets have currently made Vancouver and Prince Rupert the major export ports (61 percent of bulk grains, 56 percent of bulk barley, and 37 percent of malting barley) (Park, Johnson, and Wilson 1999).

✓ operating costs assessed against movement



Cost Components	% Share
Marketing	3
Truck	7
Primary	17
Rail	56
Terminal	17

Figure 3. Physical Elements of Canadian Logistics System, Average Time Load of Canadian Grain, and Costs

Source: WESTAC 1998, 9.

Because of the long distances to ports and the export orientation of the grain industry in both countries, GHTSs are critically important to their operations and to producer returns. The Canadian and U.S. GHTSs are based on very different regulatory structures. In Canada, grain handling and transportation reforms have been implemented to increase efficiency and cut costs. In the United States, farmers and grain handlers are searching for higher grain prices, lower operating costs, and access of U.S. grains to Canadian markets. Recently the GHTSs, on both sides of the border, have changed rapidly to countervail the price fall from the peaks reached in the 1995/96 (U.S.) and 1996/97 (Canada) crop years. The two countries are competing with each other for domestic markets in Canada and the United States under CUSTA and for the global market. It is important to compare the structure, regulatory practices, reforms, and efficiency of both GHTSs because they directly affect the competitive position of grain producers in each country. Under CUSTA, there is growing pressure to harmonize the GHTSs and diversify delivery options.

2. Differences in Grain Handling and Transportation Systems

Parsons and Wilson (1999) compared the GHTSs of the two countries and identified salient differences by eight categories: regulatory structures, grain handling and marketing competitive system, geographic scope of country competitions, grain handling, shipping and marketing practice, marketing and handling costs, dynamic changes in the GHTS, investment in grain handling and transportation, and prices received by farmers. In this study they are recategorized into four: regulatory structures, geographic scope of country competitions, grain handling and marketing, and dynamic changes and investments in the GHTSs.

2.1. Regulatory Structures

The U.S. GHTS has experienced extensive deregulation with many marketing and transportation options and has been evolving toward a competitive commercial model since the 1980s. The escalation of rail shipping options after deregulation has provided an increase in number of shipment size and service options. With the passage of the Railway, Regulatory Reform and Rehabilitation (4R) legislation in 1976 and the 1981 Staggers Act, the United States moved from the micro management of railway rate through the government intervention to application of market competitive pressures on rates and services. As the result, investment, new technologies, and deregulation have brought substantial increases in volume of grains and decrease of railway freight rates.

In Canada, the CWB controls the GHTS to support its export marketing monopoly. The CWB and other government agents in the industry allocate the key physical system resources such as grain deliveries, storage capacity, and railway cars (Table 3). All of these regulatory interventions affect prices and performance of the Canadian GHTS. The federal government under the CTA administrates the shipping costs subject to a price cap. In recent years a large number of operating problems have occurred across the Canadian GHTS. To solve the problems and increase efficiency of the system, the special grain provisions of the CTA were reviewed in 1999 and the Canadian government announced in May 2000 its intention to introduce measures to increase efficiency and cut costs.

Table 3. Regulatory Structure of the Canadian GHTS

Transport Service	Regulatory Authority	Commentary
Farmers	CWB, CTA, Provincial Governments	The CWB controls deliveries through permit books and contract calls. The CTA regulates prices and service availability on branch lines. Provincial governments manage road maintenance and construction and license trucks. Farmers are paid 80% as initial payment by the CWB at time of delivery (except malting barley). Balance paid some 6 to 12 months later after final sale price has been received and all marketing, handling, and port deductions are made by the CWB.
Country collection	CWB, CTA, Provincial Governments	The CTA places maximum prices on branch line rail movement. The CWB calls grain into the system. Provinces license trucks and construct and maintain rural road systems.
Grain handling	CGC	The Federal Grain Commission licenses elevators and monitors prices, which were deregulated several years ago. Competition is growing in country elevator pricing, often through the use of trucking premiums.
Long distance movement	CT, AAPG, CWB	Regulated through statutory maximum price cap and distance related, cost based rates. Branch line abandonment procedures streamlined but still regulated. Car allocation through a regulatory committee CAPG, the Car Allocation Policy Group, involving the CWB, railways, grain companies, and producers.
Terminal handling	CGC, CWB	Terminal facilities licensed by the CGC. Terminal deliveries reflect country collection performance on the basis of a CWB/Grain Companies Agreement.
Port services	Canada Port Act	In transition towards privatization through the creation of community port authorities with federally chartered local monopolies.
System	Provincial , Fiscal, Highways, Railways, Federal	Federal and Provincial taxes levied differentially on road and rail taxes creating export taxes on grain movements, 15 Provinces responsible for road maintenance and upgrading. Provinces responsible for short line railway legislation. Federal Government also responsible for short line railway legislation.

Source: Parsons and Wilson 1999.

Regulatory structures for the GHTS that have profound influences on operations, competitiveness, and efficiency of the two systems include:

The CWB and government agents in Canada physically allocate transportation, handling, and marketing services while the United States allocates the economic resource through the price system.

- The Canadian structure controls the GHTS through cost-based rail price and physical resource allocation, with the goal of equity (equal access), in contrast to objectives for regulation that aim to create a competitive environment in the United States for a wide variety of marketing, handling, and transportation options.
- Rigidities in the Canadian system from regulations, often entrenching past practices, in contrast to flexibility in the U.S. GHTS to accommodate changes in the industry and new technology.
- The CWB, excluded from the Canadian Competition Act, effectively removes the Canadian system from federal competitive controls, in contrast to legally enforceable commercial contracts, agreements, tariffs, and competition law in the United States.

In summary, the Canadian GHTS is an administered system in which important market price signals have been removed and competitive pressures reduced through regulatory and administrative controls. In contrast, the U.S. regulatory system has focused on creating a competitive environment in which prices are used to allocate resources.

2.2. Geographic Scope of Country Competition

A fundamental difference exists in the geographic scope of competition between the Canadian Prairies and the Northern tier of the United States. This difference would have important implications for the relevance of comparisons, as well as the expected post-deregulation competition. Specifically:

- the percent of farming locations within 37 miles, a reasonable trucking distance to the two major railways (Canadian Pacific Railway and Canadian National), are 85 percent for Manitoba, 74 percent for Saskatchewan, and 52 percent for Alberta in Canada; and
- the average distance from elevators to elevators located on a competitor railway is 116 miles in Montana, while the comparable measures in the Prairie provinces are 21 miles for Manitoba, 26 miles for Saskatchewan, and 43 miles for Alberta.

Thus, the basic Canadian geography in the Prairies gives more potential competition between two railways, Canadian Pacific (CP) and Canadian National (CN), and among country elevators for grains than in Montana. In recent years, elevator companies in Canada have increasingly offered trucking premiums due to the competition and in order to increase their grain volume.

2.3. Grain Handling and Marketing

The U.S. GHTS has more intense competition than the Canadian GHTS. This competition has led to a large number of efficiency incentives to improve service and realize operating savings. These are widely used in the U.S. system and are little used in Canada.

A. Grain Handling and Marketing Structure

One of the more important differences is the structure of the grain handling sector. Both Prairie Canada and North Dakota have cooperatives that handle a large share of grains. In Canada, companies originating as provincial pools dominate grain handling. This is also true in North Dakota with a large number of farmer-owned cooperatives. In Montana, grain handling cooperatives co-exist and compete with large private firms. However, grain handling services are far more concentrated in Canada than in the United States. The largest company accounts for over half of the number of elevators in each Prairie province compared to 8 percent in North Dakota and 22 percent in Montana.

Canada's system is substantially more concentrated than that in the Northern tier states. The Herfindahl-Hirschman index⁴ indicates that levels of corporate concentration in grain handling are almost three times as high in the Canadian Prairies as in Montana. Table 4 summarizes these key differences in competitive structure. Regulatory and administrative practices to some degree have reinforced the Canadian concentrated corporate structure. Increased trucking and grain company restructuring may introduce more competition into the system.

Table 4. Structural Comparisons in Grain Handling (Country Elevation)

	Manitoba	Saskatchewan	Alberta	North Dakota	Montana
Number of Companies	15	26	11	260	73
Corporate Concentration					
Market share of largest 4 firms	88%	89%	92%	16%	43%
Herfindahl-Hirschman Index	3,124	2,834	3,513	159	1,088

Source: Parsons and Wilson 1999.

⁴The Herfindahl-Hirschman index is the sum of squares of the market shares of the firms in the industry: $H=s_1^2+s_2^2+s_3^2+...+s_N^2$. The index is a useful indicator of concentration: the larger the Herfindahl-Hirschman index, the fewer the number of firms dominating the industry (Mansfield 1990).

B. Grain Handling, Shipping, and Marketing Practices

Differences in handling and marketing practices are partly a result of the structure and regulations affecting the industries in both countries. Handling and shipping practices are (Table 5):

- Average storage capacities of elevators in the Northern tier of the United States are over twice as large as those in the Canadian Prairies;
- Grain storage in the U.S. system (including on-farm and off-farm, as well as at ports) is much higher than in Canada, providing the capacity to meet surge demands;
- In the United States, about 40 percent of spring wheat shipments are shipped by unit train (single origin/single destination), and the destination of more than 70 percent of them is the Pacific Northwest ports. This contrasts with less than 25 percent of the shipments from Canadian Prairie elevators at multiple car rail incentive rates. Only part of these shipments are unit train movements. Western Canadian grain shipments are largely from multiple origins to multiple destinations;
- Waiting times for vessels at the ports in Vancouver are three times larger than those in the United States.

Taken together, the U.S. system has greater capacity to ship large volumes in relatively shorter periods of time, compared to the Canadian system.

Marketing costs in the United States are substantially less than those in Canada, and have been declining in real terms since the early 1980s. A comparison of handling costs for various functions in each country is summarized in Table 6. It is particularly important to note that in the United States, cleaning costs are not charged to farmers, but grain handlers offset the cleaning cost with the transport savings and by the sale values of screenings. In Canada, grain handling services, including cleaning costs, are charged on all CWB grains entering the system, irrespective of the extent of cleaning or offsetting savings in marketing costs.

Table 5. Comparison Keys of Canadian and U.S. GHTS Performance Statistics

Item	Year	Canadian Prairies*	United States North Dakota (ND) Montana (MT)
GHTS Storage (millions of tons)	1998	12	163
Farm and GHTS storage capacity as % of production (Prairie farm measured as stocks)	1997	25%	29%-53%
Average size of elevator (thousand of tons)	1998	6.5 (Prairies)	15.6 (ND) 10.8 (MT)
Share of country locations with multi car loading facilities	1997	17%	44% (ND)
Share of grain shipped at multiple rates	1996	25%	70% (ND)
Average grain car cycle times (days)	1994	18	20 (ND)
Average age of railcars (years)	1998	20 (federal fleet)	11 (BNSF)
Ratio of country storage to port storage	1997	2.6:1	13:1
Ratio of port shipment to port storage	Average (1995+1996)	13 (B.C.)	29 (Gulf) 27 (PNW)
Average vessel waiting time at port (days)	1996	12 (B.C.)	4 (Gulf)

Source: Parsons and Wilson 1999.

*Prairies include the Peace River District in British Columbia.

Table 6. Handling Cost Comparisons Between Canada and The United States

	Canada		U.S.		Canada as % Difference from U.S.
	C\$/mt	US\$/mt	C\$/mt	US\$/mt	
Country elevation	10.35	5.51	5.25	2.94	+0.97
Terminal elevation	7.69	4.04	1.84	1.10	+3.18
Cleaning	3.40	1.84	2.29	1.10	+0.48
Total	21.44	11.39	9.38	5.14	+1.29

Source: Parsons and Wilson 1999.

C. Prices Received by Farmers

The U.S. GHTS has yielded higher returns to wheat and barley farmers in North Dakota and Montana than Saskatchewan farmers received from the Canadian system. Ultimately, the marketing systems, inclusive of handling and shipping, serve farmers efficiently in the United States. The cumulative effects of these systems affect prices received by farmers. Between 1984 and 1996, the prices received by Saskatchewan farmers for CWB wheat and barley were lower in most years than those received for comparable grains in Montana and North Dakota. In 1995 and 1996, farmers in Montana and North Dakota received from C\$25/ton to C\$45/ton more for wheat and barley than similar grain farmers in Saskatchewan even though Canada allegedly receives a CWB marketing premium relative to U.S. grains and rail rates on grain to export ports from Montana and North Dakota exceed those from the Prairies.

The net effect of the operating differences in the Canadian and U.S. GHTSs' performance reflects the respective efficiencies of the two systems. That is, price differences between the two countries are a reflection of the combined efficiency of their respective country's collection, handling and cleaning, long distance rail shipping, port fobbing, marketing, and other related activities. If both the western Canadian and U.S. GHTSs were equally efficient, then farm prices would simply reflect differences in rail rates that favor the Canadian farmer. However, this is not the case when competitive, regulatory, and efficiency factors are introduced in the system.

Between 1984 and 1996, an efficiency loss in the Canadian GHTS for Saskatchewan farmers reflected the difference in the prices received by farmers. By 1995/96, the price difference grew as high as \$36.28 for Saskatchewan wheat relative to North Dakota and \$45.31 for Saskatchewan barley compared to Montana (Table 7). These differences translate to an annual average economic *Marketing & GHTS Efficiency Loss of \$137 million* against North Dakota's GHTS efficiency and \$147 million against Montana's GHTS efficiency (Table 8). In 1995, when the U.S. Export Enhancement Program (EEP) was winding down, and in 1996 when it was not present and there were widespread reports of inefficiencies and problems in the Canadian grain handling system, the transportation efficiency loss for Saskatchewan increased to \$415 million against Montana and \$505 million against North Dakota.

2.4. Dynamic Changes and Investments in the GHTS

Dynamic inter-dependent relationships throughout the U.S. system have generated efficiencies, in contrast to a large number of logistical inefficiencies in the Canadian system. Railway regulation, pricing, and dynamic interaction with the rest of the GHTS is found to be central to efficiency gains in the United States. While deregulation in the United States led to price changes throughout the GHTS, prices of the handling, rail, and port services have moved in different directions in Canada. There have been decreases in real rail rates over time in both countries. However, their time paths have differed substantially.

Table 7. Differences Between Country Prices for All Wheat and Barley, After Adjusting for the U.S. Export Enhancement Program, Saskatchewan, North Dakota, and Montana, 1984-1996

Comparison Period	Saskatchewan Farm Price Less North Dakota Farm Price		Saskatchewan Farm Price Less Montana Farm Price	
Annual Average	Canadian \$/mt		Canadian \$/mt	
	Wheat	Barley	Wheat	Barley
1984-1996	-9.27*	- 10.29*	-7.31 *	-28.57*
1992-1996	-21.26*	- 15.80*	-12.39*	-38.10*
1995-1996	-36.28	-25.51	-26.04	-45.31

* Includes adjustment for the U.S. Export Enhancement Program.

Source: Parsons and Wilson 1999.

Table 8. Estimated Annual Average Marketing Cost Inefficiencies for Saskatchewan, 1984-1996 and 1995-1996, Compared to North Dakota and Montana (Adjusted for the U.S. Export Enhancement Program)

Based on	North Dakota	Montana
1984 - 1996	\$137 million	\$147 million
1995 - 1996	\$505 million	\$415 million

Source: Parsons and Wilson 1999.

- In the Canadian Prairies, rail rates regulated under the WGTA, the National Transport Act (NTA), and the CTA increased through most of the 1980s and then fell after 1993.
- In the United States, rail rates fell sharply in real terms following deregulation in 1980, and continued to fall throughout the post deregulation period. The initial effect on rate reductions ranges from 2 percent to 19 percent (varying across grains). By 1995, the cumulative effects of deregulation on rail rate reductions ranges from 42 to 55 percent.

The specific process of deregulation in the United States allowed railroads to operate more efficiently and resulted in more efficient shipping practices, thereby reducing costs and ultimately reducing rates. The reduced rail rates were pervasive throughout the system.

U.S. pricing structures have allowed for sustained investment in capacity and new technology, while government investment has remained important in Canada. Critical criteria for evaluating competition and regulation include the extent that returns are sufficient enough to induce investments. This is important for farmers since investments in capacity enhance the ability to market grains over shorter time periods in response to market opportunities.

- In the United States, returns to grain shipping have been sufficient to induce investments throughout the system by the private sector. For example, the Burlington Northern Santa Fe (BNSF) railroad averaged \$2 billion (US) per year in capital expenditures and invested nearly \$500 million in their grain business in 1996 and 1997. These investments included double tracking and siding, locomotives, and hopper cars. While other railroads' investments vary, all have invested in expanded rolling stock over the past few years.
- In contrast, many of the investments in grain related businesses in Canada have been associated with government interventions of various types. These have included rehabilitating rural branch lines, port storage and handling, and federal and provincial government hopper car purchases that today account for about 70 percent of the grain hopper car fleet.
- Prices generated in the marketplace have provided for sufficient returns at all stages of the system in the United States to encourage investments in response to market conditions. Through the 1980s and 1990s private investment in the U.S. system contrasts with the substantial public investment in the Canadian GHTS.

2.5. Summary

This comparison of the Canadian and U.S. GHTSs found that the differences between systems carry a large economic cost for farmers and governments. These costs were estimated for Saskatchewan to have reached as high as one-half billion Canadian dollars annually in 1995 and 1996. Many of the system differences would seem to contravene the spirit of Canada-U.S. cooperation and freer continental trade. In the years ahead, there will be growing pressure to harmonize the system and increase delivery options at lower costs and increased value for all North American farmers.

According to a study, Parsons and Wilson (1999), the Canadian and U.S. GHTSs are based on very different regulatory structures that understandably have different effects on system efficiency. In western Canada, the closely controlled administered market offers higher costs and lower economic returns to farmers, but also incorporates long standing equity objectives. In the United States, competitive regulation since the 1980s has delivered large efficiency gains throughout the GHTS that have been reflected in higher prices for wheat and barley in North Dakota and Montana compared to Saskatchewan. Prairie farmers and the Canadian federal government must consider closely the advantages and disadvantages of both systems.

3. Canadian Transportation Mechanisms and Issues

The Canadian rail system is dominated by two rail carriers: the CN and CP. CN, formerly owned by the federal government, was privatized in 1995. Both carriers have major lines with an east-west configuration, facilitating shipments of grain from Prairie locations to Pacific ports (Vancouver or Prince Rupert) or the Great Lakes and St. Lawrence Seaway. The main CP lines are generally south of the CN lines in the Prairies. Both carriers also have rail lines or hauling rights in the United States. CP, through ownership of the former Soo Line, has lines through North Dakota, Minnesota, and Wisconsin, giving it direct access to major U.S. consumption points for malting barley and wheat. CN, through ownership of the former Illinois Central, moves western Canadian and U.S. grain to ports on the Gulf of Mexico and major U.S. consumption points. CN is also moving grain directly by rail into Mexico with its marketing alliance with KCS (Kansas City Southern) (Canadian National Railroad 2000).

In the 1980s, a number of important grain marketing events were initiated and the federal government changed policy toward privatization and deregulation. The stabilization program affecting production and marketing is used for regulation and is involved with expenditure of public funds. The CTA of 1996 made it possible for new short line railways to be formed (Baylis, Fulton, and Gray 1998). However, these are in an early stage of development and do not diminish the relative importance of CN and CP in grain transportation. Concerns about the market power of the two main carriers have been raised in discussions about the removal of rate caps.

3.1. Railroad

A. Rail Rate

While the NTA of 1987 and the CTA of 1996 deregulated most railway movements in Canada, western grains remained an exception. Rate caps apply for grain movements; these caps are generally cost-based and related to distance. The Canadian agricultural industry is heavily dependent on efficient rail service to compete in world markets. For grains, the long distances from the Prairies to major export ports and the bulky nature of the products give rail an inherent advantage over trucking. Although the average lengths of haul and rates for Canadian grain movement have decreased due to abandonment of branch lines during last several years, the average length of haul and rate are very significant factors in Canadian grain movement (Gravelines 1997). The 1998 average length of grain haul is 958 miles and shipping cost is C\$25.79 per ton (Table 9). The logistics environment has been strongly influenced by rail rate regulation dating back a century (Crow Rate) and centralized, government-controlled marketing. Canadian grain shippers have been treated differently than other shippers because of long distances to markets, the bulky nature, relatively low value of the product, absence of alternative modes of transportation such as barges in the Mississippi river system, widely dispersed shipping points, and presence of only one serving railway at many locations.

Table 9. Estimated Rail Transport Costs for Canadian Western Grain

Year	Average Length of Haul (miles)	Cost (C\$)/ton	Cost (C¢)/mile
1992	1,023	31.50	3.079
1993	1,046	31.04	2.967
1994	1,012	29.28	2.893
1995	992	28.24	2.849
1996	971	27.25	2.806
1997	977	26.70	2.733
1998	958	25.79	2.692

Source: Canadian Transportation Agency, *A Report on the Movement of Western Grain*, 1999.

Changes in the WGTA increased rail shipping costs paid directly by shippers (previously, a portion was paid directly by the government of Canada to the railroads). The rail freight tariff regulation, which had governed the movement of all rail freight for more than a century, was repealed in 1988 and now all movements in Canada, other than western grain, are based on rates established by contracts between the railway and the shipper. Western grain was regulated under the “Crow Rates” and later the WGTA. Since the WGTA was repealed in 1995, railway freight rates for western grain have been regulated by tariff freight rates governed by a rate cap (Estey 1998b, 30).

“The rate cap is the maximum rate which may be recovered by the railway for grain movements over 25-mile blocks and is used by the railways to develop freight rates for each of the possible origin/destination pairs on the western rail system” (Estey 1998b, 30). The rate cap applies to both non-Board grain and Board grain on all rail lines west of Armstrong, Ontario, excluding rail lines leading to export destinations in the United States. The British Columbia Agricultural Council has drawn attention to the fact that while the rate cap applies to the transportation of feed grains to the export market, it does not apply to the transportation of feed grain for Canadian domestic use.

Since the advent of the rate cap, freight rates for western grain have risen 9.3 percent as of the 1997-98 crop year. These rates fell back slightly for the 1998-99 crop year (Estey 1998b, 30). Freight rates to the western farmer are significant since transportation by rail is the largest single cost in the production, handling, and movement of grain to export ports. For example, in recent years rail transportation represented about 40 percent of all the costs of production, handling, and transportation of wheat from the farm to the offshore customers’ locations (Estey 1998b, 30).

B. Railcar Ownership

From 1972 to 1986, the Canadian federal government acquired 14,000 hopper cars for the grain handling fleet in western Canada. During the same period, the CWB acquired, by purchase and long-term lease, 4,000 hopper cars, and the provinces of Alberta and Saskatchewan acquired another 2,000 cars for the same purpose. These cars are provided to the two railways, CN and CP, in about equal numbers and are used, with some exceptions, entirely for hauling grain. Since the cars are provided to the railways without charge, the cost base of the current regulated rate scale does not reflect any allowance for the ownership cost of these cars (Estey 1998b, 27).

When the Canadian federal government announced in February of 1995 that the WGTA was to be abolished, it was also announced that they intended to sell the fleet of 13,000 hopper cars that they had acquired over the previous two decades. Producer groups have indicated that the hopper cars should be sold to them rather than to the railways. In March 1996, it was announced that the railcars were available for sale. Any party purchasing the cars must make appropriate operating arrangements before the party's bid is considered. The purchasing group would be awarded a \$0.75 per ton surcharge on grain shipments by the car fleet for an indefinite time period to help offset the cost of owning the cars, beginning with the 1998-99 crop year (Vercammen, Fultom, and Gray 1996.).

The sale of 13,000 hopper cars owned by the government of Canada raised ownership issues in 1998: to whom should these cars be sold in the interest of efficient transportation service? A coalition, owned and controlled by producers, had expressed an interest in purchasing these cars. Ownership of cars would allow producers to enter into policy discussions concerning the employment of hopper cars. Other stakeholders have expressed their view that ownership of cars does not have much, if any, influence on the actual operations of the car allocation system. The desire to acquire these cars is strongest among producer groups (Estey, 1998b).

Vercammen, Fultom, and Gray (1996) stated regarding car ownership by producers:

“Producers will benefit from car ownership if, as a result of their ownership, they are able to negotiate lower freight rates for grain movements. This scenario has important implications if the current freight cap is abolished as a result of the 1999 review of the current legislation. The extent to which a producer railcar coalition would be effective when bargaining with the railways is highly uncertain.”

C. Railcar Allocation⁵

Car allocation is important because there is a transportation capacity constraint during every crop year. Usually in a deregulated system, rates are determined by demand and supply of railcars for grain shipments. However, in the Canadian grain transportation system, non-price mechanisms allocate the limited transportation services among those who demand them. Car allocation policies have changed numerous times during the last few decades roughly as follows:

Pre-1969	Bulk allocation
1969	Block shipping
1976-77	Train run allocation
1993-94	Space cars
June 1997	20% Performance allocation
November 1997	25% Performance allocation
September 1998	Zone allocation

In September 1998, the CWB moved from a train run allocation system, based on handling percentage and performance, to a zone allocation system. Under the new system, the CWB allocates to a wider geographic area instead of allocating railcars to the grain companies along train tracks (CWB, October 1998).

In November 1995, the senior executive officers of the grain industry developed a proposal to suggest that the CWB allocate railcar orders by zone rather than the train run program. In October 1998, zone allocation replaced the previous train run allocation system. Under the old system, the CWB allocated its share of the total car supply to grain companies along one piece of train track, known as a train run. Under the zone allocation system, railcars are allocated to zones which are larger geographical areas comprised of 10 to 20 train runs (Figure 4). Within these areas, the elevator companies, not the CWB, decide which elevators will receive railcars for loading. The CWB retains its critical role in transportation and still ensures the right grain gets to the right place at the right time to meet sales requirements. Zone allocation is designed to provide the opportunity for system efficiencies resulting from direct allocations and reduced cycle times to be passed on to farmers through cost reduction and incentives (CWB, *Zone Allocation*, 1998).

⁵This section is a survey of material contained in CWB (1998) *Grain Matters, Zone Allocation*, and *Car Allocation 1998-99*.

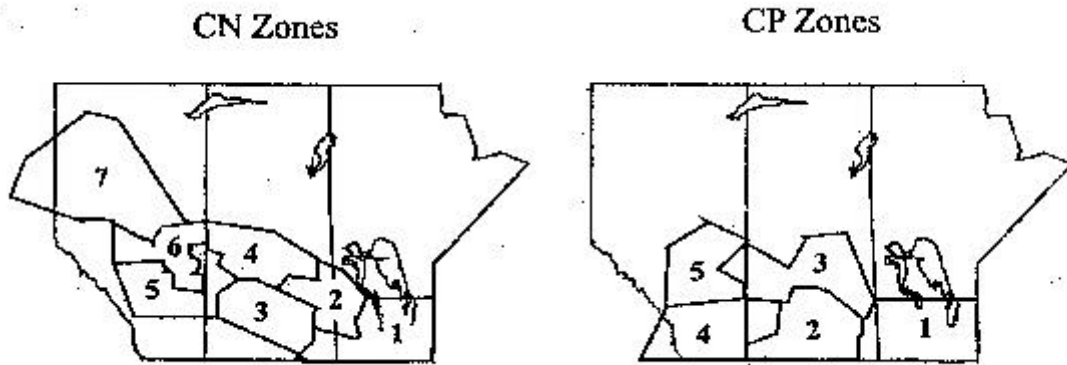
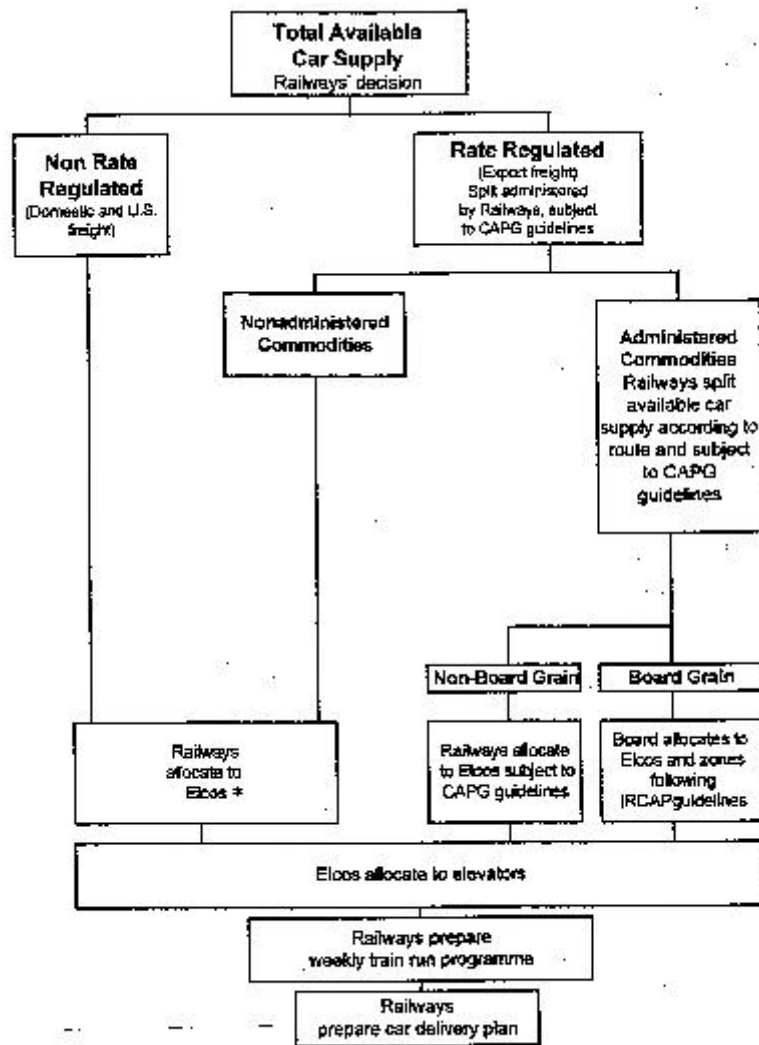


Figure 4. Canadian Railcar Allocation Zones by Railways

Source: CWB, *Car Allocation 1998-99*, 1998.

In Canada, there are currently over 200 train runs. These train runs are grouped into 12 zones, 7 on CN and 5 on CP. At the same time that industry moved to zone allocation, the railways assumed responsibility for train run programming. This function has been traditionally performed by the CWB and involves combining all CWB and non-CWB orders into a finalized loading plan. Under railway train run programming, grain companies negotiate weekly rail service directly with the railways for both CWB and non-CWB grains. With this change, grain companies and the railways have greater control of their assets and the railways take greater responsibility for directional and other efficiency movements. Figure 5 shows a graphical representation of the car allocation process.



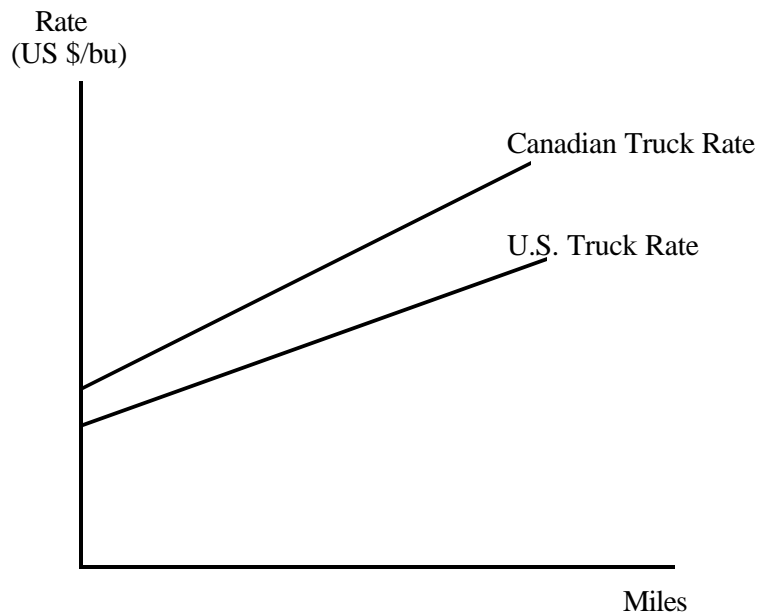
*Elcos: Elevator Companies.

Figure 5. Canadian Railcar Allocation Process

Source: Estey 1998b, 91.

3.2. Grain Trucking

Truck rates differ between Canada and the United States. Rate comparisons are shown in Figure 6. Canadian truck rates are higher than those in the United States for short and long hauls. In recent years, elevators have increasingly offered trucking premiums to attract farmers who want to offset part of the cost of transporting grain by road. Elevators, using trucking premiums, can offer different tariff rates to different farmers for the purpose of increasing their grain volume. This is accomplished by targeting trucking premiums to farmers in some specific parts of their market area (Vercammen, Fultom, and Gray 1996). Farmers ship their grain by truck to specific locations to maximize their net return. When grain companies offer competitive financial incentives to farmers to deliver grains to specific locations, companies, local elevators, and/or terminals can change the relationship between road and rail transportation as well as the distance over which trucks are competitive with railways. The growth in the Alberta feeding industry creates more demand for feed grains with truck transportation. These factors affect the competition for grain handling in Canada.



$$\text{Canadian Truck Rate} = 0.096818 + 0.0020613 (\text{Miles})$$

$$\text{U.S. Truck Rate} = 0.0785172 + 0.0007561 (\text{Miles})$$

*In 1998 the average exchange rate between the United States and Canada was US\$0.68 to C\$1.00. To convert mt into bushels for malting barley, 48 lbs/bushel is used.

Figure 6. Truck Rates Comparison Between Canada and the United States

Source: Canadian truck rate: Parsons 1998. U.S. truck rate: derived from industry sources.

Grain hauling farm trucks in Canada are larger than the older two axle, ten-ton farm truck. The newer hopper trucks travel further, pull large trailers, have more axles, and carry more grain. Many major grain companies offer trucking premiums to attract more grains to their company. The premiums have ranged from C\$2 per ton to as high as C\$5 per ton, depending on grade, quality, and location and market conditions at specific times of the year. Figure 7 shows trucking has a cost advantage within 112 miles against rail (before premium), and the distance can increase to 160 miles, 185 miles, and 235 miles with C\$2 per ton, C\$3 per ton, and C\$5 per ton trucking premiums, respectively (Parsons 1998).⁶

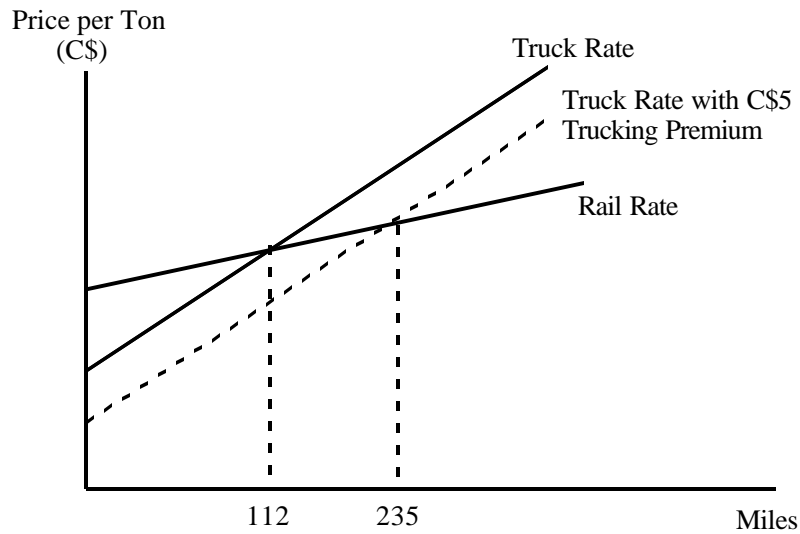
Based on Canada's current infrastructure, approximately 85 percent of grain delivery points are within 50 miles of a competing railway. It has been suggested that trucking premiums and a large scale trucking program could move grain between CN and CP and even to the main east-west BNSF line which lies just south of the U.S. border (CGC, Industry Update, August 6, 1997). Large grain companies have the ability to truck between competing railways. Thus, the grain company may act as a competitive intermediary between the farmer and the railway.

Trucking between elevators within a single company has become a routine activity in order to access the multiple car loading efficiencies railways offer at some locations. Trucking is, therefore, a part of a large number of economic activities that have direct and indirect effects on the competitive environment. Seven forms of competitive activity related to the markets for grain handling and transportation in the Prairies were identified by Parsons (1998, 22-3):

- grain company trucking premiums;
- access to more grain companies at delivery destinations;
- access to more railways by farmers and grain companies;
- lower railway incentive rates at high throughput locations with multiple car loading facilities;
- access to U.S. railways and grain companies by trucking across the border;
- grain company trucking between railways; and
- delivering by truck to alternative uses for export grain within the Prairies.

Opportunities for cross-border arbitrage will be heavily influenced by changes in transportation rates. Direct cross-border shipping has become more feasible. It is performed by trucks and rail, with loading at handling facilities located near U.S. border points. This includes joint ventures between Alberta Pool and General Mills at Sweetgrass, Montana and the venture between Saskatchewan Wheat Pool and General Mills at Northgate, North Dakota. In addition, the North American Free Trade Agreement (NAFTA) is shifting grain trade from domestic to a transborder pattern. From 1992 to 1994, Manitoba's southbound truck movements have increased from 390 to 543 trucks daily. The commercial trucking sector is focusing on heavy and long haul movements almost exclusively

⁶See Parsons (1998, 3-4) for a more detailed discussion and a trucking cost function.



$$T = 3.1 + 0.066X$$

$$R = 7.5 + 0.062X$$

where

T = transportation cost of trucking in C\$ per ton

R = transportation cost of railway in C\$ per ton

X = distance of transportation in miles

Figure 7. The Canadian Rail and Trucking Rate Functions

Source: Parsons 1998, 3-5.

by Super B and tri-axle combinations.⁷ Industry structure is shifting in favor of the larger intra and extra provincial carriers that have an adequate fleet and backhaul to incorporate grain trucking in their operations. The commercial sector, which currently dominates the heavy and long haul market, anticipates a drop in all distance categories under 124 miles (200 kilometers) in favor of trips over 124 miles. Commercial truckers foresee that an increasing proportion of agricultural hauls will originate at the farmgate (Prentice, Kosior, and McLeod 1996, 38).

⁷Tandem trailers are the largest single type of truck configuration. These vehicles are used predominately for cross-border moves and for farm to elevator shipments. Respondents of the study by Prentice, Kosior, and McLeod (1996) indicated that they will increase the size of this fleet by 14 units in the next five years. The second largest group of truck configurations is the Super B Combo. These vehicles are used for long haul (greater than 200 kilometers) and often for elevator to elevator movements. For configurations, see Appendix 1.

3.3. Grain Handling and Export Logistics

Canada's GHTS was developed over the years as an administered system closely controlled by the federal government through national transportation legislation (currently the CTA and the CWB Act). The system consists of five main services that together move grain to export position. These services are country collection, country elevation, long distance transport, terminal elevation, and port handling. Table 2 and Figure 2, in section 1, describe the relevant regulations and structural characteristics of the industry.

Government intervention has important effects on rates and quantities in the GHTS (Table 3). Before the early 1990s, the Canadian grain handling industry was largely dominated by Canadian pools, a few Canadian private firms, and Cargill which is the only major U.S. firm with Canadian handling assets. Numerous pressures have emerged for structural change. As a result, Canadian firms and pools are in a process of rationalization and confronting new competitors. Two major U.S. firms, ConAgra and ADM, have entered the industry, in addition to Louis Dreyfus, a major international grain firm. These changes will lead to greater handling capacity and efficiency, lower marginal costs, and more intense competition for origination.

In addition to these changes, there have been notable structural changes in the Canadian grain processing sector. First, due to growth in the Alberta feeding industry, that province has gone from being a large feed surplus region to potentially and periodically a feed deficit region. Barley and low quality wheat have been shipped from Saskatchewan to Alberta to meet demand for feed in the province. Feeds are also periodically shipped from the United States. In addition, ConAgra Grain has announced a proposed bio-fuel additive plant to be located in Alberta. The second important change is that several of the major grain processing firms have been acquired by U.S. firms. Canada Malt (the largest malting company in Canada, which also owns malt plants in the United States and elsewhere) was acquired by ConAgra Grain. In addition, several other Canadian malt plants have taken various forms of U.S. firm ownership. Similar changes have occurred in the Canadian flour sector where ADM Milling Company (through acquisitions of Canadian-owned plants and, subsequently, a major acquisition of plants owned by a joint venture between MapleLeaf Foods and ConAgra Grain) has established the domineering position (Wilson 1998).

One of the more important differences between the United States and Canada is the structure of the grain handling sector. In general, Canada's system is substantially more concentrated than that in the Northern tier states. Table 4 summarizes these key differences in competitive structure. Even though there have been some new entrants and expansions in capacity in recent years, the control of incumbents will in fact increase in the future relative to past capacity shares. To some degree, the Canadian concentrated corporate structure is reinforced by the regulatory and administrative practices in the Canadian GHTS.

A. Handling Costs and Cost Pooling

Marketing costs in Canada are substantially higher than those in the United States. For comparison, costs for various functions in each country are summarized in Table 6 (Parsons and Wilson 1999).⁸ In the United States the cleaning costs are not charged directly to farmers. In Canada, cleaning costs are charged on all Board grains, irrespective of whether it is cleaned or the level of dockage.

In Canada, costs of marketing Board grains are aggregated and deducted from total sale revenue. Practically, the pooling of costs is inseparable from the pooling of sale prices. Unlike in the United States, where values of grain adjust instantaneously to changes in sale prices and shipping costs, the pooling mechanism masks the values (costs and prospective returns) for individual transactions. Consequently, any costs associated with ‘inefficient’ grain movements are absorbed by Canadian producers who sell through the CWB.

Historically, the Canadian GHTS has been shaped on the basis of the following criteria (CWB, August 1995):

- all farmers should have equal access to the market and the transportation system;
- all farmers should receive the same price for the same type and grade of grain; and
- all farmers should pay equal per mile rail costs regardless of where they are located or the type of grain they ship.

This is clearly viewed as a problem in Canada—concerns about systemic inefficiencies underlie the controversy about whether the CWB should retain its single seller status. With losses on individual transactions obscured through cost-averaging, it is harder to gauge the ‘fairness’ of Canadian sale prices. (For that matter, it is hard for Canadian producers to know the value of their grain in terms of current sale opportunities.) If marketing costs for Board grains are inflated, the effect may be to accentuate the gap between U.S. and Canadian producer prices, creating greater incentive for cross-border arbitrage (Johnson 1998).

B. Cleaning Regulations and Practices

Commercial movements and cleaning of Prairie grains may be subject to three sets of CGC quality standards—commercially clean, export grade determinants, and primary grade determinants. When producers deliver grain into a primary elevator and when shippers deliver grain to terminals, the primary grade determinants are applied to determine payment. When grain is exported (except to the United States, where apparently primary grade standards or buyer specifications may apply), commercially clean and export grades apply (Parsons and Wilson 1999).

⁸In 1998 the average exchange rate between the United States and Canada was US\$0.68 to C\$1.00. To convert mt into bushels for barley, 48 lbs/bushel is used.

Cleaning grain to the tight export standard requires very sophisticated and expensive cleaning equipment, as well as care in handling and loading clean grain. The export standards, and the level of cleaning required to achieve them, are unique to Canada. Two major commercial competitors of Canada, the United States and Australia, do not clean grain as intensively. The cleaning standard for export in Canada is intended to provide an advantage for Canadian grain in world markets.⁹ Grain cleaning at port terminal elevators can be characterized as having economies of size and scope due to their extensive investment in grain cleaning and their ability to clean all grains and oilseeds delivered. Blending and producing more consistent composition of screenings are port advantages. As well, these investments can be considered sunk costs. Since country cleaning operations are not designed to clean every ton to be exported, grain cleaning capacity will continue to be required at port terminal locations.¹⁰

Grain is cleaned for a variety of reasons, but principally to remove dockage to meet the export standards established by the CGC. Low dockage is a major selling point of the CWB export program. However, some non-CWB grains and some CWB shipments to the United States are not cleaned at the export standard. One reason for cleaning at ports instead of inland is the economies of scale needed to efficiently operate grain cleaning and reclaiming equipment. The second reason is that the freight cost of the dockage was not significant when rail freight subsidies were in place (Kraft 1997). However, there has been an increase in grain cleaning on the Prairies relative to cleaning grain at export terminals where, traditionally, most grain was cleaned for export. Freight rates on moving grain to ports are no longer subsidized and the shipper cost of moving all grain to ports has increased significantly since the beginning of the 1995 crop year.¹¹ Freight savings on dockage movement are an incentive to clean on

⁹Cleaning Prairie grain is an expensive proposition. For example, in the new inland facilities that are being constructed, the capital cost for all of the associated cleaning operation equipment can range between \$1.5 and \$2.0 million. In contrast, a U.S. country elevator of comparable size, which does not need to clean to the same export standard and does not recapture grains initially cleaned out as dockage, invests under \$0.5 million in its cleaning equipment [Grain Cleaning Study Consortium (GCSC) 1998)].

¹⁰Much of this material is summarized from a recently completed study on Canadian grain cleaning (GCSC 1998).

¹¹Weighted average deductions from farmers for barley freight increased more than 100 percent for all CWB grains between 1994-95 and 1995-96 crop years. For wheat, durum, and barley, weighted average deductions from farmers for freight increased from C\$12.74, C\$13.32, and C\$12.60 to C\$31.38, C\$29.10, and C\$31.86, respectively (CWB, *Statistical Tables*, 1998).

the Prairies. In addition, grain companies have begun to construct new high throughput Prairie elevators (HTPE) which provide the scale of economies to clean grain down to export standards.¹²

Cleaning grain on the Prairies provides a greater margin than cleaning at port terminal locations. Table 10 shows wheat cleaning costs and returns for Canadian and U.S. elevators. There are two fundamental reasons for greater margins on the Prairies—the freight savings to inland locations by removing dockage and the lower cost of labor at inland locations relative to the port terminal elevators located in Vancouver and Thunder Bay. These cost savings outweigh the economies of scale advantage that exists with port terminal elevators’ cleaning operations (GCSC 1998).

Table 10. Wheat or Barley Cleaning Costs and Returns for Canadian and U.S. Elevators

Costs	Country Elevator		Export Elevator	
	Canada	U.S.	Canada	U.S.
-----US¢/bu-----				
Fixed Costs	0.5	0.42	0.5	1.0
Variable Costs				
Variable costs of operation	1.0	1.3	2.1	1.6
Wheat loss	3.6	1.4	4.3	2.3
Total variable costs	4.6	2.7	6.4	3.9
Variable Revenue				
Reclaimed wheat and feed	2.9	0.0	4.6	0.0
Screenings	2.4	2.6	3.4	2.3
Producer paid cleaning fee	6.7	0.0	6.7	0.0
Wheat transportation savings	1.5	2.4	0.0	0.0
Total additional revenue	13.5	5.0	14.7	2.3
Net Cleaning Margin	8.3	-1.9	7.8	-2.5

Source: GSSC 1998 and Scherping et al. 1992 for the United States.

¹²The GCSC study estimated that 66 HTPEs clean grain on the Prairies. Those 66 elevators clean around 4.2 million tons, or 13 percent of grain delivered into the transportation system. Another 54 locations are planned to have grain cleaning equipment, which could result in an estimated 9.0 million tons of grain cleaned inland, or 27 percent of current deliveries (GCSC 1998, 54-55).

C. Export Logistics

Canadian grains are shipped from farms to country elevators by farmer-owned trucks, with an average cost of \$5 per ton. Grains are stored in country elevators, cleaned, weighed, graded, and eventually put into hopper cars on branch lines which are then hauled to main lines, where cars are assembled as a unit train which is sent to an export port. The CWB, as single-desk seller of western Canadian wheat and barley, ships over 60 percent of grain but does not own elevator facilities. It relies on the grain companies and pools to fill orders and shares the same facilities with non-administered and non-Board grains, such as rye, flax, oats, canola, feed wheat, and feed barley. Most storage is located on farms and is not part of the commercial supply channel. Commercial storage at primary elevators and export terminals is limited compared to other competitors in international grain markets (Parsons and Wilson 1999).

The Canadian logistics system strives to operate on a 'just-in-time' basis. This system requires close cooperation among buyers, suppliers, and transportation providers; reliable rail service; efficient stock management at port terminals; and timely vessel arrivals. The smooth interaction of these factors is critical (Denham 1997). The sale starts with chartering a vessel, usually specifying a 30-day arrival window. For most CWB sales, the buyer (or its agent) arranges the ocean transportation (i.e., the sale is FOB port). For non-Board shipments, the seller (grain company) usually charters the vessel and deals directly with the customer to tailor transportation to final destination. For both Board and non-Board sales, the logistics process is geared toward meeting the vessel's scheduled arrival date (WESTAC 1998).

Problems at ports include congestion of the system. It is important to bring the right grain into and through the system when it is needed. Clogging the system with "unneeded" grains can quickly reduce the efficiency of port operation (Transport Canada 1999 and Wilson, Dahl, and Carlson 1998). In the grain industry, the Canadian philosophy has been to get the grain to the ocean terminals when the ship comes in. In many cases it is not the right grain, so a ship may have to be re-berthed an average of 3 times before it gets the 40,000 tons of grain. The current system for moving grain in western Canada is not designed to be efficient or customer focused. After hopper cars are hauled to Vancouver, they are often switched several times to get to the right company's terminal. After switching, it may be found that they still do not have the right blend of grain in the terminal for the ships that are arriving. The average ship re-berths 3 times at a cost of \$10,000 per berth, or \$0.75 per ton (Denham 1997). In 1996, the average vessel waiting time at port in Vancouver was 12 days, while it was 4 days in the U.S. Gulf (Table 5).

4. Rationalization and Current Policy Issues in Canada

Substantial volumes of grains are produced each year across the Canadian Prairies and transported to numerous domestic and foreign destinations. In this environment, the GHTS is important to maximize system efficiency, competitiveness, satisfaction, and capacity utilization for grain producers, shippers, and carriers. To improve efficiency, rationalization of the system is underway in the Canadian GHTS. The rationalization of primary elevators and abandonment of railroad branch lines are closely

related. Many high throughput elevators have been built and the number of inefficient elevators has decreased. Rail branch lines and short lines have been abandoned as a consequence of the decreasing number of elevators. Abandonment of rail branch lines and short lines leads to increased trucking.

Recently, Canada has moved towards deregulating its grain transportation system. On December 21, 1998, after a one-year intensive review, the final Estey Report to the Canadian Minister of Transport was released to the public. The final report asks one central question: What alterations, additions, reductions, or other organic changes are required (if any) in the present administrative and commercial regulations of the grain industry, in order to strengthen and enhance the position of Canada in the global grain market? In the final report, every single issue is comprehensively discussed and 15 important policy implementations are recommended.

Ending grain transportation subsidies and deregulating railways have been forcing the Canadian GHTS to improve efficiency and to raise policy issues such as rail deregulation, trucking, and port buying. Recommendations from the Estey Report range from policies to potential efficiency gains. Not all are discussed here. However, there are three of particular importance to the North American grain trade. These include the prospective effects of rail rate deregulation, trucking, and port buying.

4.1. Reform Package (http://www.tc.gc.ca/releases/nat/00_h034e.htm)

The GHTS in Canada is currently under reform. On May 10, 2000, Canadian Transport announced the government's intention to introduce measures to increase efficiency and cut costs in Canada's GHTS. The reforms were implemented on August 1, 2000, and include:

- the establishment of a revenue cap that provides for an annual estimated \$178 million reduction in railway revenues, which represents an estimated 18 percent reduction in grain freight rates from 2000/2001 levels;
- the phasing in of CWB tendering for logistical services for grain shipments through the ports of Vancouver, Prince Rupert, Thunder Bay, and Churchill, from at least 25 percent of their volume in 2000/2001 to a minimum of 50 percent in 2002/2003; and
- amendments to the CTA to facilitate the transfer of branch lines to community-based short lines and to simplify the Final Offer Arbitration process (<http://www.tc.gc.ca/>).

The government of Canada is trying to create a more efficient, accountable, and competitive GHTS that will cut costs for western Canadian grain producers.¹³ The decision is based on both the Estey and Kroeger Reports confirming that changes are required in the GHTS. These changes are designed after balancing the interests of various stakeholders and ensure that producers can deliver their products at a reasonable cost and efficiently to port (<http://www.tc.gc.ca/>).

¹³Western Canadian grain producers need an efficient and reliable GHTS because each year they export an average of 30 million tons of grain, valued at C\$6 billion.

The reform package contains six main components:

1. Replacement of the current maximum railway rate scale with a cap on annual railway revenues from grain;
2. Funding for Prairie grain roads;
3. Creation of a more commercial and competitive system for moving grain from country elevators to ports, which will be achieved through the expansion of tendering for CWB shipments to port;
4. Improvements to the Final Offer Arbitration (FOA) provisions of the CTA;
5. Improvements to the branch line rationalization process; and
6. Continuous monitoring and reporting by an independent private-sector third party to assess the impact of these changes.

A. Revenue Cap and Rate Cap

Effective August 1, 2000, an annual cap on the revenues that can be earned by CN and CP railways from grain traffic have replaced the old rate cap. The revenue cap will allow the railways more flexibility in negotiating freight rates and service packages. The revenue cap for crop year 2000/2001 is set at \$27.00 per ton for the two railways combined. This cap represents a reduction of \$5.92 per ton, or 18 percent from the estimated effective rate of \$32.92 per ton for 2000/2001, which results in an estimated \$178 million reduction in railway revenues for a typical 30-million ton annual movement.

Under the revenue cap, railways will have flexibility to vary individual rates to reflect efficiency and offer more innovative service. Compliance will be monitored by the Canadian Transportation Agency, based on actual grain movements and distance hauled. Any railway earnings in excess of the cap will be repaid with a penalty. The revenue cap will be adjusted annually to reflect inflation starting in 2001/2002. Additionally, tariff rates for single car movements originating on branch lines will not be allowed to exceed main line tariff rates for similar movements by more than 3 percent.

B. Grain Roads

The Government of Canada recognizes that grain handling and transportation reforms will increase pressures on rural roads and, in consequence, is prepared to make a contribution of \$175 million over five years to help address this problem.

C. Grain Handling and Transportation Logistics

The CWB role in the GHTS will be modified. The CWB will operate through contractual arrangements with the railways, grain companies, and farmers. The CWB will also have the ability to negotiate overall car supply requirements with the railways to move the entire volume of its business to port. However, for the portion of its business that is tendered, the CWB will contract with the grain companies, who will in turn contract with other parties for transportation and other services.

The CWB will tender the logistics of at least 25 percent of its wheat and barley shipments to the ports of Vancouver, Prince Rupert, Thunder Bay, and Churchill in crop years 2000/2001 and 2001/2002, and at least 50 percent of its shipments to the four ports in crop year 2002/2003.

For non-tendered grain shipments, the industry and the CWB will determine how railcar supply will be allocated among shippers. Should circumstances arise where the CWB feels compelled to use its regulatory car allocation powers to fulfill its mandate, it will provide prior public notice and make public an impact analysis of its use of the power.

The details for implementing these new elements will be confirmed in a Memorandum of Understanding between the Minister responsible for the CWB and the CWB prior to enforcement of the legislative amendments.

D. Safeguards

The government will modify existing Final Offer Arbitration (FOA) provisions contained in the CTA as follows:

The FOA provisions will be modified to address a long-standing complaint from the shipper community that the process is too long and expensive. FOA will have a simultaneous offer structure with a summary process for disputes under \$750,000.

Amendments to the Act will permit a shipper to exclude references to the proposed rates when initially submitting a matter for FOA. After ten days, the shipper and the railway will exchange their final offers, including rates.

Parties involved in arbitration for freight charges which will total less than \$750,000 can elect to use a simplified FOA mechanism. In this faster process, the time between the shipper filing the

initial submission and the final decision will not exceed 30 days. At the request of the shipper — or for arbitration of disputes above \$750,000 — the existing 60-day process will be followed.

The establishment of a three-person panel — only if both parties agree — will provide an opportunity for a larger panel to hear more complex disputes.

The issue of more open access to rail lines is being referred to the upcoming review of the CTA. Effective ways to enhance competition in the railway sector, including enhanced running rights, regional railways, and other access concepts, will be given priority consideration. An interim report on this issue will be given within the first six months of work.

E. Branch Lines

Provisions for branch lines will be enhanced to further facilitate transfer of grain dependent branch lines to community-based short lines. Measures will be put in place for railways to provide transitional compensation of \$10,000 per mile annually for three years, to affected municipalities/counties/communities when a grain line is closed.

When a railway transfers a grain line segment, the railway will be required to operate the remaining part of the branch line for three years. To discourage "de-marketing" of grain lines (i.e., purposefully deferring maintenance or lowering service levels to make the line uneconomical) the agency will be able to:

- order the company to improve services on the grain line;
- grant running rights to another party; and
- require the railway to identify the grain line for discontinuance in their three-year plan.

F. Monitoring

As part of its policy decision on grain handling and transportation, the government of Canada will establish a mechanism of continuous monitoring, measurement, and reporting to provide information to the Minister of Transport, the Minister of Agriculture and Agri-Food, the Minister responsible for the CWB, and other interested parties on the impact of these reforms and the overall performance of the reformed GHTS. Should any problems or opportunities for improvement be identified, the government will be in a position to act.

This mechanism will be put in place by an independent, private sector third party who will assess the following factors:

- the benefits to farmers;
- whether the CWB marketing mandate is adversely affected;
- the effect on grain handling efficiency;
- the effect on railway efficiency;
- the effect on port efficiency for grain; and
- the overall performance of the GHTS.

4.2. Primary Elevators and Efficiency

The number of primary elevators in the Prairies reached its maximum in the early 1960s at over 5,200; there has been a continued reduction in numbers for over 30 years. Further rationalization will occur, with many smaller facilities replaced by high throughput elevators. The 1,153 primary elevators in the Prairies in 1998 will continue to fall. Although many small elevators have been abandoned, there has been some construction of new large throughput elevators and reconstructing and expansion of some older houses in the system (Parsons and Wilson 1999).

Efficiency in Canada's transportation and handling system depends on the logistical integration and the coordination of physical movements at all stages. The system strives to spread grain deliveries and movements throughout the year to allow for regular, highly efficient, low cost train movements. In practice, the system does not always work this way. Often there are many operating inefficiencies. Accountability for these problems is unclear with shared responsibilities imposed through legislation and interpreted through industry government negotiations and committees. Canadian grain handling has been seen by nearly all system participants (farmers, grain companies, railways, CWB, and federal and provincial government) as having a large number of system operating inefficiencies. Some of these inefficiencies are summarized in Table 11 (Parsons and Wilson 1999, 8).

Table 11. Some Known Inefficiencies in Western Canadian Grain Handling and Transportation

Transport Service	Inefficiency	Transport Service	Inefficiency
Country collection	Rail Branch Line Network Branch Line Assembly Railway Tax Burden CWB Grain Assembly CGC Grade Requirements Railcar Allocation Statutory Railway Rates	Long Distance Rail	Multiple Origins and Destinations Multiple Car Loading Spots Car Allocation & Train Assembly Insufficient Use of Unit Trains Car Capacity Loading Work Rules Statutory Freight Rate Structure
Country handling	Size of Elevator Low Turnover Rates Cleaning and Drying Capacity Export Grade Match-ups Railcar Loading Capacity	Terminal Handling	Competitive Structure Terminal Grain Cleaning Excessive Storage Low Turnover Rates Export Grade Match-ups
System issues	Accountability Taxation Information & Planning	Port Services	Competitive Structure Work Rules Demurrage Charges Congestion and Routing

Source: Parsons and Wilson 1999.

4.3. Railroad and Trucking

A. Abandonment of Rail Branch and Short Lines

As the grain collection system moves toward a network of high throughput elevators, the number of small country elevators decreases and branch lines and short lines that once served them are abandoned. Closing small country elevators and abandoning branch lines and short lines cause heavy traffic of grain trucks on highways and country road systems. Canadian railway legislation has provisions for the abandonment of rail branch lines, as described by the Estey Report 1998a, 10:

“The railways have, in various ways, described the future rail system as consisting of high quality mainline and secondary mainline service. The producers and other interested parties take the view that in order to dispose of a branch line, the railway should be required to offer it to potential buyers as a complete branch line unit rather than breaking it up and offering the assets on a piecemeal basis. The issue is whether the expressed desires and plans for the railway lines that are said to be uneconomic are consistent with present legislation and the greater national interest in establishing and maintaining a comprehensive and healthy rail network. It is further questioned whether the interests of the producer and the community which are served by these lines are adequately protected in the event of closure under present legislation.”

“Some producer associations state that the entire question of closure of rail lines which serve a captive community should be fully examined by an appropriate authority as a forerunner of establishing standards and procedures. Some stakeholders state that a modern moratorium should be established by Parliament pending a comprehensive study of railway lines exposed to the disposal program of railways. Some farmers and other interested parties advocate a contribution from the railways recognizing that the community, through its government, has relieved the railroads of their admitted financial burden in taking over the branch line.”

When a line does not make enough profit, it is identified as a candidate for closure or transfer. To minimize rail line abandonment or closure, which generates a negative impact on the communities served, the CTA requires an obligation advertising the line for sale and negotiating with potential buyers. The CTA anticipates that such negotiations are successful and the lines are transferred to short line operators. It is recommended that the community be given the opportunity to acquire the branch lines as a complete unit and permit the buyer to operate the line as a short line railway (Estey 1998b).

B. Rail Deregulation

The WGTA was ended in 1995. The federal government of Canada had investigated a review of grain transportation and handling in 1998, which may result in further changes to the Canadian GHTS. In 1995, the Canadian government ended the WGTA subsidy because of budget considerations and the need to comply with the GATT/WTO agreement. The WGTA and NTA were merged to create the CTA. The CTA marks the end of special regulatory treatment of grain and moves

toward the deregulated environment faced by other bulk commodities. Since the CTA still contains a number of regulations pertaining to grain movement, it is an attempt to adopt market mechanisms for determining freight rates, while allowing some government interventions over interswitching competitive line rates (CLRs) and FOA.

The CTA establishes a maximum rate scale annually from which the railways develop tariff rates for the movement of western grain. The railways advocate the removal of the rate cap, leaving the establishment of appropriate rates to the market place as is the case now in all other classes of freight. However, there is not universal support for this view among the other stakeholders. Farmers and grain companies are concerned that without genuine competition between railways, freight rates will become exorbitant, thereby threatening the existence of the grain industry in the Prairies. Those who favor the rate cap believe that it should remain in effect at least until an appropriate substitute has been established by legislation. Under the CTA, increases in grain freight rates are still limited, but the future of this cap is uncertain. If removal of the freight rate cap occurs, it is expected that the railways' market power will increase the freight rates for grain.

In Canada, farmers have little bargaining power with the railroads, as described by Estey 1998a, 13:

“Another important issue concerning rail rates is the total absence of the farmer from the rate-setting process. The farmer has no input in the freight rate negotiations between the railways and the CWB, or between the railways and grain companies, for the movement of his/her grain. Yet, those costs are borne by the farmer through deductions from his/her grain ticket. Under the current system the farmer has no status to challenge those rates. The issue, therefore, is what process should be established in order to protect the interests of the farmer in ensuring that freight rate reductions and savings are passed on to him/her.”

However, to counter this and provide an inducement, the CP proposed a repeal of the rate cap in exchange for a guaranteed freight revenue reduction. “The effect of this proposal was modified somewhat to assure the reduction of freight costs, en bloc, by C\$6.66 million per annum for six years. The guarantee is for annual savings to the shipper amounting to C\$40 million in six years or by 2005 if the rate cap is removed in 1999 ” (Estey 1998b, 32). Discussions with respect to the proposal took place a few days before the final report was submitted.

C. Trucking

Some stakeholders are concerned that branch line closures and elevator consolidations are affecting farmers and governments. This raises the question as to whether the use of larger trucks to haul grain greater distances from the farmer to the elevator (a) has raised the cost of trucking to the farmer, and (b) has had a significant impact on the burden of road repair, particularly in the case of the grid roads in western Canada. The issue also arises in paved highways installed and maintained by the provinces which are not up to structural highway specifications (Estey 1998b).

Major railway rationalization will occur and the number of elevators is likely to drop over the next few years. Grain will be transferred from rail to an already overburdened road system because thousands of kilometers of Canadian branch lines will be lost. For certain regions, it is less expensive for producers to truck grain more than a hundred kilometers than by rail (Harrison 2000). Much of this is due to the long winding routes to get back to the main line. Producers moving grain ever further by truck do not face the direct cost of road maintenance and upgrading. For this reason trucks look inexpensive compared to rail. Economic incentives for using trucks are good news for producers, but they also have negative impacts on the road.

4.4. Port Buying

The recent McKinsey report claims that the Canadian logistics system for Board grains is currently under-performing relative to requirements of customers and the needs of farmers. The report suggested that the Board could withdraw and allow grain handlers to manage the logistics system from farm to port as agents. The coordinating role of the CWB is seen as inefficient (McKinsey 1998 and Carter, Loyns, and Berwald 1998) and the role has been drawn into question in the recent Estey Report with suggestions that the CWB become a port buyer.

At the present time, the CWB has virtual control over Board grains and has some influence on the non-Board grain system because of car allocation and other functions. A proposal has been advanced by some stakeholders which would remove the CWB from any and all activities from farmgate to the port of export. This would leave grain companies and railways responsible for all operational issues; some grain companies support this proposed solution. The Western provinces identified the role of the CWB in transportation planning as an important issue and suggested that the future role of the CWB be driven by a goal of maximizing producer benefits (Estey 1998b).

However, the CWB has indicated the Board could not effectively function as a single-desk marketer and provide its core service to farmers if the Board were buying at port. They have suggested that confining the CWB to port would cost farmers more by increasing costs, increasing risk, and reducing their ability to react to customer requirements (CWB, *Efficiencies Resulting from the CWB's Role in Transportation*, 1998, 2). As expected, there are numerous details yet to be worked out if/when a port buying system is adopted. An important implication for U.S. grain is that all of the focus of these deliberations has been on mechanisms to guide port buying for off-shore sales. Yet to be defined is how such a mechanism would operate for trade within North America, including both sales within Canada and those made to the United States.

5. Implications for Grain Trade

There has been considerable pressure for changes in Canada's GHTS. Some industry trends, such as the rationalization of elevators in the Prairies and investments in new high throughput facilities, are being driven by market and competitive forces and, to some extent, by anticipated changes in the regulatory environment. These changes may have a significant impact on cross-border grain flows. There are also a number of proposed policy changes, including elimination of the caps on rail rates, deregulation of car allocation, and port buying by the CWB, which may or may not take effect. In this section, we highlight some of the important issues and indicate how they may affect grain trade and cross-border competition.

5.1. Changes in Grain Handling

Perhaps the biggest story in western Canadian grain handling is the rapid adoption of high throughput interior elevators in the Prairies. The new facilities are positioned to take advantage of anticipated deregulated rail rates.¹⁴ The rapid adoption of high throughput interior elevators reflects an acceleration of ongoing pressures for industry rationalization. Rationalization will result in fewer but larger elevators—similar to what has occurred in the United States. Near term, there is likely to be excess handling capacity in the Prairies, particularly relative to export capacity on the West Coast. Excess capacity will tend to reduce handling costs and charges, while the limited export capacity and high throughput facilities (e.g., in cleaning and segregation) will cause more direct shipments from interior locations to U.S. destinations.

The new high throughput elevators will be able to assemble large volumes of grain for shipment by unit train. Combined with procurement advantages of the Board system, this system will provide direct grain movements from a single point of origin to various end users. Note that this is in contrast to the past practices of shipping grain from multiple origins via single cars to Thunder Bay for cleaning, segregation, and reshipment to the United States. Reduced handling costs could make it somewhat more attractive for grain to enter the Board marketing system instead of shipping to export ports. That would be consistent with simulation results reported in Johnson (1999). In an earlier study, Johnson and Wilson (1994) also showed that reductions in Canadian handling costs would induce larger flows of Canadian barley into the Canadian commercial handling system and shipments to U.S. markets.

5.2. Reciprocal Access to Marketing Functions

Several Canadian grain marketing functions are discriminatory with respect to country of origin. These include: 1) access to the lower regulated rail rates; 2) access to railcars, in terms of both ownership and control (through allocation procedures); 3) CGC regulations governing inbound grain (i.e., testing and segregation); and 4) access to the CWB marketing mechanism. In contrast, functions

¹⁴For example, they may expect to realize large cost savings for unit train shipments after rail rates are deregulated. At present, the rate differentials for multiple car shipments are much smaller in Canada than in the United States.

performed in the U.S. marketing system are non-discriminatory with respect to the origin of grain. In the United States, railroads are common carriers and licensed elevators are public warehouses; as such, they must offer the same services to all customers.¹⁵

Reciprocal access is the issue developed recently under the December 1998 *Record of Understanding with Canada*. In the near term it will be dominated by issues related to end use certification and the cross-border trials. However, longer term, it will likely center on rail transportation. If the rate cap is retained and U.S. growers are denied access, Canadian grain will continue to enjoy a shipping advantage to ports. Not having the ability to ship through Canada also prevents U.S. growers from developing countervailing market power against northern tier railroads.

The CWB and Canadian trade authorities are sure to argue for retention of the policies and unique regulations favoring their farmers and industries. Issues connected with grain quality may provide a pretext for discriminatory treatment, but the rail issue is probably much more significant. If Canadian authorities were to allow U.S. grains to be shipped through their system at non-discriminatory rates, they would have to: 1) eliminate the rate cap legislation; and 2) dispose of railcars and end the favorable treatment given Canadian shippers.

A. U.S. Grains Through Canadian Railroads

In August 1998, U.S. officials and representatives of CP requested that the Canadian Food Inspection Agency (CFIA) review their requirements regarding in-transit rail movement of grain through western Canada. After consultation with concerned parties, the CFIA simplified handling requirements for U.S. grain by accepting a certificate of origin¹⁶ (Appendix 3) instead of a Phytosanitary Certificate (with declarations for freedom from dwarf bunt, flag smut, and Karnal bunt¹⁷) for grain that meets all of the following conditions (<http://www.cfia-acia.agr.ca/>):

¹⁵These issues and legislative/regulation authority are described in Wilson and Dahl (1998).

¹⁶Appendix 2 is the application form for the State of Origin Certificate for In-Transit Grain Shipments.

¹⁷“Karnal bunt is a fungal disease of wheat first found in the United States in March 1996, when it was discovered in Arizona. Since then, the U.S. Department of Agriculture has also regulated limited areas of California, New Mexico, and Texas. Although Karnal bunt does not pose a significant crop loss threat to U.S. wheat producers, it is a disease of significance when grain moves in international markets” (<http://www.aphis.usda.gov>).

- the grain originates in U.S. approved areas (Minnesota, Montana, and North Dakota);
- the grain will transit through Canada only by rail (in sealed hopper car);
- the grain will return to the United States; and
- the grain will not be unloaded in Canada.

On December 3, 1998, the United States and Canada entered into an agreement to resolve longstanding agricultural trade issues including grain trade and animal trade. In-transit movement of U.S. grain through Canadian rail, the U.S. wheat access to Canadian facilitation, Karnal bunt, and exchange of grain trade information are major items that benefit U.S. producers in grain trade. Effective January 1, 1999, Canada has implemented the program that gives U.S. shippers and producers of U.S. wheat, barley, oats, and rye a new option. Under the program, U.S. producers and shippers have better transportation access to final West Coast destinations in the United States, which could result in more competitive rail rates for grain shipments from the Northern Plains to the West Coast ports.

Under the *Record of Understanding with Canada*, U.S. wheat and barley may be shipped in-transit through Canada with a certificate of origin. Table 12 shows the amount of wheat and barley flow through the in-transit program. The in-transit rail program reduces the need for phytosanitary testing of the grain and permits a more timely and cost efficient shipping schedule. This program allows U.S. shippers to ship the selected agricultural commodities to final West Coast destinations in the United States through the Canadian rail system. According to state officials, in-transit certificates had been issued for the movement of more than 1,580 million and 1,420 million pounds of grain in 1999 and 2000, respectively. However, U.S. exporters and Canadian railroads would like to expand this program to the port of Vancouver (USDA/FAS, <http://www.fas.usda.gov/itp/us-canada.html>).

Table 12. U.S. Grain Through Canada In-transit Program

	1999	2000
----- lbs -----		
North Dakota		As of October
Barley	447,204,583	300,694,611
Wheat	777,557,442	664,710,847
Minnesota		As of August
Barley	212,689,487	58,934,922
Wheat	27,730,749	172,983,880
Montana		As of November
Barley	2,912,102	1,060,000
Wheat	113,503,600	221,792,813
Total	1,581,597,963	1,420,177,073

* For comparison purposes, in calendar 1998 in-transit from North Dakota was: wheat 82,749,000 lbs, barley 315,000,000 lbs, for a total of 397,745,000 lbs (180,415 tons).

Source: Departments of Agriculture in North Dakota, Minnesota, and Montana.

Those who ship grain through the Canadian rail system are required to fill out an application form (Appendix 2) for “State of Origin Certificate - In-Transit” (Appendix 3) issued by their respective states’ agricultural department. Canadian Pacific Railway will apply “Request for Release Approval” (Appendix 4) with the origin certificate and CP’s cargo control document (Appendix 5) to the Western Import Service Center of CFIA. After the service center reviews the documents sent by CP, the approval is released to CP. At the port of entry in Canada, Canadian Customs inspects the documents and releases the railcars for in-transit movement.

According to phone interviews with elevator managers in North Dakota, there are no large differences in rail rates from North Dakota to West Coast destinations between BNSF and CP. The elevator managers on the BNSF and CP lines use the in-transit program because of availability of railcars. The freight rate is consistent across the state for west bound shipments on both railroads but differs for east bound shipments. Elevators in the western and northern parts of the state ship more of their grain to West Coast destinations than elevators in the east or southern parts of the state. Most elevators do not have access to both railroads so their choice of railroad is largely determined by their locations rather than freight rates. Table 13 shows selected rail rates from North Dakota to West Coast destinations.

Table 13. BNSF and CP Rail Rates for Grain Shipments from North Dakota Origins to the U.S. West Coast Under the In-transit Program

Origin	Destination	Rail Rate \$/bu		
		Grain Type	BNSF	CP
Alsen, ND	West Coast	SWT		1.55/single
Fairdale, ND	West Coast	SWT		1.45/single
Fairdale, ND	California	Barley	0.92/single	0.92/single
Fairdale, ND	West Coast	Barley	0.79/single	0.79/single
Harvey, ND	West Coast	SWT		1.39/Unit
Linton, ND	West Coast	SWT	1.41/unit	
Minot, ND	West Coast	SWT	1.60/single	
Newburg, ND	West Coast	SWT		1.55/single
New Rockford, ND	West Coast	Barley	0.78/single	
New Rockford, ND	West Coast	SWT	1.41/unit	
Parshall, ND	West Coast	Barley		0.79/single

B. Cross Border Grain Movement: The Canadian Wheat Access Facilitation Program

Access to Canadian primary elevators is vital for U.S. producers to enhance opportunities for grain sales to Canada. The Canadian Wheat Access Facilitation Program (WAFP 1998) is to improve access for U.S. grain producers and other sellers to the grain handling and consumption system in Canada. WAFP establishes rules for producers and sellers of wheat produced in eligible states in the United States (currently Montana and North Dakota) who want to move wheat by truck directly to western Canadian country elevators for resale or transshipment. Under the program, a seller must obtain a phytosanitary certificate¹⁸ for his/her wheat, arrange for its sale to a participating Canadian country elevator, and ship wheat to the Canadian border. Following completion of the normal Customs requirements, wheat is delivered to the elevator in Canada (<http://www.fas.usda.gov/info/factsheets/>).

Wheat producers from approved areas in Montana and North Dakota or grain handlers of wheat produced in those areas could benefit from WAFP. The producers and handlers can sell and deliver wheat directly to participating Canadian country elevators (Appendix 6) by truck for storage and forwarding to the Canadian domestic market or export location. A producer selling his/her wheat directly to a Canadian elevator needs to obtain a phytosanitary certificate which includes the following: “The grain originated in an area free from *TILLITIA INDICA* (karnal bunt) on the basis of official surveys, The grain is free from spores of *TILLICIA INDICA* (karnal bunt) on the basis of official laboratory testing,” and “The grain originated in an area free from *TILLETIA CONTROVERSA* (dwarf bunt) and *UROCYSTIS AGROPYRI* (flag smut).”

The Canadian Grain Commission (CGC) has issued licenses to primary elevator facilities to handle U.S. wheat, subject to WAFP participation and adherence to the requirements. Currently, 5 grain companies have proposed a total of 27 facilities, most of which are located within 60 miles of the U.S.-Canada border, for the program. Prospective U.S. wheat producers or other sellers negotiate sales contracts with Canadian buyers covering price, quantity, quality, delivery, currency of payment, and other terms. Before admitting the wheat into Canada, Canadian Customs officers will verify the following documents:

- Canada Customs Form B3 (Appendix 7) for the identification of goods being imported;
- a Canada Customs or commercial invoice form (Appendix 8);
- a Cargo Control Document or manifest¹⁹ in a format acceptable to Canadian Customs;

¹⁸Montana and North Dakota growers must ensure that the wheat originates from an area that has been officially surveyed for karnal bunt and where flag smut and dwarf bunt are not known to occur. Information on these areas and other information may be obtained from the state departments of agriculture in North Dakota and Montana.

¹⁹The cargo control document for WAFP will be prepared by the trucking company transporting U.S. grain to Canada; it will be similar to Appendix 5 in style and contents.

- the CGC Importer Declaration²⁰ (Appendix 9); and
- a copy of a USDA phytosanitary certificate²¹ (Appendix 11).

In addition to these required documents, there are more complicated and cumbersome requirements that can be trade barriers in the Canadian regulation of the program, “Memorandum to the Canadian Trade Licensed Primary Elevators Handling U.S. Wheat.” The CGC requires the importing companies in Canada to arrange for a CGC representative to be at the elevator at the time of delivery to monitor the unloading of the grain, to take a sample for information purposes, and to ensure that the elevator follows the procedures and that U.S. and Canadian wheat are not commingled. The following are CGC requirements to import U.S. wheat:

- “Primary elevator facilities are required to notify the CGC’s Prairie Region Office of the upcoming arrival of U.S. wheat at least 24 hours in advance to ensure that a CGC employee/designate is on site when the wheat is unloaded. Upon unload, the CGC will take a sample for information purposes and will monitor the flow of the U.S. wheat into the bin(s). The CGC employee/designate will seal the bin(s) to ensure that the U.S. wheat is identity preserved..” (<http://www.cgc.ca/views/tradenotices/uswheat99-e.htm>)
- “When facilities are ready to discharge U.S. wheat, they must contact the CGC’s Prairie Region Office, at least 24 hours in advance, to ensure that a CGC employee/designate is on site upon discharge. When the wheat is discharged, the CGC employee/designate must unseal the bin(s), and collect a sample for information purposes. The CGC employee/designate will monitor the outward flow of grain to the truck or railcar.” (<http://www.cgc.ca/views/tradenotices/uswheat99-e.htm>)
- “Upon discharge to railcars, facilities must provide the CGC s Prairie Region Office with a list of car numbers that U.S. wheat is loaded to and indicate the destination(s). If U.S. wheat is loaded to trucks, the CGC s Prairie Region Office must be provided with the vehicle license number(s) of the truck and trailer, as well as the destination(s). If wheat is shipped to another primary elevator facility, monitoring its movement into and out of the facility as outlined above is required. If U.S. wheat is shipped to a feedlot, the wheat must be denatured. Additional requirements apply to U.S. wheat shipped to a processing facility or a terminal elevator.” (<http://www.cgc.ca/views/tradenotices/uswheat99-e.htm>)
- “Primary elevators must issue cash purchase tickets to U.S. producers upon receipt of U.S. wheat. Cash purchase tickets must indicate U.S. wheat. U.S. producers will be eligible for

²⁰The CGC requires maintaining the integrity of Canada’s grain quality control system, (i.e., prevent commingling of U.S. and Canadian wheat) for Canadian licensed primary elevators handling wheat from the United States.

²¹Appendix 10 is the application form for Phytosanitary Certificate for Export.

security. The rules are the same as those for Canadian grain.”
(<http://www.cgc.ca/views/tradenotices/uswheat99-e.htm>)

- “If the CGC is advised of a shipment of U.S. wheat into Canada and the shipment is misdirected and does not arrive at the designated primary elevator facility, the CGC will contact the proper authorities and will take legal action. Any CGC expenses incurred as a result of a "no-show" or a delayed shipment of U.S. wheat will be charged to the primary elevator facility.” (<http://www.cgc.ca/views/tradenotices/uswheat99-e.htm>)
- “Mixing of Canadian and U.S. wheat at a primary elevator facility is prohibited, including at the time of discharge. If U.S. wheat is cleaned at a primary elevator, U.S. screenings must be kept separate from Canadian screenings unless destined to pellet mills or feedlots.” (<http://www.cgc.ca/views/tradenotices/uswheat99-e.htm>)
- “Facilities are required to report receipts and shipments of U.S. wheat in the *Weekly Report of Grains at Primary Elevators* which is submitted weekly to the CGC’s Statistics Unit (pursuant to Section 27 of the Canada Grain Regulations).” (<http://www.cgc.ca/views/tradenotices/uswheat99-e.htm>)
- “Facilities will be responsible for all fumigation costs if an infestation occurs. In the event of karnal bunt contamination, facilities will also be responsible for all cleaning and shutdown costs.” (<http://www.cgc.ca/views/tradenotices/uswheat99-e.htm>)
- “Failure to Comply: Failure to comply with the requirements in this Memorandum could result in revocation of license, prosecution, or the CGC refusing to give further permission to facilities to receive U.S. wheat.” (<http://www.cgc.ca/views/tradenotices/uswheat99-e.htm>)

The CGC costs of monitoring U.S. wheat will be covered by Agriculture and Agri-Food Canada (AAFC) and the Canadian Department of Foreign Affairs and International Trade (DFAIT) during the initial stages of the Wheat Access Facilitation Program. Under this program, U.S. wheat released by Canadian Customs at the border is considered to be "entering for consumption in Canada." If it is later re-exported, the exporter will be required to obtain a CWB export license.

However, the program has not enhanced wheat export to Canada because of troublesome and particular requirements. The requirements could be regarded as trade barriers. Under the program started in 1999, no wheat has been moved from the United States to Canada. It is necessary to remove or revise the CGC requirements to allow grain shipments from the United States to Canada.

5.3. Elimination of Rate Caps

Because of the rate cap, Canadian shipping rates to export position are now substantially less than from comparable U.S. origins. Table 14 shows transportation rates of 5 representative origins and 6 representative export or market positions in the United States and Canada. Rates for shipping to common U.S. destinations show less disparity. Caps only apply to grains grown in western Canada; technically, they would not apply to grains grown in the northern United States and trucked into Canada. The elimination of rate caps was recommended by Estey, conditional on acceptance of a proposal by CP providing for a 'guaranteed freight revenue reduction' over six years. According to CP, the prospective gains from efficiency and increased competition would allow reduction in freight payments by shippers. (CP also proposed that rail rates be linked to grain prices, so that market risks would be shared by both shippers and railroads.) The CP proposal surfaced in the latter stages of Estey's deliberations and was sufficiently radical that other parties, notably the CWB, have requested more time, beyond the original February 1, 1999, deadline, for evaluation and debate. The CWB has opposed the elimination of rate caps and other Estey recommendations, such as elimination of the car allocation policy group (CAPG).

Table 14. Rates of Representative Barley Shipments

Origins	Destinations					
	Pacific Ports*	Lake Ports**	Tulare CA	Milwaukee WI	Minneapolis MN	Vancouver WA
----- ¢/bu -----						
Camrose, AB	30	69	120	110	91	76
Saskatoon, SK	36	54	127	95	76	83
Winnipeg, MB	60	27	150	68	49	106
Devils Lake, ND	76	49	90	74	49	n.a.
Great Falls, MT	59	77	81	103	77	n.a.
Crookston, MN	76	35	90	61	35	n.a.
Moscow, ID	26	102	n.a.	128	102	26

* Vancouver, BC, or Portland, OR.

**Thunder Bay (Fort Frances) or Duluth/Superior.

n.a. = Not available.

Source: Johnson and Janzen (1999).

Effects of eliminating rate caps are the subject of much controversy in Canada. While the CP offers assurances about lower average rates, the study by Fulton et al. (1998) projected substantial increases in freight rates for grain, particularly in regions where only one railroad is operating. Exports from the West Coast would fall substantially, according to their analysis. Cross-border movements to U.S. destinations might become even more attractive, as they did after the Crow benefit was eliminated. However, it is far from clear how deregulation would affect rates to U.S. destinations, as these partly depend on distributions with terminating carriers. Thus, estimating the net impact on cross-border trade would be quite speculative.

5.4. Reform Package and Likely Future Paths for Canadian Rationalization

As mentioned before, the government of Canada is trying to create a more efficient, accountable, and competitive GHTS that will cut costs for western Canadian grain producers. After extensive consultations with both the Estey and Kroeger Reports, Canadian Transport announced the reforms. Possible multi-level effects, created by the reform package, would enforce the grain flow from Canada to the United States. Likely paths for modernizing the Canadian GHTS are largely based on recommendations by both the Estey and Kroeger Reports. The recommendations would represent major changes in the Canadian system. Among these changes, 'port buying' by the CWB, which would remove the Board's control over internal logistics and shipping, and replacement of the current maximum railway rate scale with a cap on annual railway revenues for grain shipments will have great effects. However, it is notable that port buying is a concept promoted and described strictly with respect to executing off-shore export contracts. No reference has been made yet as to how this would be implemented for trade within North America. These proposed changes are motivated by a desire to improve system efficiency through increased competition and accountability.

6. Concluding Remarks

Grain handling and transportation systems (GHTSs) are some of the important issues of the agricultural agenda in the United States - Canada Free Trade Agreement (CUSTA). There are significant differences in the GHTSs between the United States and Canada. The two countries have developed very different systems over the last several decades. Recently the GHTSs in the two countries have rapidly developed to compete for domestic markets in Canada and the United States under CUSTA and also for global markets. It is important to compare the structure, regulatory practices, reforms, and efficiency of both GHTSs because they directly affect the competitive position of grain producers in each country; grain producers are highly dependent on rail transportation to move grains long distances to export ports. Under CUSTA, there is growing pressure to harmonize the GHTSs and diversify delivery options.

The U.S. GHTS has experienced extensive deregulation with many marketing and transportation options and has evolved toward a commercial model within a competitive environment framework since the 1980s. As a result, investment, new technologies, and deregulation have brought substantial increases in the volume of grains shipped and decreases in railway freight rates. The

Canadian GHTS is undergoing substantial changes based on the Estey Report and the Kroeger Report. On May 10, 2000, Canadian Transport announced the government's intention to introduce measures to increase efficiency and cut costs in Canada's GHTS. The reforms have been implemented beginning August 1, 2000.

Because the grain industries in both countries face long distance hauls for both domestic and export shipments, GHTSs are critically important to their operations and to producer returns. The Canadian and U.S. GHTSs are based on very different regulatory structures. In Canada, grain handling and transportation issues are very important in the agricultural industry, and the reforms have been implemented to increase efficiency and cut costs in Canada's GHTS. In the United States, farmers and grain handlers are searching for higher grain prices, lower operating costs, and access of U.S. grains to Canadian markets.

The Canadian agricultural industry is heavily dependent on reliable rail service to compete in world markets. For grains, the long distances from the Prairies to major export ports and the bulky nature of the products give rail an inherent advantage over trucking. Although the average length of haul and rates for Canadian grain movement have decreased due to abandonment of branch lines during the last several years, the average length of haul and rate are still significant factors in Canadian grain movement. Based on Canada's current infrastructure, approximately 85 percent of grain delivery points are within 50 miles of a competing railway. It suggests that trucking premiums and a large scale trucking program could be implemented to move grain between CN and CP and even to the main east-west BNSF line, which lies just south of the U.S. border. Large grain companies have the ability to truck between competing railways. The North American Free Trade Agreement (NAFTA) allows grain shipments from domestic to a transborder pattern.

Reciprocal access is the issue developed recently under the December 1998 *Record of Understanding with Canada*. The Canadian Food Inspection Agency (CFIA) simplified handling requirements for U.S. grain by accepting a certificate of origin instead of a Phytosanitary Certificate (with declarations for freedom from dwarf bunt, flag smut, and Karnal bunt) for grain that meets all conditions agreed between two countries. Under the program, U.S. producers and shippers have better transportation access to final West Coast destinations in the United States.

In North Dakota, there are no large differences in rail rates from North Dakota to West Coast destinations between BNSF and CP (the former Soo Line Railroad). The elevator managers on the BNSF and CP lines use the in-transit program because of availability of railcars. The freight rate is consistent across the state for west bound shipments on both railroads but differs for east bound shipments.

Access to Canadian primary elevators is a vital element for U.S. producers to enhance opportunities for grain sales to Canada. The Canadian Wheat Access Facilitation Program (WAFP) is to improve access for U.S. grain producers and other sellers to the grain handling and consumption system in Canada. Wheat producers from approved areas in Montana and North Dakota or grain handlers of wheat produced in those areas could benefit from WAFP. Before admitting the wheat into

Canada, Canadian Customs officers will verify the required documents. In addition to these required documents, there are more complicated and cumbersome requirements by CGC that can be considered as a trade barrier. The program has restricted wheat export to Canada. Under the program started in 1999, no wheat has moved from the United States to Canada. To enhance wheat export from the United States to Canada, it is necessary to remove some of the CGC requirements.

Canadian Transport announced the reforms based on both the Estey and Kroeger Reports. Possible multi-level effects, created by the reform package, would affect the grain flow from Canada to the United States. The most significant reforms include 'port buying' by the CWB, which would remove the Board's control over internal logistics and shipping, and replacement of the current maximum railway rate scale with a cap on annual railway revenues for grain shipments. However, it is notable that port buying is a concept promoted and described strictly with respect to executing off-shore export contracts. No reference has been made yet as to how this would be implemented for trade within North America. These proposed changes are motivated by a desire to improve system efficiency through increased competition and accountability.

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APPENDIX

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Appendix 1. Manitoba Truck Types

Manitoba Truck Types

Configuration	Truck Type	Axles
	Single Axle	2
	Tandem Axle	3
	Tractor-Trailer (Tandem)	5
	Tractor-Trailer (Tridem)	6
	Tractor-Trailer (A Train)	7
	Tractor-Trailer (Super B)	8

Source: Prentice, Kosior, and McLeod 1996, 54.

Appendix 2. Application Form for the State of Origin Certificate for In-Transit Grain Shipments

APPLICATION FOR STATE OF ORIGIN CERTIFICATE FOR IN-TRANSIT GRAIN SHIPMENTS

The State of Origin Certificate-in-Transit may only be used for grain (wheat, oats, barley, rye, triticale) that originated and was grown in Minnesota, North Dakota, and approved counties of Montana that will transit by rail through Canada and return to the United States, and will not be unloaded in Canada.

Conditions

1. The grain shipment described on this application was grown and originated in the area listed on this application.
2. The railcar(s) listed on this application was (were) completely cleaned of any residues of previous consignments carried in the rail car(s) prior to loading the grain identified on this application.

Name of elevator		Telephone	
Location of Elevator		Facsimile	
Mailng address	City	State	Zipcode

Type of Grain	
Quantity (pounds)	
Number of Railcars	
Origin: State and county where grain originated and was produced	
Railcar Numbers	
Port of Entry (circle one)	<input type="checkbox"/> North Portal <input type="checkbox"/> Emerson <input type="checkbox"/> Windsor

I Certify that this information on this application is true and affirm that the conditions listed have been met.		
Name of Elevator Agent (print neatly)	Signature of Elevator Agent	Date

North Dakota Department of Agriculture - Bismarck Office
600 East Boulevard
Bismarck ND 58503-0020

Telephone (701) 328-4765

Facsimile (701) 328-4567

North Dakota Department of Agriculture - Fargo office
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Box 5346
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Telephone (701) 239-7295

Facsimile (701) 221-8557

Appendix 3. State of Origin Certificate - In-Transit



STATE OF ORIGIN CERTIFICATE - IN-TRANSIT
 NORTH DAKOTA DEPARTMENT OF AGRICULTURE
 SFN 51879 (01-00)

800 E Boulevard Ave - Dept 602
 Bismarck ND 58505-0020
 Ph. 701-328-4766
 FAX 701-328-4567

To: The Plant Protection Organization of: CANADA	NUMBER
--	--------

The railcar(s) listed in this Certificate of Origin was (were) completely cleaned of any residues of previous consignments carried in the rail cars(s) prior to loading the grain identified in this certificate. The grain in the rail car(s) listed below was produced and originated in the state(s) and county(ies) listed below.

Canadian Import Permit	
Type of Grain	
Quantity	
Origin: State and county where grain originated and was produced	
Railcars Numbers	

Name of Elevator	Location	State
Elevator Agent		Date

North Dakota Department of Agriculture	Signature of Authorized Officer

White - Shipper's original

Pink - Shipper's Copy

Green - State Copy

Appendix 4. Request for Release Approval

**CANADIAN FOOD INSPECTION AGENCY
REQUEST FOR RELEASE APPROVAL
WESTERN IMPORT SERVICE CENTRE**

**AGENCE CANADIENNE D'INSPECTION DES ALIMENTS
DEMANDE D'APPROBATION POUR MAINLEVÉE
CENTRE DE SERVICE À L'IMPORTATION - OUEST**

CFIA FAX: 1-604-541-3373	INFORMATION: 1-888-732-6222
Send Original Certificates to: Expédier Les Certificats Originaux à:	CFIA/ACIA Emerson Port of Entry P.O. Box 148, Emerson, Manitoba R0A 0L0

Number of pages including cover sheet / Nombre de pages incluant la page couverture: _____

Driver waiting / Camionneur en attente: Yes No or / ou
Estimated arrival time / Heure d'arrivée approximative: _____

Broker / Courtier: _____ FAX / Facsimilé: _____
(or importer / ou importateur)

Contact Name / Personne ressource: _____ Telephone / Téléphone: _____

TRANSACTION NO.

Importer / Importateur: _____ Port of Entry / Port d'entrée: _____
Delivery address // Inspection location /
Adresse de livraison // Lieu d'inspection: _____

Commodity / Produits: _____

AND FOR MEAT SHIPMENTS / ET POUR EXPÉDITIONS DE VIANDE

Name and number of approved reinspection point /
Nom et numéro d'établissement du lieu de ré-inspection: _____

SHIPMENT/ EXPÉDITIONS

Container No. / Bill of Lading No. /
No. de conteneur: _____ No. de connaissement: _____

Trucking Company _____ Trailer Lic. No. or Trailer No. _____

COMMENTS AND ADDITIONAL INFORMATION / COMMENTAIRES ET RENSEIGNEMENTS SUPPLÉMENTAIRES

PAYMENT METHOD / METHODE DE PAIEMENT

CFIA Client Account No. /
No. de compte client d'ACIA: _____

Customs to collect / Payer aux Douanes:
Cash/Complant: Cheque/Cheque:

VISA MASTERCARD Card#: _____
Expiry Date / Date d'expiration: _____

Cardholder Name / Titulaire de la carte: _____

For IMPORTATIONS PRESENTED AFTER 23:00 hrs PACIFIC TIME /
Pour IMPORTATIONS PRÉSENTÉES APRÈS 23:00 hrs HEURE DU PACIFIQUE:
Overtime charges billed to Account No. /
Frais de surtemps chargés au no. de compte: _____

Overtime charges approved by /
Surtemps autorisé par: _____

Revised: November 28, 1998

**Inspector's Stamp & Signature
Sceau et signature de l'inspecteur**

Appendix 5. Cargo Control Document

DATE:
PAGE #
CANADIAN PACIFIC RAILWAY CARGO CONTROL DOCUMENT
ACQUITTAL NUMBER: BROKERS BARCODED STICKER
*** PRELIMINARY MANIFEST *** PARS/INPARS PROCESSING
RAILWAY CARRIER CODE : 6105 (CANADIAN PACIFIC RAILWAY)
ETA : 12:00
CARGO CONTROL NUMBER : 6105ES00115948000808
PREVIOUS CARGO CONTROL NUMBER : N/A
WAYBILL NUMBER : 169876
WAYBILL DATE : 00/08/08
RAIL UNIT INITIAL AND NUMBER : SOO 00115948
CONTAINER/TRAILER INITIAL & NUMBER :
U. S. PORT OF EXIT : NOYES MN (03402)
LOADED OR EMPTY : L (LOADED)
LOCAL OR THROUGH : T (IN TRANSIT)
MANIFESTED FROM : EMERSON MB 0502
MANIFESTED TO : KINGSGATE BC 0818
LOCATION OF GOODS :
ORIGIN STATION NAME : LOMA ND
DESTINATION NAME : KEYES CA
COUNTRY OF ORIGIN OF GOODS : N/A
COUNTRY OF DESTINATION OF GOODS : UNITED STATES OF AMERICA
SHIPPER'S NAME AND ADDRESS : CHSC
6000 CENTRAL RD
IGH MN 55000 US
CONSIGNEE NAME AND ADDRESS : ALGC
4000 JEEP RD
KEYES CA 95000 US
NOTIFYING PARTY :
NUMBER OF PACKAGES/PIECES : 1 PCS
WEIGHT/UNITS : 180000 LB
DESCRIPTION/HS CODE :
BARLEY
SHIPPERS LOAD AND COUNT : YES
SEAL NUMBERS :
HAZARDOUS GOODS INDICATOR :
CUSTOMS BROKER : UNKNOWN
Manifest status: ACTIVE Date: 2000/08/09 Time: 18:03

* This document is reproduced based on one of real cargo control documents of Canadian Pacific Railway.

Appendix 6. Participating Canadian Elevators of the Wheat Access Facilitation Program

Company	Elevator	Distance from Border(Miles)	Nearest Border Crossing
Agricore	Letellier, MB	10	Emerson, MB
Agricore	St. Jean, MB	16	Emerson, MB
Pioneer	Mollard, MB	60	Emerson, MB
Cargill Ltd.	Elm Creek, MB	60	Emerson, MB
Pioneer	Brandon, MB	60	Boissevain, MB
		120	Emerson, MB
Pioneer	Carnduff, SK	20	Carievale, SK
Pioneer	Northgate, SK	0	Northgate, SK
Louis Dreyfus CDA Ltd	Rathwell, MB	70	Emerson MB
Louis Dreyfus CDA Ltd	Virden, MB	90	Boissevain, MB
Saskatchewan Wheat Pool	Estevan, SK	23	North Portal, SK
		10	Estevan Hwy., SK
Pioneer	Estevan, SK	35	North Portal, SK
		12	Estevan Hwy., SK
Cargill Ltd.	Rowatt, SK	97	Regway, SK
Saskatchewan Wheat Pool	Coronach, SK	12	Coronach, SK
Cargill Ltd.	Moose Jaw, SK	150	North Portal, Oungre, Regway(all in SK)
Saskatchewan Wheat Pool	Moose Jaw, SK	110	Coronach, SK
Saskatchewan Wheat Pool	Assiniboia, SK	53	West Poplar River, SK
		55	Coronach, SK
Pioneer	Fife Lake, SK	50	Regway, SK
		120	North Portal, SK
Saskatchewan Wheat Pool	Rock Glen, SK	34	Coronach, SK
		30	West Poplar River, SK
Pioneer	Kincaid, SK	75	West Poplar River, SK
		83	Monchy, SK
Pioneer	Swift Current, SK	92	Monchy, SK
Saskatchewan Wheat Pool	Bracken, SK	22	Monchy, SK
		28	Climax, SK
Saskatchewan Wheat Pool	Climax, SK	14	Climax, SK
Saskatchewan Wheat Pool	Frontier, SK	23	Climax, SK
Pioneer	Eastend, SK	50	Climax, SK
		120	Coutts, AB
Agricore	Warner, AB	25	Coutts, AB
Pioneer	Taber, AB	60	Coutts, AB
Cargill Ltd.	Lethbridge, AB	60	Coutts, AB
Pioneer	Lomond, AB	98	Coutts, AB
Pioneer	Vulcan, AB	98	Coutts, AB

Source: <http://www.fas.usda.gov/info/factsheets/canwheat.html>

Appendix 7. Canada Customs Form B3

PROTECTED FORM / FORME PROTEGEE

1. IMPORTER NAME AND ADDRESS NOM ET ADRESSE DE L'IMPORTATEUR		3. STRAIGHT OR NO. OF THE TRANSPORT	
10. CAN. NO. OF INVOICE N. O. DE LA FACTURE	11. VEHICLE MAKE - NOM DU VEHICULE	12. MOTOR ORIGIN N. O. D'ORIGINE	13. ELECTRICITY ELECTRICITE
14. UNIT OF MEASURE UNITE DE MESURE	15. WEIGHT - POND POIDS	16. UNIT VALUE UNITE DE VALEUR	17. WEIGHT - POND POIDS

21. LINE LOGIC	22. CLASSIFICATION NO. BY CLASSMENT	23. UNIT VALUE	24. QUANTITY	25. WEIGHT BY ELECTRICITY	26. MOTOR ORIGIN	27. ELECTRICITY	28. UNIT VALUE	29. WEIGHT - POND	30. UNIT VALUE	31. WEIGHT - POND	32. UNIT VALUE	33. WEIGHT - POND	34. UNIT VALUE	35. WEIGHT - POND	36. UNIT VALUE
21. LIGNE LOGIQUE	22. NO. DE CLASSIFICATION	23. VALEUR UNITE	24. QUANTITE	25. POIDS ELECTRICITE	26. ORIGINE MOTEUR	27. ELECTRICITE	28. VALEUR UNITE	29. POIDS	30. VALEUR UNITE	31. POIDS	32. VALEUR UNITE	33. POIDS	34. VALEUR UNITE	35. POIDS	36. VALEUR UNITE

DECLARATION OF ORIGIN DECLARATION DE L'ORIGINE		40. DETAIL - DETAIL		41. CAN. NO. OF INVOICE N. O. DE LA FACTURE	
DECLARE THE PARTICULARS OF THIS DOCUMENT IN FULL, ACCURATE AND COMPLETE. DECLAREZ LES DETAILS DE CE DOCUMENT EN TOUTE PRECISION, EXACTITUDE ET COMPLETITUDE.		42. CAN. NO. OF INVOICE N. O. DE LA FACTURE		43. CAN. NO. OF INVOICE N. O. DE LA FACTURE	



Appendix 8. Canada Customs Invoice

Canada Customs and Revenue Agency		Agence des douanes et du revenu du Canada		CANADA CUSTOMS INVOICE		FACTURE DES DOUANES CANADIENNES	
1. Vendor (name and address) - Vendeur (nom et adresse)				2. Date of direct shipment to Canada - Date d'expédition directe vers le Canada			
4. Consignee (name and address) - Destinataire (nom et adresse)				3. Purchaser's name and address (if other than consignee) - Nom et adresse de l'acheteur (si différent du destinataire)			
3. Transport or other mode and place of direct shipment to Canada - Transport et mode et lieu d'expédition directe vers le Canada				9. Conditions of sale and terms of payment (i.e. sale arrangements, payment terms, etc.) - Conditions de vente et modalités de paiement (p.ex. ventes, expédition en consignation, modalités de marchandises, etc.)			
11. Number of packages - Nombre de colis				12. Specification of commodities (and of packages, marks and numbers, general description in French and English) - Désignation des articles (marques, numéros, description générale en français et en anglais)		13. Quantity (units and Canada) - Quantité (unités et Canada)	
						14. Unit price - Prix unitaire	
						15. Total - Total	
18. If any of fields 1 to 17 are included on an assigned commodity code, check the box - Si tout ou partie des renseignements aux champs 1 à 17 figure sur une ou des catégories commerciales désignées, cocher cette case				16. Total value - Prix total		17. Invoice total - Total de la facture	
19. Exporter's name and address (if other than vendor) - Nom et adresse de l'exportateur (si différent du vendeur)				20. Originator (name and address) - Exportateur (nom et adresse)			
21. CCR/Origin (if applicable) - Désignation de l'Agence d'origine				22. If fields 23 to 25 are not applicable, check this box - Si les champs 23 à 25 sont sans objet, cocher cette case			
23. If included in field 17 Invoice amount - Si compris dans le total à la zone 17, précisez :		24. If not included in field 17 include amount - Si non compris dans le total à la zone 17, indiquez :		25. If not applicable - Cocher (0) si non applicable			
(1) Transportation charges, insurance and insurance from the place of direct shipment to Canada - Les frais de transport, d'assurance et d'assurance de la place d'expédition directe vers le Canada. (2) Costs for construction, erection and assembly in Canada - Les coûts de construction, d'érection et d'assemblage au Canada. (3) Export packing - Le coût de l'emballage d'exportation		(1) Transportation charges, repairs and insurance to the place of direct shipment to Canada - Les frais de transport, d'entretien et d'assurance jusqu'à la place d'expédition directe vers le Canada. (2) Amount for duty/duties other than duty/taxes - Les montants de droits/droits autres que les droits/taxes. (3) Export packing - Le coût de l'emballage d'exportation		(1) Royalty payments or a royalty proceeds are part of value for the goods - Des paiements de royalties ou des produits de royalties font partie de la valeur des marchandises. (2) The purchaser has incurred costs or expenses in the production of these goods - L'acheteur a encouru des coûts ou des dépenses dans la production de ces marchandises.			
Dans ce formulaire, toutes les expressions désignant des personnes visent à la fois les hommes et les femmes.							

Appendix 9. Canadian Grain Commission Importer Declaration

Importer Declaration - Wheat Imports from the United States into Canada Déclaration de l'importateur - Projet pilote visant les importations de blé des États-Unis au Canada	
To be Completed by the Importer - Révisé à l'importateur	
1. Importer's Name and Address - Nom et adresse de l'importateur	2. Importer's Phone Number - N° de téléphone de l'importateur
3. Point of Entry (Border Crossing) - Point d'entrée (passage de la frontière)	4. Expected Date of Entry - Date d'entrée prévue
5. Description of Wheat Imported - Description du blé importé	6. Quantity (in tonnes) - Quantité (en tonnes)
7. Consignee's Name and Address - Nom et adresse du destinataire	8. Consignee's Phone Number - N° de téléphone du destinataire
9. Wheat Transported By (name and/or company) - Transporteur du blé (nom de la société et/ou de la personne responsable)	
<p>10. I, on behalf of the consignee named above, declare that I have personal knowledge of the matters referred to herein and that I accept the terms and conditions outlined in the CGC's Memorandum to the Trade titled "Canadian Licensed Primary Elevators Handling U.S. Wheat." I certify that the information provided on this form is correct, that I have read and agree to the conditions on the back of this form, and that I have arranged for applicable CGC monitoring upon receipt of the above wheat at the consigned facility. I understand that I am also required to notify the CGC, in advance, if the wheat is to be discharged from the consigned facility to arrange for applicable monitoring. Je déclare, au nom du destinataire susmentionné, que j'ai connaissance des activités dont il est question dans la présente déclaration et j'accepte les modalités énoncées dans la note de service à l'industrie intitulée « Manutention de blé en provenance des États-Unis par des silos primaires agréés du Canada ». Je certifie que les renseignements inscrits sur le présent formulaire sont exacts, que j'ai lu les modalités qui figurent au verso et que je les comprends, et que j'ai pris les dispositions nécessaires pour que la CGC puisse effectuer les contrôles nécessaires à la réception du blé à l'installation désignée. Je comprends que je suis tenu d'aviser la CGC à l'avance lorsque le blé sera déchargé de l'installation afin que la CGC puisse effectuer les contrôles nécessaires.</p>	
Name of Consignee's Authorized Representative (in block letters) Nom du représentant autorisé du destinataire (en lettres majuscules)	Title - Titre
Signature - Signature	Date
For Canadian Grain Commission Use - Révisé à la Commission canadienne des grains	
11.	
Signature of the Chief Grain Inspector Signature de l'inspecteur des grains en chef	
For Customs Use - Révisé au service douanier	
12. Transaction number - N° de l'opération	13. Date Stamp and Initials of Customs Officer of Valuation - Date (tempo) et initiales de l'agent des douanes ayant validé la présente déclaration
14. Vehicle/Trailer License Number(s) - N° de permis du véhicule ou de la remorque	
<p>The information provided on this document is collected under the authority of the Canada Grain Act. Personal and commercial information will be protected under the provisions of the Privacy Act. Les renseignements inscrits sur le présent document sont exigés en vertu de la Loi sur les grains du Canada. Les renseignements de nature personnelle et commerciale seront protégés aux termes de la Loi sur la protection des renseignements personnels.</p>	

Appendix 10. Application Form for Phytosanitary Certificate for Export

No Phytosanitary Export Certificate can be issued unless an application is completed (7 CFR 262).



FORM APPROVED
OMB NO. 0519-0052

U.S. DEPARTMENT OF AGRICULTURE ANIMAL AND PLANT HEALTH INSPECTION SERVICE PLANT PROTECTION AND QUARANTINE		(INSTRUCTIONS: APPLICANT - Forward original to Officer In Charge where inspection, treatment and certification will be given (Form 7). Complete items 1 thru 11. OFFICER - Complete items 12 thru 17.	
APPLICATION FOR INSPECTION AND CERTIFICATION OF DOMESTIC PLANTS AND PLANT PRODUCTS FOR EXPORT			
1. NAME AND ADDRESS OF EXPORTER		3. NAME AND ADDRESS OF APPLICANT (if different agent)	
2. NAME AND ADDRESS OF FOREIGN CONSIGNEE		TEL. (AG)	
		4. PLACE WHERE ARTICLES WILL BE MADE AVAILABLE FOR INSPECTION AND/OR TREATMENT AND CERTIFICATION (Port and location)	
		5. APPROXIMATE DATE OF DEPARTURE	6. PORT OF EXPORT
7. DESCRIPTION OF ARTICLES TO BE CERTIFIED			
a. QUANTITY AND NAME OF PRODUCE AND BOTANICAL NAME			
b. NUMBER AND DESCRIPTION OF PACKAGES			
c. DISTINGUISHING MARKS			
d. CERTIFIED ORIGIN			
8. DECLARED MEANS OF CONVEYANCE		I certify that the origin (place where grown) of the articles listed is as represented.	
9. DECLARED POINT OF ENTRY		10. SIGNATURE (applicant or export agent)	11. DATE
EXPORT INSPECTION DATA - (To be filled in by Plant Protection and Quarantine Officer)			
12. LOCATION OF ARTICLES		13. % OF MATERIALS EXAMINED	14. % OF MATERIALS INFESTED
15. FINDINGS AND/OR TREATMENT GIVEN (Use reverse if necessary)			
16. SIGNATURE		17. DATE AND TIME INSPECTED	

PPQ FORM 571 (FEB 51) Replaces PPQ FORM 573 (AUG 74) which may be used

Appendix 11. USDA Phytosanitary Certificate

46 Phytosanitary Certificate on model and annotation completed by CPH 153. See reverse for additional instructions. Form 577-2002 QW/NO 8119 1002

UNITED STATES DEPARTMENT OF AGRICULTURE ANIMAL AND PLANT HEALTH INSPECTION SERVICE PLANT PROTECTION AND QUARANTINE		FOR OFFICIAL USE ONLY
PHYTOSANITARY CERTIFICATE		
TO: THE PLANT PROTECTION ORGANIZATION(S) OF		
PLACE OF ISSUE	NO.: DATE ISSUED	
CERTIFICATION		
This is to certify that the plants or plant products described below have been inspected according to appropriate procedures and are considered to be free from quarantine pests, and practically free from other injurious pests; and that they are considered to conform with the current phytosanitary regulations of the importing country.		
DISINFESTATION AND/OR DISINFECTION TREATMENT		
1. DATE	2. TREATMENT	
3. CHEMICAL NAME AND BRAND	4. DURATION AND TEMPERATURE	
5. CONCENTRATION	6. ADDITIONAL INFORMATION	
DESCRIPTION OF THE CONSIGNMENT		
7. NAME AND ADDRESS OF THE EXPORTER		8. DECLARED NAME AND ADDRESS OF THE CONSIGNEE
9. NAME OF PRODUCE AND QUANTITY DECLARED		10. BOTANICAL NAME OF PLANTS
11. NUMBER AND DESCRIPTION OF PACKAGES		12. Distinguishing Marks
13. PLACE OF ORIGIN		14. DECLARED MEANS OF CONVEYANCE
		15. DECLARED POINT OF ENTRY
Any intentional false statement in this phytosanitary certificate or misrepresentation relative to this phytosanitary certificate is a violation of law, punishable by a fine of not more than \$10,000, or imprisonment of not more than 4 years, or both. (18 U.S.C. §1001)		
ADDITIONAL DECLARATION		
		
16. DATE ISSUED	17. NAME OF AUTHORIZED OFFICER (Type or Print)	18. SIGNATURE OF AUTHORIZED OFFICER
No financial liability shall attach to the United States Department of Agriculture or to any officer or representative of the Department with respect to this certificate.		

PPQ FORM 577 (JUN 88) Previous editions of APC forms may be used. PART 1 - SHIPPER'S ORIGINAL