"FIELDS ON WHEELS"

Proceedings of the Second Annual Agribusiness Logistics Conference
Held at Winnipeg, Manitoba
Monday, November 24\textsuperscript{th}, 1997

Edited by
Dr. Barry E. Prentice, Wade Derkson and Michael Butt

Occasional Paper No. 16

Transport Institute, University of Manitoba
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Like transportation, effective and efficient agribusiness logistics is a key to the economic and business development of the region. The idea behind establishing the first *Fields on Wheels* conference in 1996 was to introduce new ideas in the areas of transportation and logistics, marketing and economics into the Agri-business community. It was meant provide a forum for discussion and debate on the future of the agriculture and transportation industries which are, of course, inextricably linked.

The Second Annual *Fields on Wheels* conference was held in recognition of Vic Stechishin, a longtime supporter of the transportation industry, who recently passed away. Proceeds from the conference went toward a scholarship fund for transportation and logistics education.

The Hon. Glen Findlay, Manitoba Minister of Highways and Transportation opened the conference by commenting on the many changes to the transportation landscape in Manitoba and what this means for agriculture. Infrastructure issues, specifically highways, are the Department’s major concern, particularly in light of the failure of the Federal Government to alter existing resource taxation and reallocation schemes that only return a small portion of monies to the system.

Dr. Daryl Kraft, Head of the Department of Agricultural Economics and Farm Management was an able chair of the morning session on the Logistics of Milk Pick-Up and Delivery to Dairy Plants. Technological and institutional change have contributed to more efficient milk supply management. The problems of the past (overlapping truck routes and cross-hauling) have been eliminated through many years of diligent work by the Manitoba Milk Producers Marketing Board, in particular its supervisor of transportation, Raymond Rudy.

The second morning session was on the logistics of exporting forages and straw. Rudy Schmeichel, a consultant and innovator, suggested ways for producers to improve the quality of their product and penetrate new markets. He urged producers to embrace new Information Technologies as a means to more efficient supply chain management.

Bruce Graham, General Manager and C.O.O of Linnet Geomatics, an international leader in GIS business systems, outlined the role that GIS technology could, and most assuredly will, play in the agri-business industry of the future. GIS technology offers solutions to a growing number of information-related problems related to industry trends such as proliferation of wheat grades. There are now 27 grades of hard red spring milling wheat, 14 of durum, and 12 of barley. With insufficient terminal space, blending different lots cuts down on the number of choices available to the consumer and in so doing handicaps western producers. GIS technology can be used to manage grades and better allocate rail cars. More importantly, GIS is integrated with all business functions (it has a marketing component, an R&D component, a logistics component and a sales component) making it a complete supply management system tailored to the needs of both the producer and consumer.

Dr. Barry E. Prentice, Director of the Transport Institute, presented the research findings of the first ever survey of the western Canadian pulse and special crops industry. His presentation was followed by a reaction panel made up of two prominent persons from industry: Robert Tisdale, Manager Special Crops, XCAN Grain Pool Ltd. and; Dave Smith, Branch Manager, Panalpina. Information on the transport of pulse/special crops is very limited, so Dr. Prentice’s research on the transportation and characteristics of these crops is very important and has implications for the grain handling and transportation system more broadly. The future of the industry will be greatly impacted by the increased use of containers.

Robert Tisdale brought a trader’s outlook to the discussion of pulse/special crops. In trying to understand and best serve the needs of the grower and the companies they work for traders see the industry moving clearly away from a “Wheat Board administrative environment to a much more open environment.” The second reaction comment on pulse/special crops came from David Smith of Panalpina, a freight forwarder heavily involved in the export of pulse/special crops. In the 1970s, Smith notes, Panalpina moved 100-200 containers per year. These figures have mushroomed; for the 1994-95 season close to 11,000 containers were shipped. However, the industry is faced with a number of supply chain challenges, the most significant of which is container availability and an imbalanced market.
This year the Transport Institute was proud to host the first Kent T. Healy Memorial Lecture in Canada as part of the *Fields on Wheels* program. Kent Shoemaker, CEO Red River Valley & Western Railroad (RRVW) delivered the lecture in honour of a longtime educator in transportation economic at Yale University. The topic of the Lecture was short lines, specifically the story of RRVW’s success in making short haul grain profitable. His message was not lost on conference participants and Mr. Shoemaker essentially framed the discussion for the remainder of the conference, which was devoted to grain transportation and marketing.

Dan Stirling opened the afternoon session with the topic of “Railway Restructuring.” As Director of Grain with CP Rail, Mr. Stirling was the ideal person to summarize the myriad changes to the grain supply chain, admittedly from a railway perspective. The conference was fortunate to have Paul Earl from Western Canadian Wheat Growers and Gene Griffin, Director of the Upper Great Plains Transport Institute present to keep the discussion lively. Surprisingly, there was widespread consensus that the long standing issues of the subsidy and the rate cap are finally being sorted out. Many of the conference participants had the 1999 rate review by the CTA foremost in mind.

The final session was by Brian White of the Canadian Wheat Board who wisely observed that even when the Wheat Board is not on the program they are on the program, or at least on everyone’s mind. Mr. White avoided controversy, however, and delivered an excellent summary of the Board’s forecast to the year 2007. The forecast was warmly by reaction panelist Lance Norman from OmniTRAX, who concluded that it ensured the long-term viability of the Hudson Bay Railroad (HBR) and Hudson Bay Port Company (and the town of Churchill). The other reaction panelist, Dave Gardiner, President of WESTAC, briefly stated the position of the west coast ports in the whole grain handling matter. The last word of the conference went to former Minister of Agriculture, Charlie Mayor. He urged stakeholders to continue the transition toward a market-oriented supply chain and a grain handling system more responsive to customer needs.
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Good Morning, my name is Barry Prentice, I am the Director of the Transport Institute at the University of Manitoba. I would like to welcome you all to the second annual Fields on Wheels Agribusiness Logistics Conference which is jointly sponsored by the Transport Institute and the Department of Agricultural Economics at the University of Manitoba. This is a special conference today because it is dedicated to the memory of one of the pillars of the transportation community who just recently passed away, Vic Stechishin. The proceeds from the conference will be donated towards a scholarship in his name at the University of Manitoba for at student in the Certificate in Logistics Program. I would like to say a few words about Vic and then read aloud some comments from some of his friends.

Few individuals have made as great a contribution to transportation issues facing Western Canada as Vic Stechishin. He was intensely involved in all areas of transportation and worked tirelessly to improve professionalism in the field. He began his career in 1941 when he assumed responsibility for transportation at the Number 7 Equipment Depot of the Royal Canadian Air Force. He was a founding member and President of the Winnipeg Transportation Club in 1958, 59 and 1960. He was the President of the Canadian Transportation Research Forum in 1977 and 78. He was the National President of the Canadian Institute of Traffic and Transportation in 1963/64. He conducted a course on traffic and transportation with the Extension Department at the University of Manitoba. He was an associate of the Winnipeg Chamber of Commerce for 50 years. Vic served as an expert witness before five Royal Commissions on transportation and was a research consultant to the Royal Commission on Northern Transportation. In 1965 he traveled to Thailand on assignment under the Colombo Plan and was on the United Nations List of approved International Consultants. I think some of the comments from people who made contributions to the scholarship fund speak louder to his character than I can. The first comment is an excerpt from a letter I received from Craig Dickson:

I was saddened to learn of Vic’s death. I first met him in 1960, but prior to that I knew of him and his work with the Manitoba Transport Commission in the mid 1950s. Over the years we worked closely on many transportation issues affecting our respective regions. Vic had some interesting stories and experiences in transportation, including one on how he first became involved in transportation. Prior to World War II Vic had served as a “newsie” on CP passenger trains selling, in his words, “stale sandwiches and cold coffee to passengers.” He subsequently joined the military. When a problem developed in the payment for freight charges for the military supply base in Winnipeg the officer in charge noticed that Vic had worked for the CPR before enlisting and so, in true military fashion, he was placed in charge transportation despite having no training or accounting experience. As he learned his job by trial and error, he realised that transportation
was something that could be managed. As a result, when the war was over he began his career in transportation. And an outstanding career it was!

The next excerpt comes from a letter by Dr. John Heads, Director of the Transport Institute from 1988 to 1992:

I was sorry to learn of Vic Stechishin's passing. Like all of us I held Vic in very high regard for his great knowledge of transportation, his technical expertise, his kindness and warmth, and his delicious sense of humour. Shortly after my arrival in Manitoba I committed the unforgivable error saying he was Russian instead of Ukrainian. He corrected me, saying “John, to call a Ukrainian a Russian is like calling an Englishman a Scotsman. No, it's worse, it's like calling a Scotsman an Englishman.” On another occasion he patiently explained to me that when two Ukrainians were discussing any issue they had at least three points of view. Apart from these gems of general knowledge I learned a great deal from Vic about transportation during the 30 years I had the pleasure of knowing him. He will be sorely missed.

He will be sorely missed, but he will not be forgotten as we are honouring Vic Stechishin with an annual Transportation Scholarship. We appreciate your participation in this scholarship. In fact, the proceeds from this conference will be donated to the "Vic Stechishin Transportation Award".

My next honour is to introduce the Opening Remarks from the Minister of Highways and Transportation, the Honourable Glen Findlay. Mr. Findlay was elected to the Manitoba Legislature in 1986 as MLA for Virden and served as Progressive Conservative chief critic for agriculture. From 1988 to 1990 he served as Minister of Agriculture and Minister responsible for Telecommunication. In 1990 he was elected MLA for Springfield, holding the same responsibilities until 1993 when he was appointed Minister of Highways and Transportation retaining responsibilities for Telecommunication.

Mr. Findlay has a background similar to some of us in this room. He received his B.Sc. in Agriculture and a Masters degree from the University of Manitoba. After receiving his Doctorate in Nutritional Science from the University of Illinois, he did Post Doctorate Research with the National Research Council of Canada. In September 1977 he was a Professor in the Faculty of Agriculture at the University of Manitoba. He returned to full time farming in 1978, and since his election his farm has been operated by his son and daughter-in-law. In addition to his work in professional organisations, Mr. Findlay has been involved in numerous community activities. Glen and his wife Kay have four children and several grandchildren. Please welcome Mr. Findlay.
Honourable Glen Findlay  
Manitoba Minister of Highways and Transportation  

Opening Remarks

Thank you Barry. It is indeed a pleasure to have the opportunity to say a few words to you this morning before you open your conference in recognition of someone who made contributions over many years to the industry. Creating a scholarship is very important in this day and age because of the rising costs of education. I would like to congratulate you on behalf of Premier Filmon and the Government of Manitoba on your Second Annual Agribusiness Logistics Conference. The term "Fields on Wheels" likely has a different ring for me than it does for many of you, as a farmer and as Minister of Highways and Transportation. Today I am going to comment on the challenges we face not only in Manitoba but across every province in this country particularly the prairies. What I see happening is change in every field, in telecommunication, transportation and in agriculture. And I guarantee that in the next ten years yet more will happen. For example, when I was Minister of Telecommunication we were a crown corporation. Now it is served by the private sector, which is as it should be.

Western Canada is one of the bread baskets of the world and, despite disruptions here and there, we have done an excellent job over the decades of moving product to export markets, especially compared to other parts of the world. The grain handling system is particularly complex and involves a high level of integration. Given the unique challenges we face — great distances and harsh weather, for instance — the system does on the whole work very well. We have to recognize there are some problems but must work progressively within the system to find solutions. A good example is the recent change to the Crow benefit. For many decades the Crow rate inhibited diversification and value-added activity in agriculture which would have provided more jobs in Western Canada. Since its elimination there has been a tremendous stimulation of diversification and value-added processing of grain products in Western Canada resulting in the export of higher value products and more jobs beyond the farm gate.

Changes to the Canadian Transportation Act (CTA) have also had an impact on Western Canada's grain transportation system. In particular, the CTA expedites further branch line abandonment meaning more grain will be trucked greater distances (i.e. more truck miles). More truck miles means more jobs in rural positions all across Western Canada. For example, I have seen trucking companies emerge out of nowhere with five trucks expand to twenty or twenty-five trucks in no time.

There has been a tremendous increase in investment in value-added industries throughout Manitoba and in the other Prairie provinces. Examples include the Isobord plant in Elie, new oil seed plants, flour mills and french fry processing plants. Generally speaking these developments mean more miles of truck traveling on municipal and provincial roads across the three Prairie provinces. This will add to the challenges we already face in our rural
transportation network. In Manitoba we have a network of some 18,000 kms of roads, and 2800 bridges and structures. I mention bridges and structures because they are a very critical element of the network representing an asset of $5.5 billion. Many of these rural roads and bridges were built in the 1960’s and 1970’s when truck weights were around 44,000 lbs. Today B-trains weigh up to 138,00 lbs! It is not difficult to see that structures built to carry one quarter of the load are having trouble carrying the kind of loads that we run on the roads today.

The primary element of this road network is, of course, our national highway system or the Trans Canada network (Hwy 1, Hwy 16, Hwy 75). Since 1985 we have spent $100 million expanding (to four lanes) Hwy 75 south to the U.S. and the perimeter around Winnipeg. Although Hwy 75 represents only 5 percent of our total road network, it carries 29 percent of all the traffic. Much of that traffic is commercial truck traffic. The provinces have been responsible for a long period of time, with some federal help, to build and maintain this road network, particularly the Trans Canada network. The provinces have been investing as much as they can from available revenues such as fuel taxes. In Manitoba we collect $160 million annually in fuel taxes of which $106 million goes into capital projects (i.e. bridges and roads) and $54 million goes toward maintenance. In other words, we are only investing 2 per cent back into our $5.5 billion asset each year. Clearly the system is deteriorating faster than we can possibly rebuild it from available revenues. In Manitoba we have argued for a long time that the Federal Government has a responsibility to invest back into the system the $5 billion it extracts annually in Canada in the form of fuel taxes. From Manitoba the Federal Government collected some $155 million in fuel taxes in 1996 but none of that revenue will be reinvested into the provincial road network. Indeed, the provinces have argued collectively that the Federal Government has a clear responsibility to reinvest in provincial infrastructure, especially given the impact other federal legislation is having on that infrastructure (i.e. the CTA, branch line abandonment and increased truck traffic).

The Federal Government has contributed some. For example, between 1992 and 1996 $35 million was invested in Manitoba under the Strategic Highway Initiative Program (SHIP). However, now, when pressure on the network is the greatest, the provinces are without help. Of the $140 million infrastructure adjustment fund that was created to help with the effects of elimination of the Crow, only $26 million came to Manitoba. Moreover, the Federal Government has decided that none of those monies should go into road infrastructure, despite the lobbying of the municipalities and farm organisations. This is our great dilemma: we are unable to build; we can only put our money back into the system. For instance, we generally put about $25 million (25 per cent of our capital) into the Trans Canada network each year just to deal with the wear from increased traffic volumes. In allocating funds our first priority is commercial, that is, how can our roads best serve commercial needs. So we look at the roads with the highest commercial traffic volumes — the major PTHs — and try to ensure that they are efficient and competitive.
Since the Free Trade Agreement and NAFTA north-south trade has grown substantially. Manitoba’s exports to the United States have more than doubled since 1990, from $2 billion in 1990 to $4.5 billion in 1996. These numbers are likely to rise yet further in the next few years. Consequently commercial truck traffic on our networks is growing. The trucking industry is also experiencing consolidations, mergers and alliances as firms attempt to remain competitive in the North American market.

Other modes — rail, marine and air — are also changing to meet the needs of today. Clearly all modes are focused on efficiency and cost effectiveness/competitiveness and they must continue to maintain that focus into the next century. For our part in government we have done well up to this point but we must continue to make adjustments in the years ahead if we are to take advantage of opportunities. As I said, however, the big issue for government and for tax payers is whether the provinces should shoulder all the responsibility for maintaining and building provincial road infrastructure. We continue to urge the federal government to take action: either they reinvest the revenues they currently collect from fuel taxes or they let us collect the fuel tax so we can put it right back into roads.

Thank you Barry for the opportunity to say a few words on the government’s role in helping put “fields on wheels.”

Dr. Barry Prentice, Director

Transport Institute, University of Manitoba

Thank you Mr. Findlay for taking the time to be with us this morning. I know you have a very busy schedule and you won’t be able to stay for the whole day, we do appreciate you coming this morning. Certainly the topic that you spoke of is one that is near and dear to the hearts of those who are looking at the changes coming in agriculture and many of the topics that are on the program for today.

Moving on, I would like to introduce the morning sessions’ chair, Dr. Daryl Kraft. I am not going to make a long introduction, except to say that Dr. Kraft is Head of the Department of Agricultural Economics, and my boss. Daryl please.
Thank you Barry and good morning. The term “Fields on Wheels” indicates a combined effort of the Faculty of Agriculture and the Transport Institute, so this morning we are going to hear a lot about the fields component, which is a diverse set of commodities, and their specific transportation characteristics. First we will hear about the transportation of milk, forages and straw and pulse and special crops. Later we will here about a technology that is having a major impact on the logistics of Fields on Wheels — Geographic Information Systems (GIS). Our first speaker is with Manitoba Milk Producers, Raymond Rudy. Ray grew up on a small farm in southeastern Manitoba, moved away shortly after high school and joined the “sure-grow” division of Canada Packers where he cut his teeth in the transportation and traffic area. In 1978 he moved to the Manitoba Milk Producers’ Marketing Board. He is currently the supervisor of transportation with the Manitoba Milk Producers. I came to know of Ray’s work indirectly through my experience in regulating milk prices in the province of Manitoba. I can attest to a number of his skills. The fact that the transportation component of the cost of milk has not increased one cent over the last ten years is testimony to Ray’s capability. In an industry that has faced considerable inflationary pressures he has been able to manage costs for the Manitoba Milk Producers and, of course, for Manitoba consumers. Please welcome Ray Rudy.

Raymond M. Rudy, Supervisor, Transportation
Manitoba Milk Producers

The Logistics of Milk Pickup and Delivery to Dairy Plants

Introduction
Thank you Dr. Kraft. Just imagine what he would have said about me if I had passed one of his courses! As Dr Kraft said, I am an employee of the Manitoba Milk Producers.

Moving bulk milk from farm to market is a logistical process that has evolved in response to multiple factors. The nature of milk as a product makes it extremely time-sensitive. Quality degradation can occur very rapid if milk is not cooled properly on-farm, not kept cool in transit, or mishandled along the way. During the 1960's milk marketing underwent a monumental change, going from storage in individual cans to bulk milk coolers. This precipitated the beginning of bulk milk tanker trucks as a means of transporting the product to market. In Canada this was followed quite closely by the inception of milk supply management. Producer-oriented marketing
authorities were formed to oversee administration of the system. As one can imagine, the transition to orderly marketing was not accomplished quickly or easily. This morning I would like to go over some of this history.

**Overview of Manitoba's Bulk Milk Transportation System**

Milk transportation in Manitoba was built upon a myriad of complex factors. Traditional allegiances between haulers and producers, cooperative membership, and truck operating authorities were all part of the equation. When the Manitoba Milk Producers Marketing Board was formed in 1974 the bulk milk transportation system was characterized by what can only be called organized confusion. Because some milk was designated for fluid use, while other milk was destined for manufacturing use, overlapping truck routes and cross-hauling was endemic. The advent of centralized orderly marketing created opportunities to improve these inefficiencies.

Regulations stipulate that milk must be at a properly cooled temperature in order for pickup to occur. Indeed temperature control is such an important feature of milk production and transportation that standards for storage and transportation equipment) have been developed. In North America these are generally known as “3A” standards. They ensure that product temperature is kept within narrow ranges. Provincial regulations also state that a producer's milk must be picked up from his bulk tank at intervals not exceeding two days. Moreover, the time window for pick up is only eight hours (8:00 a.m. to 4:00 p.m.). In the traditional system, when a bulk milk truck completed its route, it proceeded to an assigned processing plant. Assignment was governed to some degree by the amount of milk required by each facility to meet its market demands.

**Changing Bulk Milk Transportation and Logistics in Manitoba**

An important first step in achieving greater efficiency was instituting the same quality standards for all milk. This was accomplished in Manitoba in 1980. Since then the industry has continued to identify problem areas and implement changes to the bulk milk transportation system. I would like to go through some of these changes.

Steps were taken to re-designate routes (truckloads) to more logical destinations, that is, to plants closer to catchment areas. This reduced unnecessary distances traveled resulting in reduced costs. Another important step was eliminating cross-hauling. I know of cases where there were four different haulers serving four different producers over a very small geographic area. In the worst of these cases carriers eventually initiated their own changes. Naturally they recognized that operating more than one truck, with ample capacity, on a single road segment containing several stops was inefficient. Other route rationalization initiatives further reduced the problem of cross-hauling.
In the early stages of this rationalization process the technology consisted of little more than large scale maps with coloured pins and fourteen column paper pads. These were our data manipulation tools! With developments in computer capabilities and sophisticated software programs data handling and manipulation is now much easier but involves extensive learning and training. If this exhaustive learning curve is not undertaken the ultimate benefits are unattainable. The software used by the Board can generate routes "from scratch," or it can help optimize existing situations by providing rapid solutions to a host of routing and scheduling problems. For example, vehicle utilization and fleet configurations can be optimized by using the best suited vehicle and loading it to capacity on the basis of least-cost sequencing.

However, computer and software technology is not a "magic bullet" — it cannot solve all problems. It is and should be used as a management tool in conjunction with other information sources and application criteria of a less tangible nature. One of the primary benefit of using software as a management tool is that it eliminates or postpones subjective judgement in the decision making process.

Satisfying the requirements of fluid-processing facilities is another area that requires a dedication of resources and personnel. Although fluid plant requirements are fairly static, consumer demand actually governs the amount of raw product needed for processing. As truckloads of milk are assigned to specific plants on the basis of historical patterns, other factors generate the addition of supplies or the removal of surpluses. In assessing plant requirements for a typical week there are variances that need to be accommodated. Dispatch staff establish, as far in advance as possible, actual plant requirements. In some jurisdictions this process is automated with orders placed one week in advance. In Manitoba, with its relatively small market, less advance notice is required. Decisions to draw added supplies or place surpluses are made on a least-cost basis while maintaining plant allocations.

Redirection of truckloads is done prior to the completion of loading, usually at least one day in advance. This gives consideration to scheduling and avoids the problems of overlapping and cross-hauling. Redirecting several vehicles to the same facility at the same time of day can also create unproductive waiting time, adding to transportation costs. Some of the automated software packages have scheduling software to help prevent such conflicts.

In Manitoba, milk is carried from farm to processing plants by drivers contracted to Manitoba Milk Producers. Drivers must hold a valid "bulk milk graders licence" and accept a producer's milk only if it meets all of the grading criteria. In this respect, bulk milk haulers have a greater degree of responsibility for the quality of the product than many other truck drivers.

The vehicles operated range in capacity from tandem axle trucks (11,800 to 14,400 litres), to tandem axle semi-trailers (22,000 to 26,000 litres), and tri-axle (tridem) semi-trailers (28,000 to 29,000 litres). The number of
processing plants these trucks deliver to has decreased from nineteen in 1974 to nine at present. In that time the number of producers has also declined by more than half. As a result product must be trucked ever greater distances. Despite this, the number of trucks in operation has continued to decrease, from fifty-seven in 1974 to today’s fleet of thirty-nine vehicles. This is because of the increase in individual tank capacities (average tank capacity has almost doubled since 1974, from 9,800 litres to 16,450 litres).

Contractors hauling milk are paid on a rate formula basis. In recent years the rate formula concept has undergone two major revisions. The most recent change, adopted in 1991, gave more weight to actual service required, based on fixed and variable costs. There are also incentives for optimizing vehicle capacities and equipment utilization. Revisions to the rate formula created the economic pressure necessary to ignite needed changes.

These changes have had positive effects on transportation costs. For example, under the first rate formula (instituted in 1978) transportation costs were equal to 5.38 percent of the gross pool blend value of one hectolitre (100 litres) of milk. By 1996, after years of diligent negotiation and revisions, transportation costs represented only 3.78 percent.

Fleet configuration and vehicle utilization has also improved substantially. In the past, cases of transporters hauling less than full loads once a day occurred because the system compensated them for it. This no longer occurs. Improved fleet configuration and vehicle utilization means better revenues, particularly in high producer density areas in close proximity to assigned processing plants. Conversely, vehicles not fully utilized will incur negative rate incentives (penalties). This is effective in initiating route rationalization of contiguous service areas by adjoining carriers.

**Future Issues**

The future of farm to plant milk transportation is facing unprecedented challenges. At the farm level, production units are becoming larger, fewer in number and adopting new production methods, such as three times per day milking. This means that the time windows for providing pickup service need to be shorter. Larger farms also produce more milk per pickup. As a result, larger capacity vehicles are required.

Processing plants are also becoming more vigilant regarding costs: reducing workdays per week and daily receiving times. These measures impose further restrictions on the transportation system. To respond, carriers will need to adopt innovative methods and be more flexible if they are to remain competitive. The use of larger capacity equipment operated for longer hours is an option in higher production density areas, but may not be applicable in low density areas.
The use of computers and electronic technology is in its infancy in this sector. In the very near future the use of such tools as routing and scheduling software will become more widespread. Coupling this with automated ordering and electronic data capture will further streamline the supply chain. Economic and competitive pressures are certain to ensure future adoption of these technologies.

Cost containment within the transport sector continues to be a high priority for the current board of directors of Manitoba Milk Producers. In that vein, all stakeholders must recognize the need for more efficient use of equipment, personnel and resources. Perhaps the biggest single challenge confronting the industry is globalization. In particular, recent changes in trade rules ushered in by the World Trade Organization will have a marked effect on supply managed commodities. The dairy industry in Canada continues to restructure in order to remain competitive and retain market share. This process began with an introspective, critical review of the way the industry conducted itself within Canada. The first decision was to break down provincial barriers and form regional pools to share markets and revenues. This opened the door to further plant rationalizations and more efficient use of existing facilities. With raw milk supplies and processed products now able to move more freely between provinces the marketplace is taking on a new complexion. For example, transporting supplies from a catchment area in one province for processing in another presents a new challenge to milk transporters.

While the production sector has adapted quickly to changing market forces, the transport sector has not. In particular, the manner in which milk is moved from farm to plant will have to change. There is every reason to believe that bulk milk transporters will respond to these challenges in a positive manner. Hopefully they will embrace the tools available to them and continue the positive evolution of a very important part of the dairy industry.
Our next presentation deals with the issue of managing and exporting a very bulky commodity — forages and straw. The presenter Rudy Schmeichel is an innovator, a visionary and a promoter of Timothy hay and alfalfa producers and exporters. His current challenge involves bailing, stacking and transporting straw from all over southern Manitoba to the new Isoboard plant to meet production schedules. Rudy has also worked in the area of raising equity capital and brings to this industry an ambition and a vision that I am glad he can share with you today. Please welcome, Rudy Schmeichel.

Mr. Rudy Schmeichel, Consultant
Logistics and Storage for Forage and Straw

For the last 2 years I have dealt mainly with the logistics problems of moving 400,000 bales of straw, measuring 4 x 4 x 8 in dimension, from rural locations all across southern Manitoba to the new Isoboard plant. It is staggering to think that supplying a $150 million plant requires 900,000 miles of transportation services. I approached the problem by looking at current trucking methods. The first thing I looked at was tires. I was happy to discover that there are some very wonderful hi-tech tires out there (however, truckers hate them because they cost a fortune).

Getting alfalfa and Timothy hay into position for use by the dairy industry involves some very complex logistics and, of course, one always has to pay attention to transportation costs. To help contain costs the forage industry needs to take advantage of many of today’s technologies, such as database management tools that come with a PC’s system software.

I also think the industry has the opportunity to increase exports to the United States. One of the things the industry needs, however, at least in Manitoba, is some large storage facilities with good rail access. In Alberta, which exports forages to the Pacific Rim, there are two or three companies operating six or seven large storage/quasi-processing facilities. If Manitoba had one or two of these “super-sheds,” and used the institutional device of the public company to pool resources, the forage industry could provide more consistent supply of quality forages to the dairy industry.

There is currently only one Manitoba producer who has shipped forages by rail on a regular basis. Since there is no point reinventing a marketing channel that already exists, I think a successful strategy for Manitoba producers would be to adopt rail storage in Manitoba and joint-venture with Alberta producers who already have a secure supply chain to Asia through Seattle. The basic point is that despite a highly-capitalized agricultural sector in Manitoba, the
forage industry continues to pile hay bales in mudholes. We are starting to see some smaller sheds, but the costs of building them are a factor. Still, a shed can keep hay from sucking up moisture from the ground, which results in poor quality. In my opinion the forage industry in Alberta has seen that the benefits of storage for forage outweigh the costs.

When I was an alfalfa dehydrator in the mid-1970s the industry was not highly mechanized but now it is. The other big change is with computers which, as I mentioned, are helping alfalfa producers and exporters better understand their total costs. On the forage side we do not yet have as good a handle on total costs. The line-items that I think one has to isolate are seed, fertilizer and raking. You do have to fertilize forage crops if you are going to make them competitive with cereal crops, but you must also account for raking. I spent a significant period of time this summer with forage producers who did not have a line item for raking. They accounted for chemicals (fertilizers), baling, roadside stacking and loading. Then there shipping costs, of course, whether by rail or truck. Total cost accounting can be greatly simplified with the help of database management software and the like.

I would like now to touch upon the kind of machinery that is now available to the forage industry. At Isoboard we introduced a tractor to test in Manitoba – the JCB – which is built in the United Kingdom. It travels 41 mph and when you hook it up to forwarding you have the makings of an inland barge system. One producer was skeptical about the 41 mph figure, saying the tires would get too hot, so I told him about the JCB’s marvelous high tech Michelin tires. They have little conical shapes which give the tire a larger surface area and they have a larger side wall which keeps the tire cool. The tractor has four wheel independent suspension meaning that a plow doesn’t bounce out of control. We tested it on Heston balers (the large 4x4x8 ones) and it was smooth at 41 mph. Turning around the phrase “fields on wheels,” you could say that in the future there will be different wheels on the fields. For example, I still think putting crawler tractors with belted rubber tires on balers is an idea whose time will come. If you consider the capital cost (plus interest rates) of a big horsepower tractor versus the number of cuts, the width of the tires matter. There is a wide tire made by Caterpillar allows you to drive right over a huge swath

Despite these technological improvements, the forage industry still needs better farm implements. For instance, swathers are not built right for our needs, such as laying down a swath so that when it rains the wind blows around the swath. Now, I know that nobody is going to invest $8 million to develop a swather for which there is a market of 17 per year. However, I am optimistic that manufacturers will produce a swather that will allow hay to be laid down in a field so that it can dry more quickly after a rain. This would lower some costs.

Lowering costs is important to the forage industry because the dairy industry is facing a tighter marketplace at the moment and into the near future; bulls are getting more expensive, for example. The marketplace demands new organizational structures and changes, such as immediate shedding of hay and a shed for storage and to prevent
moisture from seeping in from the ground. The equipment to do these things is there, but the industry also requires large and fast tractors in order raise the quality of forages on a consistent basis. For the Isoboard plant we introduced an American-made forage wagon that cost $340,000 (Cdn). That is expensive, but look what it can do! This year I observed a forage wagon operation in Manitoba — where there is only a short period of time to pick-up as many as 400,000 bales from some 600 farms. The best operators were stacking 1150 pound bales at a rate of 86-100 bales per hour — that is production! Unfortunately, only one person in nine is capable of that kind of production, because most of us don not take forages seriously enough. In particular, we have to get serious about how we man our equipment, including how we pay the operators, in order to better utilize that expensive new machinery out there.

In general I am optimistic that we can attract capital to Manitoba and also get the railroads and other groups more interested in our industry. Most importantly, I think forage producers must find a way to share costs and take advantage of opportunity by going forward with a public concept idea. Thank you for your time and attention.

Dr. Daryl Kraft
Morning Chair

Thank you Rudy. Information Systems were touched on by the previous two speakers but now we shift all our attention to them. In logistics the term Information Systems first and foremost means Geographic Information Systems (GIS). Our next presenter, Bruce Graham, is General Manager with Linnet Geomatics, a national and international leader in GIS business applications. Please welcome Bruce Graham.
Bruce Graham, General Manager & C.O.O.
Linnet Geomatics International Inc.

Geographic Information Systems in Agribusiness Logistics

Thank you Dr. Kraft. The theme for today is the supply chain transition that is starting to occur in agriculture and I have a little bit to say about the role that GIS technology is going to play in that process. Before I start, I should mention a story I saw recently in Agri-Week that highlights some of the issues that are behind this supply chain transition. It was about the slow terminal operations at Vancouver and the effect they were having on rail car availability. Basically it said that the chronic mismatching of rail car orders with export requirements is a source of the problem. A major source of difficulty is the large increase in the number of different grades of board grains since protein segregation was defined a couple of years ago. Now there are 27 different grades of hard Red Spring milling wheat, 14 of Durham, and 12 of barley. Terminal space is not sufficient to cope with such an wide array of grades. As a group the terminals are poorly set up to blend different lots to achieve narrow band protein content. As a result, rail cars are being used for spill-over storage meaning the system is operating almost on a direct hit rail-to-ship basis for which it was never designed. That is a basic order of fulfilment problem and I believe that GIS technology can play a very important role in helping to sort out some of the underlying problems.

I first want to give you a brief “commercial” on Linnet so you know who we are. Then I will give an over-view of our involvement with the agriculture business process and how GIS fits into it, along with a specific example of how it is being implemented by a firm Warburtons. Warburtons is a bakery in the United Kingdom that is active here in Manitoba. I will wrap up the presentation with a discussion of an implementation that specifically addresses the order of a fulfilment problem.

I am not sure how many of you are familiar with Geographic Information Systems (GIS), so I will start by saying that they are a system made up of four components. The first is a digital reference map of some sort on which you must register your data to. The second is a piece of software that you would buy from a vendor that typically goes under the name of Geographic Information System, which is in fact a tool kit that you can then load your own data to and try do something with. The other software aspect, necessary for large organizations such as a grain company or a large chemical company which have large graphic data sets, is data distribution technology. The fourth component is called user applications, by which we mean taking the specific business process of the client and customising a GIS system for it. In other words, customizing the reference map, which is fixed, and the off-the-shelf software and assembling the databases required to actually solve specific problems. In this sense we are not talking about GIS systems that are sitting in the back room, but rather actual applications that sit with, for example, the shipment planner (if you were looking at filling an order) or the crop consultant (if he was sitting with a farmer...
deciding how to plan next year’s crop layout, fertilizer and seed requirements, etc). Linnet specializes in that whole realm of activities with the focus on building systems to meet specific business requirements for the end user.

Why is GIS technology important to the agriculture industry? The answer is that agriculture, in the broadest sense, deals with spatial issues. It involves understanding farming practices at the field level and producer intentions on a regional basis. It involves analysing crop performance under specific environmental conditions. For a chemical company or a seed company, determination of market share could be by elevator point, by region, analysis of client and dealer networks. Everything happens at a point on the ground. It is relevant to direct marketing, of course, because the focus is on getting your message to the segment of the farm population that is going to have the most impact on. GIS also supports business analysis and reporting with the range of applications. From a high level view of the business process we can identify four major components. First there are the crop inputs and supply side. Then there are on-farm practices, and the gradual move towards precision farming technology. There is the logistics of getting the product to market. Finally, of course, is the financial processes, and this could involve, say, crop insurance loan portfolio management. All of these business processes can benefit from data sharing in the form of a central GIS database. Everything included in the database is land bases, so there is always a geographic point associated with it. In other words, they are all spatial processes. For instance, if you take the logistic problem, and address it with a precision farming module and a goods movement module, you could know exactly what was produced and where, immediately after the harvest, all across western Canada. If you overlay that map with the transportation network — the railroads and highways — you then start to see solutions to order fulfilment problems.

Let us look at a concrete example of a typical GIS install — this could be a grain company or a chemical company, say. The company has a marketing and sales component, an R&D component, and a logistics component. Underlying these business processes in agriculture are the spatial data sets that support each of these components. In turn, underlying those spatial data sets is a geographic reference base that everything is referenced back to, that is to a point on the ground, whether it is producer profiles, soils information, suppliers influence information, etc. GIS applications are really the interface between these underlying databases and each of the business processes. The point I am emphasizing is that this is not a model in which a technology “expert” sits behind the scenes producing maps. Instead, the applications themselves are focused on each of the business processes.

I would like to step back for a moment and look at the underlying reference base that allows us to relate all activity to a point on the ground. We call it “activity location.” In the context of farming it refers to the point at which something happens on the ground, whether it is seeding, fertilizing, or chemical application — those are more or less database activities. When you start to relate that activity to the larger questions of the fields, regions etc, the location aspect of GIS begins to take effect. It is this relationship that defines product inventory, actually at the lowest level. Once you start to relate what’s happening on the ground to the business processes, from the
agronomic side, to the crop consultant side, to the sales order and the logistic side, you arrive at the concept of the crop being contracted for, directly with an end user. This is essentially what the Agri-Week article was trying to highlight.

In a model like this it does not matter how many pieces are in-between the contract and the crop; it is always possible to track it through the supply chain. The supply chain and agriculture in general is fundamentally changing. We have already heard about how protein segregation has increased the number of separately managed crops in the Wheat Board system to more than 35. The system was not designed for more than the initial number of grades that were in place twenty years ago. In addition, 30-50 per cent of all production in North America is managed inside some form of identity preserved program. In other words, the crop is being tracked all the way through the system, from the field (actually from the seeding date) to the end user. Examples of this are Quaker Oats, Anheuser Bush and Warburtons here in Manitoba. Warburtons is an English bakery that is contracting through the Wheat Board and two Manitoba grain companies — Manitoba Pool and Pattersons — to achieve more or less direct contracting with the grower for varieties of Red Spring Wheat that yield specific protein contents. I will go into more detail about Warburtons’s use of GIS technology in a minute.

These trends are starting to put the focus on the end consumer. It is the end consumer that is driving the grain industry and creating the key supply chain challenges for the next five to ten years. The current grain handling system, as we know, was built on a single commodity for export — Canadian Red No.1 was the focal point of the system. However, this is no longer what end users want. There are no organizations set up to manage and respond to market driven requests for products that have other performance criteria. This issue is made more complex because these performance criteria are agronomical in nature and relate back to some basic farm practices which we do not necessarily understand very well. All of them are spatial in nature but until recently we did not have the technology with which to understand the spatial side. GIS technology provides one of the tools that is going to help us address these requirements.

A good example of what GIS technology this means for the supply chain is Warburtons. According to David Henderson, manager of their order fulfilment process (their supply chain), Warburtons wants to improve the profitability of their partners’ farming practice because he believes that if he can help his farmers it will be good for Warburtons in the long run. Their goal is to produce the best premium bread in the United Kingdom. They are the third biggest bakery in the U.K. and place a high premium on the quality of their products. I would like now to go through how Warburtons’s uses GIS technology to do so.

First, they use the technology to analyse farming practices and to see the impact it has on the final product. In other words, Warburtons wants to change their practices in ways that will both improve their economic bottom line and
their product quality. Second, they want to facilitate a call forward program. The term call forward is not meant in the sense of programming a phone to forward messages. For Warburtons call forward means that when they have a shipment they want to. When Warburtons fills a shipment (which they do on a monthly basis) they have to have some mechanism for bringing contract wheat that is sitting on the farm (not in the elevators) forward through the system. They want to call certain contracts forward from the producers. Ultimately they want the ability to better define what those shipments are.

Warburtons’ GIS system already has a number of the components in place. At the centre of it is a call forward module that sits atop the producer manager module which holds all of the basic information about crop history and the like. The agronomic analysts module is at the moment primarily a research tool that allows them to look at results and then ask “what if” questions based on location on the ground. The other module is the order filler.

Warburtons now has about 90,000 tonnes of grain under contract from what they think represents 300-400 producers. This is not a simple task they are trying to do, starting from a specific recipe and attempting to bring those exact grades forward from the individual producers to Pattersons or Manitoba Pool.

I have an active set of screen captures that show the process Warburtons goes through when they plan a shipment. The first screen shows the user a summary of shipments planned to date. The next screen is for data input, such as shipment date and target protein content. What this screen essentially does is allow tracking of the shipment as it is being made up. Components such as protein content are always being added, like a simple spreadsheet. The spread between the two elevator companies is the contracted split in terms of tonnage that has been allocated to each of them. You can also enter a target blend. In this example Warburtons has selected teal, saskqua and berry as the desired wheat mix. They can also specify which regions the various varieties are going to come from.

The GIS system runs an algorithm on the input variables and performs an initial allocation of the shipment by selected blend and region(s). It then begins to map out that allocation according to shipping points. Again, this data crunching always relates back to the contract. At this point, for example, the business rules of the contract define what regions are reporting to what shipping points. In our example here these are actually Manitoba Crop Insurance Regions. At this point the user is ready to “call forward.” The varieties available at each station — the varieties and the contracts available — have come up on the system and the user merely points and clicks, picking which contracts they want to pull forward. Warburtons makes up two orders, a primary order and an alternate in case some of the primary orders can not get there. This shipment call forward schedule is sent to the Pool and Pattersons who actually do the call forwarding to the farmers, and they get back to Warburtons with the final make up of the shipment.
What they are doing through this process is collecting and prioritizing contracts that will be called forward when demanded by the mill. In allocating contracts to multiple delivery partners and designating the product mix by variety and by region, Warburtons is selecting contracts and alternates in a way that ensures the orders are filled in case the first contract is insufficient. At the same time as the planning is being done the system tracks and monitors changes to shipment characteristics, such as changes in protein content, variety blend and location.

This whole system is fully integrated with product baking tests, allowing Warburtons a full view of their inventory database (what has been used and what is left to be called forward) at all times. In the future, as we start to see more drop off points, there will also be links to GIS-based car allocation and logistics optimization systems. GIS technology is already helping optimize routing in the Manitoba trucking industry; soon it will be able to do the same for rail car allocation.

Warburtons is a very simple example of the benefits of GIS. They are dealing with a relatively small geographic area. Still you can see that it is a very powerful tool. Most importantly, it is scalable. It is not dependant on size. Recall my initial idea of having a yield monitor on every machine, all reporting to a central database: at the conclusion of harvest you would have an updated database for analysis of the entire western Canadian inventory, by variety, grade, and location. However, this would require use of GIS technology on an industry-wide basis.

This means that the industry needs to take a serious look at a partnership arrangements and the like in order to get more widespread application of the technology. No one company covers the whole range so it has to be a cooperative effort. In particular, there needs to be broader access to an integrated agriculture database. By that I mean everything from soil information data to production yield data. The example that immediately comes to mind is crop insurance information. On July 15th of each year, crop insurance information tells us exactly what the seeded acreage is in western Canada and what varieties there are. After harvest, by November 15th, we know exactly what the yields are. However, the data is all proprietary at this point. If it could be shared in some sort of environment that protects the interest of the producer, it would be a much more powerful data base form the perspective of GIS technology. In other words, what the agriculture needs is partnership between all the various organisations — the Wheat Board, the grain companies, and the client organizations — because this is really a supply chain challenge affecting all stakeholders along the supply chain. The experience of Wal-Mart has proven that.

Fuller exploitation of GIS technology also requires greater integration with the existing Information Technology. For instance, there is a wealth of data already sitting in databases that these organizations hold. It has to be brought together and then “attached” to the point on the ground where GIS technology has its strength. I guess this is a very complicated way of saying that the technology holds a lot of promise but still faces some technical and institutional challenges. Thank you for your attention.
Questions/Comments

I think we all realize that the technological advancements are benefits, but there are a few pragmatic things that create some problems in the whole process. First, you talked about efficient farming being a key aspect of the database, but from a farmers point of view doing 90 soil tests per quarter section to get an accurate reflection of nutrient requirements costs $14.10/acre. At that price if I want to grow wheat for Warburtons I would simply over fertilize (add extra nitrogen) and let the climate take over. You can do all the computer modules and yields data that you want but the bottom line is that if it rains once too often you are not going to get into Warburtons. So, I think there are some fundamental economic things that happen at that particular spot in the dirt that have little to do with global positioning or information and more to do with the weather and economics.

Secondly, you mentioned the value of a large accessible industry database, but I would argue that too much data reduces volatility in the market and that is not good. Farmers need volatility to see pricing signals; reducing volatility in the market eliminates the pricing signal. We see this problem with the Wheat Board grain market where there is zero volatility because there is only one buyer. If you reduce volatility further by adding more information the same thing will happen to non-Board grains and that is negative.

Response, Bruce Graham

With respect to precision farming, I was not trying to suggest that precision farming is a required input to this process. It has lots of problems, as the gentleman has pointed, particularly in its implementation. I personally do not believe that precision farming is there at the moment and will not be for a number of years for a lot of those reasons. First, we do not understand the agronomics at the level required to make it economically worthwhile to go out and take those soil tests. Second, we do not know how to define those zones in the fields so that we are able to fully reap the benefits of the technology.

What I think is possible and valuable is knowing exactly where everything on the ground was. If you had a yield surface you would know what your inventory was at any point in time and you would know something about the characteristics of the surface if you had sampled it. In terms of volatility in the market place I am not suggesting how you use the data. What I am saying is that we have a very powerful tool in being able to go after markets that are demanding specific input. A significant proportion of the market, at least in the US, is moving that way whether for good or for worse. Basically GIS technology can help sort through some of supply chain problems supports some of those end users requirements.
Dr. Barry Prentice, Director
Transport Institute, University of Manitoba
Transportation of Pulse and Special Crops

Introduction

Information on the transportation of pulse/special crops is very limited. Aside from aggregate export data, published information is unavailable on the method of transport used to move these crops from origin to destination. Primary data collection was undertaken by the Transport Institute to ascertain the volumes and methods of moving products to export position for the 1996 crop year.

A survey of 33 pulse/special crop exporters was developed with the assistance of the Canadian Special Crops Association, Saskatchewan Pulse Growers, Pulse Canada and other industry associations. A telephone interview and faxed questionnaire were extended to each company. In total, 20 companies cooperated fully. Most of the 13 companies that refused to cooperate are minor players. Based on comparison with 1996 crop year export figures, the survey captured approximately 81 percent of all movements.
Prairie Outflow by Equipment Type and Port Destination

Exporters were asked to indicate the method of shipment and the port of clearance for edible and feed crops. The survey data are presented for the combined Prairies in Table 1. The aggregate volumes of Western Canadian pulse/special crops exports are displayed by mode of inland transport and port of exit. Edible crop exports are presented in the top half of the tables, and feed exports are arranged in the bottom half. Only three western ports, Vancouver, Prince Rupert and the U.S. Pacific Northwest (PNW), and three eastern ports, Montreal, Thunder Bay and Halifax, were recorded as having export clearances.

The eastern and western ports are almost balanced in aggregate. The eastern ports account for slightly more exports of edible crops, while the western ports have a greater share of feed exports.

Inland transport of pulse/special crops varies significantly by commodity and shipping method. Feed crops are moved almost exclusively in bulk and hopper cars account for roughly 80 percent of feed shipments. Edible crops rely more on boxcars and domestic intermodal (containers and trailers on flatcars). About two thirds of edible crops are shipped in sacks or bags. Boxcars are most important for packaged product movements to the western ports, while domestic intermodal is more important for eastern shipments. Hopper cars are important for export of certain edible crops, such as yellow peas, which are moved in bulk.

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1In the case of containers, the final port of discharge could be on the U.S. northeast. Western-based exporters did not list this port, but other participants indicated that some movements flow through the U.S. ports.
Table 1: Prairie Exports: Mode of Inland Transport and Port of Exit, 1996 (tonnes)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Western Ports</th>
<th>Eastern Ports</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VANCOUVER</td>
<td>PRINCE RUPERT</td>
<td>U.S. PNW</td>
</tr>
<tr>
<td><strong>INTERMODAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marine Container</td>
<td>8,454</td>
<td>0</td>
<td>44</td>
</tr>
<tr>
<td>Tractor-Trailer</td>
<td>2,098</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>Boxcar</td>
<td>92,303</td>
<td>5,724</td>
<td>748</td>
</tr>
<tr>
<td>Hopper Car</td>
<td>84,792</td>
<td>11,727</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL EDIBLE</strong></td>
<td>194,762</td>
<td>17,451</td>
<td>811</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mode</th>
<th>Western Ports</th>
<th>Eastern Ports</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FEED</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marine Container</td>
<td>362</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tractor-Trailer</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Boxcar</td>
<td>49,996</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hopper Car</td>
<td>407,763</td>
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<td>0</td>
</tr>
<tr>
<td><strong>TOTAL FEED</strong></td>
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<td>0</td>
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<tr>
<td><strong>GRAND TOTALS</strong></td>
<td>652,883</td>
<td>17,451</td>
<td>811</td>
</tr>
</tbody>
</table>

Marine containers account for a relatively small proportion of inland movements. The majority of edible crop exports are transloaded to marine containers at the ports. Marine containers source-loaded (MSL) on the Prairies represent less than ten percent of total inland transport of edible crops. Movements of source-loaded marine containers to eastern ports are four times greater than to western ports.
Truck movements of pulse/special crops are generally limited to edible crops. The eastbound volumes are more than double those shipped to western ports. Although the distance to the western ports is shorter, these shippers face “front haul” rates, and the carriers have difficulty finding return loads from the western ports. In contrast, the shipments to eastern ports enjoy lower “backhaul” freight rates. Truck movements are a minor component of the total, but illustrate the efforts of the industry to find every available means of transporting these products to port positions.

Freight rate and service options vary with location and availability of equipment. Incentives to export through alternative ports are reflected in the commodity flow patterns of each province. Montreal dominates eastern port exports of edible pulse/special crops, while Thunder Bay accounts for an equal volume of feed exports. Domestic intermodal, which includes trailer-on-flatcar (“piggy-back”), is the dominant method of moving edible crops. The disproportionate share of Montreal reflects favourable freight rates granted to reposition this equipment.

The domestic market and exports to the United States must be added to the port data to complete the picture of Western Canada’s pulse/special crops industry. Figure 1 illustrates the flows of edible pulse/special crops from the Prairie provinces to destinations. Overseas markets receive approximately 80 percent of shipments (484,000 tonnes) with the other 20 percent consumed in North America. Total domestic shipments are 59,396 tonnes, while exports to the U.S. are 132,000 tonnes. Saskatchewan shipments are four times the volume of Alberta and Manitoba combined. (twelve times Alberta’s, and seven times Manitoba’s respectively) and are evenly balanced east and west.

Figure 2 presents the shipments of feed pulse/special crops from Western Canada. Overseas markets consume a greater proportion of pulse/special crop feed than edible exports. Feed shipments to North American markets account for less than 4 percent of total production. This can be explained by the abundance of feed supplies in the U.S. and Canada, but may change as the hog industry of Western Canada expands. Feed peas are now being used to replace part of the imported soybean meal in hog rations on the Prairies.
Seasonality of Marketing Patterns

Figure 3 shows Canadian pulse/special crop export volumes from July 1992 to July 1997. Over the past five years pulse and special crop exports have risen steadily with increasing production. The reason for the decline in the past eight months has not been established, but it coincides with the shipping problems experienced during the severe winter of 1997.

A seasonality peak occurs between October and January each year. Several reasons can be advanced to explain the peak: 1) farmers want cash immediately after harvest to pay their bills; 2) European demand for soups and stews increases in the winter months; 3) a premium is available to the fresher product; 4) processors use this period to pack products; and 5) this season coincides with the Arab world celebration of Ramadan. A second, less pronounced, peak occurs from mid to late spring (May to June), with the opening of navigation on the Seaway. The annual seasonality based on the average of the past five years is presented in Figure 4. The largest single month for pulse and special crop exports is November with 14.5 percent of total shipments over a five year average. December and January account for 10 and 11 percent of shipments. For edible and feed markets combined, nearly 45 percent of annual production is exported during the period from October to January.
Seasonality and product requirements influence the demand for transportation equipment. Figure 5 shows the demand for equipment by type during the 1996/97 crop year for edible shipments. Demand for boxcars, hopper cars, and intermodal equipment capacity is evenly distributed during the peak period, October to January. Marine source-load and tractor-trailer shipments account for lesser proportions of shipments, but remain a vital element in the movement of pulse/special crops. Figure 6 shows the demand for equipment for feed exports. Hopper cars are overwhelmingly the choice, with approximately 90 percent of shipments by this mode. Boxcar, intermodal, and tractor-trailer account for the remaining 10 percent. At present, intermodal containers account for a minor share on inland transportation, but this is likely to change. In 1997 the railway movement of containers in Canada increased by 11 percent. The Canadian railways are making significant investments in locomotives and terminals to keep up. The opening of Delta Port in the summer of 1997 and the introduction of the post Panamax generation of 6,500 TEU containerships promise to expand the availability and lower the costs of marine containers.
Conclusions

The exporters survey data show that exporters use a greater variety of equipment to move edible as opposed to feed crops. The largest share of edible crops is packaged on the prairies and shipped on pallets to the ports where they are stuffed into marine containers. Feed exports are moved predominately in bulk using hopper cars.

The pulse/special crop survey data illustrate an important principle of logistics: A mixed system generally performs better than a pure system. It can be observed that two separate markets exist whose peak shipping periods generally coincide. The greater seasonal demand for equipment in the four months immediately following harvest stretches the ability of the system to perform. By using a variety of transportation modes, pulse/special crops exporters increase the likelihood of reliable service.

Reaction Panel

Robert Tisdale, Manager of Special Crops
XCAN Grain Pool Ltd.

The information that Barry just gave you is extremely important to traders like myself. In particular, Barry’s presentation indicated the historical trends that we pay very close attention to. What’s happened in the pulse/special crops market over the last few years is really quite interesting, as more growers have looked to pulses and special crops for opportunity. For example, I was in the seed business, but I saw incredible opportunities opening up in the pulse/special crops area. However, these changes in market structure occur before the necessary changes to transportation infrastructure. For instance, we have feed pea production upwards of 1.7 million tonnes moving in a fairly unrestricted trade atmosphere but are restricted by a domestic transportation system that was designed for different purposes. So now we have to figure out the fairest way to change it so we can best serve the grower and the companies we work for.

We are witnessing a huge transition in transportation, from the Wheat Board administrative environment to a much more open environment. This transition involves many different companies and associations who are motivated by new market opportunities. While history and trends are valuable, what we on the trade side try to concentrate on is what is happening right now, in order to answer our customers questions (i.e. is the market going up or down). By customers, I mean off-shore customers. The farmer clients also are concerned with recent trends so that they can relate plan seeding plans to production and consumption patterns in the export markets. From production and consumption trends we can forecast future seeding commitments.

I thought I could give some insight on where pulses are likely going in the future. For feed peas the trend is already well established, with new markets opening up, particularly China where they prefer the yellow pea but they will
take green peas. I was speaking to David Nuzik before the conference and he said some 130,000 tonnes of peas have moved through Vancouver so far this fall. These volumes reflect activity in the new markets (for example, the Indian market is now second to the Chinese market). The reason is prices, but there are other factors are coming to bear. What is important to the Chinese buyer, for instance, is not necessarily important to others. For example, the Chinese do not like split peas because they the milling process.

Another new factor affecting markets is handling technology. Pacific Elevators, an affiliated company, has implemented a new belt system dedicated to agricultural products. This kind of thing is important because on direct hits the pulse/special crops industry has to compete with potash, which it cannot (i.e. our six thousand or ten thousand tonne vessel has to defer to their forty or fifty tonne vessel). This costs us money in terms of demurrage and lost time.

The main thing that people involved in transportation can do to assist the future needs of the pulse/special crops industry is to listen and communicate more effectively. I think this is the biggest challenge we face as traders; we need to be the best listeners we can possibly be, often across different cultures. So, if I have to leave you with one message, it would be to become very good listeners to what people like Barry are saying, to what our clients are saying, to what traders are saying and to what our rail system is saying. Thank you.

**Reaction Panel**

*David Smith, Branch Manager*

*Panalpina*

I would like to talk about the emergence of the special crops business in the early 1970s when I arrived in Winnipeg and how it has grown over the past number of years. Back in the early 1970s the special crops business was small, with exports of maybe 100-200 containers per year, mostly to European markets and some to southern Mediterranean markets. This was before the Fall of Communism, so the Soviets were not supplying any of the European markets at that time. Over the past ten or fifteen years this business has grown substantially, peaking in 1994-95 when we moved close to 11,000 containers. However, 1994-95 was an abnormality, a result of poor weather conditions and poor crops on a world wide basis. We are now back to normal levels of 7,000-8,000 containers per year.

In the past few years the markets have shifted. A lot of the former iron curtain countries are starting to supply much of Europe so traders such as Rob Tisdale have had to find other markets. So we now see a lot of traffic going into South America. Of the past few years this has increased dramatically, and from what I understand of the Special Crops Association this trend will continue.
Over the years we have also seen diversification of special crops and pulses. Initially it was mainly peas and to a lesser degree lentils, but over the past few years we have started to see small shipments of what are called crop identifiable products moving out of the US Midwest and Prairie regions. Some of these are wheat and flax (just recently we moved some containers of wheat from Nebraska to a large milling company in England for a test bake of a particular type of bread). If this wheat is of acceptable quality we can expect larger shipments in the future (maybe five to ten containers at a time on a regular basis). In general we are seeing increasingly smaller shipments of wheat rather than the shipload quantities of the past. With the organic market growing, milling companies are looking for organic wheat which they can only get way to get from the Prairies or the US Midwest.

The spectacular growth of the pulse/special crops industry has created new problems in the supply and demand of marine containers. As many of you know, many of Canada’s raw material exports — from wood pulp to nickel to pulse crops — move in 20 foot containers. Meanwhile, Canada is a large importer of consumer goods (e.g., radios, garments, televisions, etc) which come into Canada predominantly in 40 foot containers. So, we have a tremendous imbalance in the container market and container availability remains an ongoing problem.

We are not only short of containers but also the equipment to handle and transport them. This problem stems from the early 1970s, when ocean vessels had capacities of between 800 and 1500 TEUs (twenty foot equivalent units). Over the years the size of these vessels has grown tremendously; they can now carry 6,500 TEUs and will soon carry 8,000 and upwards. Ports such as Los Angeles and other west coast North American ports are now receiving as many as two or three of these large vessels per week. This puts enormous pressure on the railway system in these areas to move these volumes inland. In some cases it can take over two weeks just to get the cargo off the dock and move it across to the US east coast. The Americans are very nationalistic and tend to keep these particular railcars in their system rather than allow them back into the Canadian rail system. This puts great demands on the Canadian system. For example, we have been waiting for two weeks to reposition empty containers into Saskatchewan. Of course, shippers who cannot get containers inland have to ship their cargo to Montreal for stuffing, putting pressure on the trucking industry and the railways alike to supply equipment which is already in short supply. This problem is compounded over the winter until the spring when it seems to return to normal again.

Another contributing factor to the increase in port activity is the increase in the number of shipping lines operating. In the north Atlantic right now there are probably ten to twelve different steamship lines. We have an over abundance of vessels in the marketplace. While this is good for shippers as they gain from lower freight rates, the increased volumes means the cycle repeats itself with capacity problems and poor equipment utilization.
Ocean rates seem to go in five year cycles — after an initial drop in rates their is a gradual increase over the next five years before they fall again. They are at an all time low right now and more and more people are taking advantage of it. Recently I heard of a rate out of the Port of Vancouver into Korea on a 40 foot containers at around $800 (US) and that included the dock charge at Vancouver. As most of you know, you cannot move a shipment of lentils from Winnipeg to Vancouver for that price. When ocean rates are as low as they are now, or as they were ten years ago, it tends to shift freight away from bulk shipments toward containers.\(^2\)

The decrease in rates has a major impact on the amounts of cargo that moves out of the Prairie provinces to oversees markets. One of the major problems is that everything seems to move at once and, as Barry pointed out, this seems to peak in October. Last year (1996) was particularly bad. At the beginning of the season we had clients booking 50 to 60 containers at a time, resulting in 200-300 containers all going on one vessel. Consequently, suppliers had to move a lot of their cargo by rail within a tight time frame to Montreal for loading. Most of the cargo arrived late in Montreal and missed the first ship; the cargo had to be “short-shipped” to the following ship. We ended up with a huge amount of cargo sitting in Montreal waiting for space on vessels. And yet this was all because of lack of equipment on the Prairies and the lack of foresight of buyers.

Ideally, what these buyers should do is divide their shipments over a number of months and bring them into the system earlier (or later) than they normally would. However, that is not likely. Many people blame the forwarder or the steamship line for these problems, but most of the blame lies with the inland portion and the fact that it is impossible to get the freight to port in time to meet the particular vessels.

A new trend among some steamship lines is around the world service which, once all the big players — the big Japanese and Far East carriers — become involved, will help our situation tremendously. With around the world service the steamship lines have consistent use of containers. This will keep them at capacity and therefore profitable.

Another trend, of course, is that the vessels are getting bigger. You can imagine what this will do to freight rates. The problem is that some ports are unable to handle these larger vessels. As a result, the Port of Vancouver recently opened Delta Port, which has large gantry cranes capable of extending 100 feet out over the water to accommodate these larger vessels. The Port of Montreal has done the same thing, but is still limited by the depth of

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\(^2\) Ten years ago the rates on the Atlantic were at an all time low of around $600 Cdn for a container. At that time we saw a sudden influx of shipments of canary seed, which usually goes in bulk on conventional vessels, switching to containers. In the last six months we have seen a similar situation develop on the west coast.
the river. Vessels are also becoming wider. In the years to come we could see a 20,000 TEU vessel that carries a 1,000 TEU capacity ship for ferrying containers to and from the containership to the port.

Questions/Comments

Q: Dave what would you say is the ultimate limit for these ships in terms of TEU size, 10,000, 8,000?

Dave Smith: I think Delta Port can handle a 8,500 TEU ship, but I can see them getting bigger yet.

Q: For smaller ports, do you foresee a day when an offshore floating container platform, like the configuration at Delta Port, with a rail line to shore?

Dave Smith: There are some ports that have lighter barges where the vessel sits just outside the port and barges take the cargo to port. In fact, I know of one ship that sailed out of Japan fully loaded for Hong Kong but could not get into Hong Kong because it was taking too much draft and they had to bring barges out to offload the ship.

Rob Tisdale: I neglected to comment on a point made by Dr. Prentice on the use of differential freight rates to decrease the freight rates and perhaps extend the shipping period to offer some discounts to buyers. Dave also alluded to the Algerian situation in which it would make sense to spread shipments out. I thought that was a good example of how the world complicates these good ideas. Algeria is a Muslim country which celebrates Ramadan. But the date of Ramadan moves forward each year by about ten days or so. Therefore, it keeps moving closer to our harvest period; eventually it will fall right during our harvest. Ramadan is a six week festival period during which there is little in the way of work being done during daylight hours; business is occurring after sunset. Therefore, the buyer wants his lentils in the country prior to the start of Ramadan so that they can distribute them for the rest of the winter period. Come spring, depending on what remains, they will buy a bit more, but generally they will start looking to next year’s shipment in August instead of September. This kind of thing, a cultural thing, affects our ability to supply in ways that are unforeseen.

Luncheon Chair

Doug Campbell, President

Campbell & Associates, C & A Business Strategists Inc.

We have two or three speakers to squeeze in before we reconvene at one o’clock. Barry Prentice made reference earlier in the day to the Kent Healy Memorial lecture and those of you who were looking in this direction might have noticed the poster on the wall which tells some of the history behind it. To provide some of this background and to introduce the Kent Healy Lecture we have with us Mr. Howie Teschler from Detroit, Vice-President of FCM Rail. Mr Teschler also spent twenty years with Canadian National in the US grand trunk. I should also note that he was involved in the bidding on the Bay Line to Churchill, which shows that there is competition among the short lines. Please welcome Mr. Howie Teschler.
Howie Teschler, Vice-President  
FCM Rail

Thank you Doug. Ladies and gentlemen it is a pleasure and honor to be here with you today in Winnipeg. I want to take a few minutes to talk about Kent Healy.

Kent Healy was my professor when I was at Yale in the transportation economics and railroad operations program. He made a profound impact on railway transportation during his 42 years at Yale. He was among the first to approach transportation problems from an interdisciplinary perspective, combining the tools of engineering with modern microeconomic and location theory. Professor Healy, among other things, was a director of the New Haven Railroad, author of several books on transportation and an excellent teacher and mentor. My class mate Ed Burkhart is a good example of the type of student that came out of Kent Healy’s program. Ed, as you may know, is the CEO of Wisconsin Central, English Welsh and Scottish Railways, the principal carrier in the UK, and Transrail in New Zealand. He also recently bought into the Tanzanian Railway in Australia. Our guest speaker today, Kent Shoemaker, is another excellent example of Kent Healy’s legacy.

The objective of the Kent Healy Memorial Lecture is to encourage young persons to choose transportation careers, particularly in railroad management, engineering and operations. To that end the Yale alumni set up a fund upon Professor Healy’s death in 1985; today you are participating in the legacy of that fund. I would like to close by saying that Professor Healy always showed tremendous interest in his young students and made a lasting contribution to their lives. Thank you for attending this lecture and I wish you all well.

Doug Campbell  
Luncheon Chair

Our next speaker is Kent Shoemaker. Kent is the chairman and CEO of the Red River Valley and Western Rail Road and the Twin Cities and Western Rail Road in Minnesota. Kent graduated from the University of Michigan with a B.Sc in industrial engineering in 1957, and subsequently joined the Baltimore and Ohio (B&O) Railway and advanced through various engineering, transportation, and strategic planning positions with the B&O and the CSX system (as we know it today). He moved to Minneapolis in 1965 to join the Soo Line where he held several planning and line positions, eventually advancing to the position of Assistant Vice-President of operations. He subsequently served as president and CEO of the DTI Railway (Detroit, Toledo and Ironton) in Detroit, and the Delaware and Hudson (D&H). For those of you not familiar with the D&H, it is the most efficient link between Montreal and Philadelphia. It was very actively pursued by both CN and CP for takeover; in the end CP took possession in the early 1980s. Kent then formed Red River Valley & Western Railroad (RRVW) in 1987 and the
Twin Cities & Western Railroad (TCW) in 1991. He has also served as a transport consultant, deeply involved in the start-up of many short line railways. Please welcome Kent Shoemaker.

Kent Shoemaker, CEO
Red River Valley & Western Rail Road
Kent T. Healy Memorial Lecture

It is a pleasure to be with you today. As you might gather from Howie Teschler's comments, delivering a commentary worthy of Kent Healy is an imposing task. There are few academic programs around that have stood the test of time like the Strathcona Fellowship Program which Kent administered at Yale for over forty years. The program was named to honor Donald Alexander Smith, an incorporator in the Canadian Pacific Railroad, who was honored by Queen Victoria with the title of first baron of Strathcona and Mount Royal. Lord Strathcona, as he became known, supported Yale University's transportation course. In fact, he is depicted in the mural on the wall here, driving the last spike.

The graduates of Kent Healy’s program, as Howie Teschler mentioned, are well known and have dominated the "who’s who" of railroading for many years. They include at least seven railroad presidents. The continuing respect shown to Kent Healy’s work in both the academic community and from his former students is remarkable. Although Kent passed away in 1985, his former students, most of them retired, still regularly meet to raise funds to find opportunities for college students.

I met Kent Healy when I was very young, through my father, who was his first student at Yale in 1928. Several years later my father arrived in New Haven, Connecticut to join the New Haven Railroad, but our furniture did not. It was Kent Healy who came to the rescue, providing food, a mattress, a bassinet and pillows. In case you have not guessed I was named after Kent Healy. So, as you can see, when Barry Prentice asked me to present the Kent Healy Memorial Lecture I had no choice but to accept. Today I am going to talk about transportation deregulation from a US perspective, the return of growth to the railroad industry, the spawning of new regionals and short line railroads and future challenges. I will try to direct my comments toward agriculture given my audience.

The railroad industry, like other industries, has been subject to a startling amount of change over the last two decades. Today this change is accelerating. Railroading and agricultural interests have long been and continue to be deeply intertwined, although the relationship has not always been rosy in both the US and Canada. Many of the problems date back to the abuses of the Robert Barron days of the early 1900s which caused governments in North America to intervene into the transportation industry, where it stayed until the 1980s. Over time competition from other modes, particularly motor carriers, grew dramatically. However, neither US nor Canadian governments
recognized the public benefit that could be gained from pricing freedom. In addition, the losses from subsidizing passenger rail transportation increased with the growth of the airline industry and increasing use of the private automobile. As a result, by the beginning of the 1970s railway bankruptcies began to occur. Although the 1971 legislation which created Amtrak helped mitigate passenger losses, further erosion of profitable merchandise traffic continued, resulting in many railway bankruptcies throughout the 1970s. At the time, many people thought that the end of private railroad structure in North America was imminent.

The rebirth of the railroad industry in the 1980s and 1990s has its origins in the massive consumerism movement of the 1960s which pressured for relaxation of government regulation of the transportation industry in the United States. The airlines were the first to be affected followed by the motor carriers and finally the railroad industry. The deregulation movement is still alive and well as witnessed by the telecommunications industry and the electric utility industry. During the 1970s motor carrier rates remained nearly constant as the industry struggled with increased pricing freedom. During this period many large national trucking companies failed. Meanwhile, the railroads lost much of their more profitable merchandise traffic as they raised rates in the face of a 30 percent increase in their expenses. This was the low point for the railroad industry. Finally, in October 1980 the Staggers Act was passed. It has been described as the most complex piece of legislation ever passed through the US congress. It not only provided the basis for pricing freedom but also a process that gave Class I rail carriers the means to reduce branch line losses. By 1985 the Interstate Commerce Commission had issued exemption proceedings permitting newly formed companies to acquire branch lines from Class I carriers through an abbreviated regulatory process. Also, the new short line operators were exempt from historical work rules and therefore not bound by commitments to long-term job protection. All of these changes provided the basis for railroads to stem their losses. Over time they learned to live in a competitive deregulated environment. The process was not easy, however, as deregulation eliminated the protection offered by regulated pricing. Eventually the railroad industry became a growth industry again after almost sixty years of shrinking market shares.

Today the railroad industry is healthier than it has been in fifty years, in large part because of the growth of intermodal transportation as railroads, barge companies and motor carriers blend there operations. In recent years railway intermodal growth has received a strong boost from the escalating expenses of long distance trucking. The formation of short lines and regionals in the US has been an amazing success, but it would not have happened if legislation had not provided for the large railroads to shed light density lines. Before talking about short lines, I am going to tell you a little about a Soo Line marketing effort I was involved with which changed my perspective on railroad marketing opportunities.

In the early 1970s Soo and other carriers of wheat, durum and barley from North Dakota to the Twin Cities (i.e. the Port of Duluth and Port of Superior) found themselves in a difficult competitive situation as trucks had taken more
than 50 percent of their traditional traffic. Even with lost business, carrier shortages existed at times. Railroad costs were substantially lower than motor carrier costs so obviously railroad rates were too high. The marketing personnel at Soo were worried that a substantial rate reduction would simply dilute revenues as their would be inadequate car supply to regain much traffic. At the time, I was a relatively young manager and had only recently been placed in charge of transportation operations. The transportation and grain marketing personnel were directed by the president to work together to develop a marketing strategy that would recover lost grain business and deal effectively with the car shortage issue.

At the time, unit train structure did not exist in the country, so our planning effort resulted in the creation of a totally new set of rules governing loading and destination, free time and other provisions that limited decisions and required naming the destination elevator at the time of billing. These conditions had to be met before shippers were eligible for new rates. The rates could be applied to single car shipments and included a 20 percent rate reduction. The rules provided each shipper with a ten hour daylight period in which to load and bill a shipment. We arranged transportation service so that the cars placed at branch lines stations would be placed and pulled with the same crew, at most 24 hours after spotting. Traditional handling was such that grain cars averaged more than five days at load point because the branch lines were not served daily and billing was not rendered until the crew that placed the empties was long gone from the line. With the new rate structure cars averaged only eighteen hours at the load point. The rule requiring that the destination elevator be named at the time of billing resulted in much improved transit times. Soo improved its car turn around cycle from twenty-two days to less than twelve -- a remarkable improvement -- thus enabling the railroad to efficiently handle the increased traffic. The Soo's market share returned to 80 percent in less than a year while the agricultural community enjoyed the benefits of a 20 percent rate reduction.

I learned some valuable lessons from my experience at Soo. First, a vast improvement in car utilization can be achieved by closely tailoring tariff requirements with specific service design. We achieved this without making additional investments. Second, transportation personnel should have input into the design of tariff structure and be committed to produce the necessary service. Third, improved service reduces operating expenses. And fourth, major improvements can be achieved if transportation managers are motivated to turn wasted car days into revenue (as you may know, most operating managers of large railroads are measured on expense control and thus are budget driven; they have no responsibility for revenue). The final lesson I learned is that marketing execution should be everyone's responsibility.

Most of you are no doubt aware of the large increase in the number of short line operations in the US, as more than 240 new companies have started in the past ten years alone. What you may not know is that short lines and regionals have a wonderful record of growing business volume. Indeed, growth rates of 50 to 100 percent in only a
few years are quite common. From those numbers you can see why the large carriers have continued to spin-off lines. In most cases these are lines that were losing operations, were faced with continued traffic erosion and often had serious deferred maintenance problems.

As I mentioned these impressive growth rates in the railroad industry are due almost entirely to intermodal growth and increased business from short line connections. Why have they been so successful? In a nutshell because local managers were empowered to make decisions and produce the actions necessary to satisfy customer need immediately. Most short lines have multiple task-trained personnel where just about everybody, including train crew members, have a customer focus. In fact, short lines often act as advocates for their customers in dealing with the large railroads, especially in trying to get answers addressed promptly. This includes not only rates but also service problems and freight car equipment supply. Because decision making in most large railroads is difficult and bureaucratic, most small customers and often even large important customers do not get adequate attention.

The Red River Valley & Western Railroad (RRVW) just celebrated its tenth anniversary and in 1996 received the Regional Railroad of the Year Award. The RRVW is a spin-off from Burlington Northern (BN), with which it remains a close partner, and is comprised of some 860 miles of line, operating mostly in North Dakota serving wheat, durum, barley and sunflower producing areas. We also originate corn and soybeans on our lines near the South Dakota border. In total, the RRVW serves 70 grain elevators, a large sugar beet plant, a new corn fructose plant, and the Melroe Company (producer of Bobcats and the largest manufacturer in North Dakota). Before the arrival of the RRVW not a single car load was handled by rail to Melroe for many, many years. They are now one of our largest customers. Our overall business has grown from 19,000 car loads to over 30,000 in 1997 and we expect to exceed 35,000 car loads in five years.

My experience with grain marketing in the 1970s had a very significant impact on our thinking at RRVW. From the beginning we made the rapid turnover of freight equipment a priority and we have continually worked hard to turn freight cars faster at our stations than the Class I carriers can at their own stations. Moreover, our demurrage rules for single car, multiple car, and unit train shipments are all more restrictive than those of our Class I connections. Our objective is to ensure that our Burlington Northern Santa Fe (BNSF) partner is not disadvantaged by giving Red River empty car days (cars during car shortages). We do our best to move shipments in less than one day after placing the empty equipment, often with the same crew that placed the car. I have never had a complaint from a customer that our loading rules were unreasonable.

We also concentrate our efforts on employee development programs and try and keep all employees well-informed of our problems and progress. We believe we pay our employees well, at the high end of local wage rates, although admittedly they are not as high as Class I wages. We also have a profit sharing plan. The payout over the past three
years has exceeded twenty percent of the payroll earnings each year. Our managers and our hourly employees receive the same fringe benefits which, incidently, includes long-term disability for on-job or off-job injury. Our employees are multi-task trained and it has never been necessary to lay people off, despite the seasonality of our operations and the volatility of the grain market. During spring planting and road restrictions we routinely use train crews members to assist with track work. We empower our managers on the ground to make decisions concerning daily operations and car supply.

The Twin Cities & Western Railroad (TCW) operates from St. Paul, Minnesota and serves customers to the South Dakota border. It was a Canadian Pacific main line spin-off and commenced operations in 1991. The TCW is similar to the RRVW in that it also serves a large sugar beet plant and many (19) country grain elevators, handling mostly corn and soybeans. The TCW’s personnel policy and pay structure are also similar, but there the similarity ends.

TCW’s line has grown considerably since 1991 and we expect about 16,000 carloads in 1997. One major difference between TCW and RRVW is that TCW is a rate measurer and works progressively with all Twin City connections. TCW also assumes responsibility for supplying cars to rural customers. Another major difference is that TCW handles large volumes of corn and soybeans to barges on the Mississippi River. The whole operation is local in that TCW handles the complete movement with its own crews. This goes against conventional wisdom which says that railroads — even short lines — are not able to profitably handle short haul grain. During car shortages TCW handles its grain cars, turns its grain cars three times per week for most of our elevators to the Mississippi. The barge load is about 1500 hopper cars (today a barge shipment is not loaded unless a barge is available to unload the shipment next day). Our excellent equipment utilization allows us to use about one quarter of the cars that were used before we began operations. From our experience at TCW we are convinced that railroads can compete effectively for short hauls, particularly with corn and soybeans, provided a high level of equipment utilization is achieved.

Red River Valley & Western is also in the short haul business. It handles a small unit train of gravel during the summer and corn to a new large corn fructose plant located in Wapaton. In fact, that corn plant was located there because of the whole value added movement in the processing industry. Everybody told us that we would not get that short haul traffic to the plant and that we would have to make up revenue on back hauling fructose shipments out of the plant. Well we have done both so far. I think the reason for our success is that if corn comes from an elevator, that is, if it is moved off the farm into the elevator, we invariably end up handling it because of our quick turn around rates. Turning equipment every day or every two days permits a rate structure that no motor carrier can compete with, even in short haul. Obviously if the farmer sells directly to the corn processor he has one truck delivery and we do not see much of that traffic.
The challenge of improving productivity is no less of a concern for a short line than it is with any other business enterprise, as there is continual competitive pressure. As you may know, the nature of railroad operations is such that most costs are fixed costs (we say in the business that only fuel and freight car ownership costs are variable). As a result, most train crew assignments can handle additional traffic with relatively little additional cost. Accordingly, incremental business growth is often very profitable. In the railroad business one’s productivity can look deceptively good with growing volume. The more difficult challenge is to reduce fixed or largely fixed expenses while at the same time providing quality services.

I thought you would enjoy a brief video of the Red River Valley & Western operations in North Dakota, and some Twin Cities & Western operations in Minnesota. The first part of the video concerns the never ending battle with snow drifts on the RRVW line. These scenes were taken in 1993/1994, which was good practice for the 1996/1997 winter season when records were broken. In the second half of the video you are going to see what looks like a very ordinary train carrying grain cars arriving at a bridge. This operation is in North Dakota on RRVW line which never had the hillsides graded off when it was originally built. As a result, there are some cuts that invariably fill up with 15 to 20 feet of snow. Every year we have this problem on these sections, but last year we had drifting of this kind everywhere. Needless to say, since these pictures were taken we have purchased some snow blowing machines. These machines operated almost twenty four hours a day for weeks at a time — we had to run them ahead of trains and behind trains because this kind of equipment was made more for the Rocky Mountains than for the Prairies. They only go about three mph, for example. It takes one locomotive unit and all electrical power it will generate just to drive the turbines and equipment on the plow; the second unit is there to drive everything else.

What you are looking at in this next footage is TCW operations on the outskirts of Minneapolis. While this may look like a conventional operation, if you pay particular attention to unit 303 you will notice that it has no diesel engine in it. This so-called “slug” engine runs off the adjacent locomotive unit to take advantage of the fact that locomotives are idling 40 percent of the time. In other words the “slug” is using the power generated by the adjacent locomotive and we can run eight traction motors off of it. Using a “slug” cuts down on locomotive maintenance. I should tell you that these are Caterpillar locomotives which were originally thought to challenge GE and General Motors in the locomotive business but the horse power race got ahead of them.

Before I close, let me make a few comments about some future challenges that we have ahead of us. Today 20% of shipments in the US originate or terminate on a short line. That tells you how far that movement has gone. Accordingly, short lines and the large Class I carriers are interdependent partners, whether they like it or not. In my opinion the organizational structures of the large railroads has to be addressed so that they can be more responsible to customer demands. Most large railroads are out of touch with their customers, particularly smaller customers. The merger movement has made the problem worse because few local managers have the freedom to make
decisions. The large railroads all have centralized structures that, although helpful for dispatching trains and locomotives, makes decision making very difficult, particularly if there are multiple departments and issues involved. If they were to operate as semi-autonomous units where operating decisions could be made more promptly, they could achieve better customer service.

The next big challenge is to provide safer operations because the public will simply not tolerate train accidents involving loss of life and hazardous material accidents. Safety is a concern that is going to impact all levels of activity in our business and it is going to be very expensive.

The deployment of high capacity cars is also going to be very important for the survival of many branch lines, perhaps even some short lines. Many branch lines are incapable of handling 286,000 lb. axle loadings, much less the 315,000 lb. capacity cars that are now under active test. If grain rates are set to favor the use of such cars on main lines the impact will be felt throughout the agricultural community and branch line towns in particular.

Thank you very much for your thoughtful attention today. I close with the knowledge that Professor Healy would have loved to participate in such a weighty discussion. One thing that has not changed since Kent’s day is leadership which is the key to all new direction and finding answers to our transportation challenges. We need a continuing influx of the kind of leaders that Kent Healy nurtured. Thank you.

**Doug Campbell**

*Luncheon Chair*

Sir you may not realize this but you have touched on every nerve in the Canadian grain handling and transportation system and I am sure there is a long list of clients lining up to purchase that video from you — CN, CP, the Canadian Transport Agency and the Canadian Wheat Board should all be interested. I would like to call on Dr. Barry Prentice to come up and say a few words.

**Dr. Barry Prentice, Director**

*Transport Institute, University of Manitoba*

Thank you Doug. Let me start by saying that it is with considerable pride that the University of Manitoba hosts the first Kent Healy Memorial Lecture in Canada and we very much appreciate the support from the Kent Healy memorial foundation in sponsoring the event. The topic of short lines is extremely pertinent to our region, especially as we now go through a phase of deregulation. I think there could be no more appropriate person to deliver this lecture than the good professors namesake. Kent, I am sure Professor Healy would have been very proud
to have been here today. Please let me present this small token of our appreciation in memory of this day. Thank you very much. In the spirit of Professor Healy, I would like to open the floor to questions.

**Questions/Comments**

**Q.** Could you comment on the staying power of short lines and their chances for success?  
**Kent Shoemaker:** I do not know of a short line where one of the concerns of shippers was staying power. Quite frankly it has not been any greater a problem for short lines than for some weaker larger carriers. When you have in excess of 300 companies obviously you will get your strong ones and your weak ones. Short lines are not insulated from failure. In fact, I think we will probably see some failures in short lines from time to time. But as a general rule it has not been an issue. One of the reasons for this is the very growth I talked about. Keep in mind that this growth was achieved while in most cases the selling Class I retained rate making authority. That growth has to some extent insulated much of the industry from the kind of concern you are raising.

**Douglas Mutch, Executive Director & CEO**  
**Canada Grains Council**  
**Afternoon Chair**

My name is Douglas Mutch, and I will be chairing this afternoon’s sessions. What we are talking about this afternoon is “Rail Restructuring: Implications for Agriculture” and, as our luncheon speaker illustrated, rail transportation and agriculture are inextricably linked; changes in the rail system definitely have implications for agriculture. We are very fortunate today to have with us Dan Stirling, Director of Grain for Canadian Pacific Railway. Dan holds a B.Sc. in Civil Engineering from Queens University and an MBA from York University. Dan has been employed by Canadian Pacific for over twenty years, working in Montreal, Calgary and Winnipeg. Please welcome Dan Stirling.

**Dan Stirling, Director Grain,**  
**Canadian Pacific Railway**

**Rail Restructuring: Implications for Agriculture**

Thank you Mr. Chairman, ladies and gentlemen. Well you certainly have picked a timely topic. Railway restructuring is happening throughout North America, as many of you are no doubt aware. The agriculture industry has undergone a number of changes, the magnitude of which can be measured by looking at the consumer price index. There have been significant decreases in our major commodity prices over that period of time. Since 1987 when the National Transportation Act was introduced, our prices first remained flat for a period of before falling.
They have since rebounded in 1995 and 1996. As a result of those prices going down, our cash flow was squeezed significantly and we had to cut back on our capital investment for a significant period of time, in fact, up until 1994.

I would like to take a few minutes to summarize the restructuring that has taken place in North America. In the US the major moves were the merger of Burlington Northern and the Atchison, Topeka & Santa Fe to form the BNSF, and Union Pacific’s takeover of the Chicago & North Western (CNW) and subsequent merger with Southern Pacific (SP). In the eastern US the major story was, of course, the attempt on the part of CSX and Norfolk Southern to carve up Conrail. Meanwhile, in Canada we have watched Canadian Pacific and Canadian National go through their changes, in particular the privatization of CN. As a result of these mergers and takeovers, their are essentially three regional monopolies whose line interconnect and whose markets overlap. The significant factor in all of this is that each of the four largest US railways are significantly larger than either CP or CN. That fact presents some real challenges to both CP and CN, because neither of us have a significant volume of traffic (probably in the order of 25-30 per cent of overall) going south of the border.

Given this situation, CP decided to radically change its operations and focus. Three principles have guided this process of change: i) divesting non-core assets; ii) investing in core operations (in some cases using proceeds from the disinvestment as monies for reinvestment) and; iii) improving our structure and processes to be more competitive. Now I would like to show how we have applied those principals.

The first step was to move the corporate head quarters from Montreal in 1996, where we have been since 1881, to Calgary. This involved the move of over 1000 people, not only from Montreal, Toronto, Winnipeg, Vancouver, Minneapolis and Albany, NY, to Calgary. One of the objectives of the move was to change CP’s corporate culture.

The second step was to cut administrative costs by 25 per cent, primarily through elimination of administrative management and professional staff. Other cost cutting measures included creating the St. Lawrence and Hudson Railway, a regional which operates a section of CP line from Chicago to Detroit and to Toronto and Montreal. CP also acquired the Delaware & Hudson which operates in the northeastern US from Buffalo through New England and as far as Philadelphia and Washington.

We also consolidated many of our repair facilities and sold some lines, the largest of which was our so-called “corn lines”-- branch lines in southern Minnesota and northern Iowa. We sold those to an organization called the Washington Organization which is based in Missoula, Montana; they are now called the IN&N Rail Link. If all goes according to plan and we get regulatory approval, from the Surface Transportation Board, we will end up retaining a third of the equity in the new company, and an interest in ensuring that the company is viable over the long-term. This gave us a significant infusion of cash. Other line sales, include one in Quebec running from near Ottawa through Montreal to Quebec City. There are more sales on the books. The significant aspect of these sales
is that they represent the source for about half of our total investments in the railway at the moment. Unfortunately, you can not do that forever.

I now want to talk about some of the changes in the grain handling industry in western Canada; this will be old hat for some of you. First was the Crow Rate, followed by the move to compensatory rates. At that time we were looking at about $200 million per year in revenue from western Canadian export grain. In 1995 the WGTA subsidies, which replaced the Crow, were eliminated. Through all of this change, we have seen a switch from eastern corridor (Thunder Bay and beyond) dominance to western corridor dominance (Vancouver) as the port of exit for export grain.

Coupled with this fundamental change to the grain supply chain are a host of other changes. First we have seen a significant increase in farm size over the last decade. Today approximately 75 percent of all grain is produced by only 30 per cent of the producers, and that percentage will grow. We have also seen changes in export destination. In particular, big customers like Russia have virtually disappeared from the marketplace overnight. We have seen a proliferation of grades and increased demand for identity preserved grain. We have seen a massive reduction in country elevators, and this is very significant, perhaps more than many people realize. Since 1971 the number of country elevators has reduced by about 75 percent; since 1987 they have reduced 30 percent. And there is yet more consolidation to come. More recently we have seen an increased market presence in western Canada of multinational US grain companies, such as ConAGRA and ADM. We have seen a real frenzy in elevator construction over the last year, and I think we will see more of that. Finally, we have seen an acceleration in value-added activities, everything from a small flour mill in Elie, Manitoba to the proposed ConAGRA plant just outside Fort Saskatchewan (it will consume something like 700,000 tonnes of barley a year).

What has driven these changes? Although there are many factors, there are probably four major ones. One is the substantial reduction in government subsidy -- we are finally going to have to do it on our own. Another is the economics of re-investment. At the height of the investment in the elevator and the grain handling and transportation system in the mid-1930s, there were not highways everywhere so the average length of haul was probably only five or six miles and that was by horse and wagon. Such was the economics of transportation that determined the size and distribution of country elevators. Now, the size of the new country elevators is determined by the economics of B-trains with capacities of up to 40 tonnes. A third change is, of course, global competition. We are no longer competing only with the US, but also with Australia, for example. Finally, technological change in agriculture has been a constant. All these factors -- deregulation, globalization, consolidation, etc -- are the key forces driving CP Railway and other carriers.
At the moment the grain handling and delivery system has a very local bias. The majority of deliveries are done by the farmer using his own truck. The elevator system, despite all the reductions, is still probably over built for what we really need in the long-term and by most standards few have been efficient. From CP’s point of view our rail network was over built and this will continue to be a challenge. The branch line system continues to be an enormous cost.

We have a system whereby at quite a few nodes we assemble trains with cars pulled from branch lines, put them back on the main line and take them to port or final destination. This is older technology, as many of the government rail cars are 25 years old. Some of the new cars coming on line are very different and very exciting.

There are many lines that we think should not be abandoned, but rather operated by others who can do it cheaper for everyone and probably provide better service too. Of the three lines we are currently looking at -- Elk Island in Alberta, Outlook in Saskatchewan, and Arborg in Manitoba -- we are getting the most interest in Outlook. We have not decided if it will be a sale or a lease. There are other lines that we are evaluating. On the whole, I think we are moving forward rather quickly.

What does this all this mean for investing? We decided that we had to re-invest if we wanted to be there for the long run. In 1997 we will spend close to $700 million, more in 1998. A significant part of that is going to be new locomotives. Between 1995, when we acquired about 83 new A.C. locomotives, and 1999 we plan to acquire 344 more. We will have the largest A.C. fleet in North America with an average age on par with the other major railways in North America. These are the best units in the world today for moving both commodities. These units are for the large part going to be based in western Canada moving grains, and most of them will be based in western Canada.

We have also made significant investments in other areas, such covered hopper cars. We have recently acquired 3900 new “286” covered hoppers (referring to the maximum weight on rail, 286,000 lbs). Our network is quickly getting to the point where the main grain collection facilities will all be able to handle 286,000 lb. cars. We have tested new 315,000 lb. cars, but at the moment have no concrete plans to take the track to 315,000 lb. It is something that is being studied, however.

Just as important as these investments is the $100 million we are spending on new Information Systems, including the Internet. For example, we now have a bilingual web site and are constantly upgrading its quality, in terms of customer interaction and service. We have also implemented Automatic Equipment Identification on our cars, something all North American railways have done in order to better track and trace their equipment. Similarly, we will be putting GPS (Global Positioning Systems) units on our locomotives so we can more precisely locate them.
Perhaps most importantly we are completely redesigning all our computer systems. We have implemented a Service Excellence Program (SEP) to re-design the interface between technology and users. What we have found is that once you have put new technology in place, it requires changing work patterns, training and on-the-job learning.

On the supply chain as a whole, I think we all agree that the roles of the different participants are confused or not clearly defined. It is much too easy to not admit responsibility and we are all guilty of doing that in one degree or another. So where do we have to go from here? First, we have to move forward with the 1999 rate review as quickly as possible. We believe, from our perspective, that a commercial environment for rates, car allocation, and logistics will produce the best system for everyone in the long run. Finally, we believe that accountability should be the guiding principal as we put those new systems into place. Thank you very much.

Douglas Mutch
Afternoon Chair

Thank you very much Dan. When I was asked by Barry to chair the afternoon session I felt it was a bit of a consolation prize because my first choice would have been to be one of the reaction panellists for this session. However, we do have some excellent people, and I can see why Barry made the choices that he did. Our first commentator is Paul Earl, Policy Advisor with the Western Canadian Wheat Growers Association. Paul has extensive experience in the industry, including a decade as Executive Director of the Grain Transportation Agency, before being with UGG. Currently he is working on a biography of Mac Runciman, former President of UGG, and is doing some other independent writing. He recently completed his doctorate degree in History and Agricultural Economics. Please help me welcome Paul Earl.

Reaction Panel

Paul Earl
Policy Advisor,
Western Canadian Wheat Growers Association

One of the first things I would like to comment on is Dan’s discussion of the building frenzy of new country elevators or new country handling facilities. These facilities are what those of us who have been involved in grain transportation reform for many years were saying had to be built: very large concrete facilities that could originate unit trains on. At the same time, we have to recognize the increasing market fragmentation -- the increased number of grades, increased number of customers, increased number of destinations, the greater use of identity preservation and so on.
I think the issue now is whether in fact we are building the right kinds of facilities to handle an increasingly fragmented product into an increasingly fragmented market. In fact, I know of one former senior executive of a large grain company who refers to these facilities as monuments to stupidity.

There are three principal issues that have plagued the grain handling and grain transportation systems for two decades -- branch lines, the rate structure and rate inflexibility under the Crow Rate, the WGTA and now the rate cap, and logistics management issues (i.e., how and who controls the movement of grain). Certainly the branch line issue, I would say, is well on its way to being resolved. Dan showed his map of the CP network, and referred to the increasing number of short lines, getting rid of low density branch lines and so on. The rate issue is at least partially dealt with. We have gotten rid of the subsidy, the Crow, and the WGTA, but we still have the rate cap. We still have what is essentially an inflexible rate structure. The railways always make this point, validly I think. After all, it is not as if they can charge lower rates on efficient movements because they would have to make up their costs on inefficient ones. The rate cap is really designed to cover their costs on average, that is, on efficient and inefficient segments of the system. The rate review is, of course, coming up in 1999.

Logistics management, however, we have hardly addressed, even though it really is something that has been issue for many years, going back to the 1975 Grain Transportation Authority. It remains a major issue for the agriculture industry.

**Reaction Panel**

**Gene Griffin, Director**

*Upper Great Plains Transportation Institute*

*North Dakota State University*

Thank you Doug. I would like to address two things. First, I would like to give you my perceptions of what is currently happening in the United States. Then I would like to compare them with some of the things that Dan discussed.

In my opinion all is not well with the United States transportation system. There are some pretty dark clouds looming, especially regarding rail regulation and specifically the concentration that has taken place in the industry in the last couple of years. I think it does us good to think about rail service in the context of a continuum. At one end the ideal is tailored customer service, driven by logistics trends, while at the other, is the goal of optimal rail transportation efficiency. In other words, it is customer service versus efficiency. The difference between the two objectives is that one is customer-oriented and looks at the whole system, including not only different modes but
also inventory, plant location and warehousing -- what is now commonly called logistics. The other objective involves a carrier who, doing what we would expect them to do in a competitive market environment, wants to maximise profits by making their portion of that logistical chain as efficient as possible. These two things are at odds with each other.

The US situation I would like to describe, has three elements to it: the transportation system, the country grain handling or merchandising system, and production agriculture -- farmers.

In the entire United States, there are four Class I railroads (assuming that ConRail is eventually dissolved and divided between two other carriers). This network is served, as you heard over lunch, by a number of short line railroads whose continued presence on the transportation landscape in the United States is not assured in my opinion. One of the things that is probably going to have as much impact for those systems as anything else is the 104 car rate. In the end you have to ask yourself the question: why would Class I carriers want short lines if they didn’t need them? Many short line systems are known as car counters because they get a basic fee per car that the deliver to the rail road, one hundred, three hundred dollars a car whatever it might be. There is no accounting for how much it costs for that short line to originate that car. Well, if Class Is can eliminate that cost and capture the same revenue why wouldn’t they do it.

The country grain handling or marketing system in the Upper Great Plains (North and South Dakota, Minnesota, Montana) has also seen an extreme amount of consolidation since multi-car, unit-train rates were introduced 18 years ago. And that consolidation continues. What has happened in the last six months alone is fairly dramatic, and I understand that it is happening up here as well, is the establishment of the 104 car rate and the use of shuttle trains (these are very similar to what short lines have done -- the power stays attached and the crew rests). It involves moving 104 cars out into a country station while the crew rests for ten hours. The train is loaded, goes to port, is unloaded and returns to another origin, not necessarily the same one. I think that this 104 car system is driving much of the investment in the great plains area right now. I know of one large co-operative which has poured the footings for a facility despite not having a rate published for that station. There are ten stations for which the 104 car rate was published.

Finally, looking at production agriculture, what we are seeing is continued consolidation, caused mainly by the elimination of the farm program. The farm program meant tremendous price stability. I heard someone this morning, a producer talking about we need price volatility. To get price volatility you had better have size because you are going to need staying power. I think the end of the farm program will drive farm sizes upward more than any other factor. In fact, I think it is going to double and triple the farm size. The mood among average size
farmers is very pessimistic right now. In fact, I think 2000 acres is not going to cut it, especially in the semi-arid part of the country.

Let's shift gears a little bit and talk about rail restructuring and its implications. I think it does us all well to go back and revisit Michael Porter's five factor model of competition. I do not think farmers, country grain elevator people, rail road people or truckers are bad people. It is the system that is bad. People merely react within the system in which they are operating.

Many of the changes Dan mentioned are also affecting the Upper Great Plains, even the increased presence of US multi-nationals. Of the ten 104 car stations in North Dakota I believe only one is a locally owned co-operative, or elevator of any type for that matter. The rest of them are all major grain firms. We also went through the frenzied country elevator construction, as a pre-emptive strategy, and we will probably over-build too. The whole value-added industry is also a factor. Burlington Northern does not like it, for example, because they do not get much of that out-bound traffic, as it is generally not moved in bulk.

Overall I think the US situation is very similar in some respects, but very different in others. Where I think it is different is in institutional and regulatory arrangements. For instance, I had a chance to talk with the Governor of North Dakota, and he was saying there is a feeling among some that a move back to the more comprehensive regulation that we had prior to Staggers is desirable. Then there are those who feel there should be open access. But are we prepared to just let any railroad operate on anybody else's track? That idea is fraught with problems, even though it would increase competition. Then there are those who feel we should tinker with the Staggers Act, to beef-up provisions which protect captive shippers. My hope is that we can develop some kind of institutional structure or framework that allows railroads to prosper, because although what he had prior to Staggers was no good, there was a certain amount of equity and producers also prospered. Thank you.

Douglas Mutch
Afternoon Chair

For the second part of the afternoon session we are talking about gateways for grain. Our initial speaker is Brian White, Director of Market Analysis with the Canadian Wheat Board, a position he has held since 1990. Prior to that he served as a marketing manager in the Wheat Board sales department for the Soviet Union, all of Europe and North Africa. Brian holds an MBA from the University of Toronto, and a MA degree in Russian history from Carlton University. He is fluent in Russian, French and German. He has a wealth of information and I am looking forward to his presentation. Please join me in welcoming Brian White.
Thanks very much Doug. I want to thank the University for having the Wheat Board on the program today, although as evidence by Paul Earl’s remark, even when we are not on the program we are on the program. What I want to discuss today is a version of our new long-term forecast which I originally gave at the Canada Grains Council meeting a couple of weeks ago now. This will differ only in the sense that it will be less detailed and will focus on what we see as the likely directional movement of Canadian grains and oilseeds to export ten years from now.

I should mention that every two or three years we do a long term forecast of where things are going in the world grain markets five to ten years down the road. This forecast is not quite as elaborate as the previous one in terms of the number of countries that we looked at. There were fewer individual countries that we looked at in this particular forecast and there were fewer factors which we tried to forecast for. Even though there were fewer individual countries, we basically took a major players approach and tried to look at who were the major importers and who were the major exporters of grains in the world, particularly the grains we are marketing which are wheat and barley.

To give you an example, in the Asia Pacific region we looked at the following individual countries: China, India, Bangladesh, Indonesia, Japan, South Korea, Malaysia, Pakistan, Philippines, Sri Lanka, Taiwan, and all the other smaller countries are aggregated into an “others” category. As I said it is a major players approach.

Let me just mention, by way of explanation, what the key drivers are behind increases in world grain imports. They are very simple to identify: world population growth, growth in per capita incomes, urbanization (which contributes to dietary shifts). For example, if you look at trends in the Asian region, which is historically a big consumer of rice, there is a noticeable a shift from rice consumption to wheat consumption that occurs with urbanization and increases in per capita income. Other factors are whether or not a country can feed itself, whether or not it faces limits to grain production, or production choices (i.e. where it is better for the country to produce something else other than grain). Examples of countries which face limits to grain production are Iran, Algeria, Morocco, and Tunisia. Countries that have to make choices on the basis of relative comparative advantage are countries like Brazil and Argentina. We have seen a big drop in Brazilian wheat crop production since the late 1980s, as they realized it doesn’t make much sense for them to be producing wheat when they could put that same acreage into soybeans and corn and import the wheat.
For the base period, 1992-1996, the total world wheat trade was roughly 100 million tonnes. We are forecasting it will grow to 126 million tonnes by 2007. The total barley trade for the base period was about 15.5 million tonnes and we see it growing to about 20 million tonnes. Malting barley is growing from about 3 million tonnes to about 4.5 million tonnes and feed barley shows growth as well. The largest growth in demand is expected in the regions of the Asia Pacific and the Middle East. China, we found, is a real wild card for forecasts because we don’t know the extent to which they can increase their wheat production nor do we know the extent to which their wheat consumption might increase. World trade in durum wheat is projected to increase from about 6 million tonnes to about 8 million tonnes by 2007. With regard to course grains there is strong growth expected from about 90 million tonnes to about 123 million tonnes in the forecast period. In the case of barley, most of the increase in barley imports is expected in Saudi Arabia and Iran got feed barley, and China for malting barley. Doug Mutch mentioned the lost import demand represented by the Soviet Union and China wheat imports also fell fairly dramatically particularly in the last two years. Doug raised serious questions about whether or not we could break out of this pattern. Based on our forecast we do see ourselves breaking out of this pattern and going from about 100 million tonnes to 126 million tonnes over the next ten years.

Wheat
Where do we see that growth occurring? I have ranked the countries in terms of the amount of growth and you can see that most of the growth is in Asia Pacific, the Middle East, Africa, and Latin America. There are large declines in some other exports to the US, marginal increase in exports to Europe, and decline in export to the former Soviet Union. If you look at how the shares breakout, you can see that the share of world wheat trade going to the Asia Pacific region is going to grow from 32 percent to 36 percent. Africa is actually declining. Although there is growth in tonnage, as an overall percentage it is going to decline. Latin America is going to grow very slightly and the Middle East is going to grow from 11 to 13 percent. Again, the big drop is in the former Soviet Union, which at one time was an importer of more than 20 million tonnes; it now imports about 2 million tonnes.

On the export side of the picture the number one wheat exporter in the world, is of course, the US where we see exports growing by about 4.4 million tonnes. Our own exports for the 1992-1996 base period were 19.1 million tonnes but we think that will grow to about 22 million tonnes over the ten year time frame. That may seem like fairly modest growth, and in fact we have had wheat exports from Canada above 25 million tonnes (in 1991 and 1992), but it can be explained by something I am going to discuss a little later which is the likely acreage allocation that will happen in western Canada (i.e. how much acreage will go into wheat, what production that will sustain and therefore what exports that will sustain).
The European Union we see gaining about 4.3 million tonnes to go above 20 million tonnes, Australia 16.5 million tonnes, and Argentina 11.5 million tonnes. Taken collectively these exporters account for about 88 percent of world trade.

In terms of market share, the US’s share actually declines in our forecast because world wheat trade will rise to 126 million tonnes and there exports will not go up by quite as much. Our own wheat export share will also decline, the EU will hold its market share, Australia increases and Argentina increases. In Argentina there is still a lot of acreage that can go into wheat production, so they can meet demand if it is there.

**Course Grains**

For course grains, again it is a situation where the Soviet Union was one of the world’s largest corn importers (between 15 and 20 million tonnes of corn), second only to Japan, and now imports none. It has basically dropped out of the market and that has caused course grains trade to stagnate. Nevertheless, we think course grains can grow from their base level of 90 million tonnes to 105 million and possibly 123 million tonnes by 2007. It too is basically driven by those key drivers I was highlighting: urbanization, growth in incomes, and a change in diet, as the shift towards meat demands more feed grains. The major growth areas we see for course grains imports are again Asia Pacific, particularly Korea, China, Taiwan; the Middle East (Saudi Arabia and Iran); and Latin America (Mexico, Columbia, and Peru).

**Barley**

For barley exports, which among the course grains is the commodity of most interest to us here in western Canada. There was a time when we used to sell the Soviet Union between 1 and 1.5 million tonnes of barley every year. Now they don’t import any. The other declines are in Europe and Africa. The base year average for barley trade was 15.5 million tonnes and we see it growing up to about 20 million tonnes, largely driven by Saudi Arabia, Iran and a few other countries. Among the major barley exporters, the European Union is the major barley exporter and has been for several years; they produce about one third of the worlds barley (about 50 million tonnes). Australia is the second largest exporter (3.5 million tonnes) and we exported 3 million tonnes in the base period, but see that growing to about 3.2 million tonnes ten years down the road. One of the things we did not factor in for this forecast, but I should mention, is the fact that ConAgra is building this plant north of Edmonton which will demand lots of barley (I think the figure is around 700,000 tonnes). The US exports 1.3 million tonnes in the base period and we saw them going to about 1.5 million in the forecast. In Canada and the US the reality is that barley has to compete for acreage with other crops. Then there is a question about domestic value-added, in Canada anyway, and livestock demand for feed barley. In terms of market share, we see the EU going from about one third of the world trade to 40 percent, while Australia, Canada and the US will all have declining shares.
I should mention in passing that Russia and the Ukraine are already exporting feed barley to the world market. We are having to compete with them, particularly for sales to Saudi Arabia and other Middle East destinations. I just want to say a word about malting barley, because it is obviously different from feed barley, it has its own market. China is already the world’s major malting barley importer at 1.2 million tonnes in this base period, and the forecasts has them growing to about 2.4 million tonnes of malting barley in ten years down the road. The US forecast is unchanged at about 500,000 tonnes, while Columbia, Brazil, Mexico and Canada all will see growth. The major malting barley exporter is Australia. They exported 1.2 million tonnes in the base period. We see that growing to about 1.8 million tonnes in the forecast period and that is entirely achievable for them, in my opinion. Canada exported roughly 1 million tonnes in the base period but we have been above it recently and it is entirely possible for us to be exporting about 1.6 million tonnes of malting barley soon. The EU we saw virtually doubling there malting barley exports. Overall, the total malting barley trade in the base period was roughly 3 million tonnes; in the forecast period we saw it going to 4.6 million tonnes.

Our forecast for how the western Canadian acreage will turn out explains why we are not able to increase our wheat exports to the level that would allow us to maintain our market share. For the base period we had about 30 million acres in wheat and about 10.5 million acres in barley. We know there is going to be more demand for barley for feed such as for the ConAgra plant. There is also going to be demand for malting barley. So we forecast barley acreage growing from about 10.5 million acres to about 12.5 million acres. We see Canola going from about 11 million acres to about 12.5 million acres. If anything, that is a modest forecast for Canola acreage. I think people in the oilseed business in Western Canada would argue that Canola acreage could reach as high as 14 to 15 million acres. Summer fallow we took down fairly dramatically, from 17 million acres down to 11.5. So, with only about 78 to 80 million acres to work with in western Canada, we have to allocate the acreage. What will determine that is, of course, the relative prices and returns.

We combined Agriculture Canada’s forecast and ours to get an aggregate tonnage of what we would be talking about in term of grains and oilseeds exports. You can see that our total grains and oilseeds exports will be about 32 million tonnes by 2007. That gives you an idea of what we think the aggregate exports would be. In our previous forecast we were a little bit higher because we were a little bit higher on wheat, I think we were somewhere around 34 million tonnes ten years down the road but now we are back at about 31.6.

The question that this conference asks is, of course, what would be the likely directional movement for Canadian grains and oilseeds exports based on our forecast? The answer is for the base period of 26.5 million tonnes of grains and oilseeds exports, about 16.5 went through the west coast, about 7.5 went through eastern corridor, and about 2.3 million tonnes went southward. If we look at 1996, the latest complete year, only about 15.5 million tonnes went through the west coast, more went through the eastern system, but that was primarily because of the congestion
problems we had on the west coast (we had to switch a lot of cargo to the east coast). As we look at 2007, we see about 4 million tonnes potentially going US direct from the Prairies, about 20.5 million tonnes through the west coast and about 7 million tonnes through the eastern route. Obviously it is highly speculative to try to project the export corridors because it will depend a lot on the relative freight market. There are some markets that it would seem logical to serve through the eastern system, for instance, (e.g. the east coast of Brazil) and yet we serve it to some extent through the western system because of the relative costs of ocean freight versus the Seaway. It is really the relative costs of serving different markets that will determine what export corridors we are using for exporting not only Wheat Board marketed grain but also non-Board grains. Thank you.

Douglas Mutch  
Afternoon Chair

Thank you very much Brian. Our first reaction panelist is Lance Norman, Executive Director Marketing for OmniTRAX. Lance was born in Moosejaw, SK but received most of his education in Montreal before earning his law degree from the University of Manitoba. Outside his law practice he was active serving as Executive Director of the North Main Development Corp., and the North Main Business Improvement Zone. Lance has been Executive Vice-President of the Manitoba Chamber of Commerce since February 1995. Lance is a full-time lobbyist who regularly meets with government and provides input from a business perspective to a wide array of committees and boards. Please join me in welcoming Lance Norman.

Reaction Panel

Lance Norman, Executive Director Marketing,  
OmniTRAX

Thank you very much it is a pleasure to be here. By way of background I am the new marketing person for OmniTRAX, which is a company based in Denver, Colorado that owns several (about 14 or 15) short line railroads in the United States. It also now owns 2 railroads in Canada, the Hudson Bay Railroad (HBR), north of The Pas to Churchill, and the Carlton Trail railroad (two subdivisions in Saskatchewan between Prince Albert and Saskatoon), and one port company, the Hudson Bay Port Company.

In terms of the implications to the Hudson Bay Port Company, the conservative projections of modest growth in demand for our staple product — mainly non-durum wheat — we feel we are a competitive route. Obviously it is consistent with the Hudson Bay Port Companies long-term business plan, provided that the supply remains within
the catchment area of Hudson Bay Port. In short, the Wheat Board’s latest projection means that the Port of Churchill will be viable over the long-term.

Perhaps I could clarify what exactly is the business plan for the Hudson Bay Port Company, because I am sure you have heard a variety of things. First, the plan of the Hudson Bay Port Corporation is to be the terminus of the short line railroad, which is the shortest, fastest, cheapest transportation route for certain products to certain customers for certain times of the year. The elimination of the WGTA will highlight the actual costs of moving grain to the final customer and as will the changes in rail and ocean rates; exporters are constantly looking to improve there margins. Those factors work in the favor of Churchill. There is a dual role for any short line. The first is to understand the your Class I partner, your big customers, the grain companies and shipping companies so as to understand there needs. There are equipment loading and other operational considerations that have to be kept in mind with respect to the Class I partner. OmniTRAX is committed to making those investments. The second role is to remain flexible for your captive or smaller customers’s needs, those things that give the Class I railroads their headaches. In short, short line railroads really have to stand with one foot in each of two different canoes and OmniTRAX has done just that to great success in the US. OmniTRAX and brings that expertise to bare in Manitoba and obviously would not have invested money if they were not assured that there was potential in that route.

What are some of the tangible examples of OmniTRAX’s commitment? First, we are now able to unload aluminum hopper cars on the rail. Churchill is closer to most European countries on average and thus offers potential savings. We are currently looking at new sonar, radar and Information Technologies to help with ice-breaking and navigation. There is also a lot of deferred maintenance, both on the rail line and on the port, that is currently being done. The integrated rail/port handling facility will also assist in terms of customer service. There is also active talk of setting up a container terminal of some fashion along the system.

I suppose I should also clear up some other rumours. OmniTRAX is not counting on new mining opportunities in the north, although from all reports there are record levels of mining exploration in Manitoba and Northwest Territories and obviously Hudson Bay Railroad and Hudson Bay Port will be beneficiaries of that if it comes to be. We are not counting on Space Port Canada, despite negotiations under way to import Russian launch vehicles. We are not counting on concentrate coming from Boisse Bay to be smelted at Thompson. We are not counting on any new global trade conditions that may make Churchill even more competitive. Nevertheless, all or anyone of those things, if they come to fruition, would obviously stand Churchill in good stead in terms of the port and the railroad. Thanks very much.
Douglas Mutch  
Afternoon Chair

The second reaction panellist is David Gardiner, President of the Western Transportation Advisory Council (WESTAC). David began his career in transportation in 1965 as a research analyst with Canadian Pacific, and has since held a number of prominent development and management positions in various sectors of the transportation industry in Canada, Bermuda, and England. From 1979 until 1994 his career centered on the marine industry in Canada, where he served as president of two shipping companies on the Great Lakes. Mr. Gardiner was appointed the president of the Western Transportation Advisory Council in 1994. With WESTAC he directs the activities of a professional staff managing a comprehensive program of publications, conferences and workshops designed to advance the interest of all participants in the transportation industry in Western Canada.

David Gardiner, President  
Western Transportation Advisory Council (WESTAC)

I will try to talk in terms of a west coast port reaction to the forecast that Brian put out. It is not simply a matter of how many tonnes are going to come out of the west coast and will the terminals handle it. The ports on the west coast are facing a whole lot of issues, not the least of which is getting a handle on where the grain trade is going. They are looking at the competing commodity interests, the changing demands on parts of all of the shippers, a case in point being the loss of one million tonnes a year or more of potash permanently to the Port of Portland. They are looking at institutional and practical barriers to efficiency, both within the port and in the surface transportation system leading to the port. They are looking at funding priorities and availability amid times of restraint. They are trying to wrestle with the need for speed and flexibility in responding to shipper demands, concerns about the collection system, particularly in grain with its elevator consolidation. Then there are environmental concerns — it is not a popular business in the lower mainland these days, operating a port.

The Wheat Board’s forecast was essentially saying that west coast ports will be asked to handle around 20 million tonnes a year. I have two comments on that. First, in 1994/95 when the Board did a similar projection, the forecast was for 23.5 million tonnes. Essentially what we are now looking at is a forecast for all grains and all oils through the west coast ports that is less than what was being forecast only two years ago. In fact, 20 million tonnes is exactly the amount that was handled in 1992 by the Ports of Vancouver and Prince Rupert combined (Prince Rupert handling about 25% and Vancouver 75%).

So, in terms of facilities at the Port, the quick answer is that the ports can handle those volumes because they already have. Let me just put it into a context for you. Vancouver Port has recently embarked on its 2020 plan. What they
are projecting is that the future growth area is in containerized traffic which has a bearing on the agricultural sector in terms of the value-added movement. When you hear Alberta talking in terms of a $7 billion value-added industry, with forecasts as high as $20 billion, as a handler and a port facility you begin to think about the implications. With the possible exception of the new grain facility at Roberts Bank, which I would suspect is not going to be driven by concerns of volume but by concerns of it being a new facility that will handle efficiently the new distribution mechanism and collection system back further, there are really no other major cargo handling facilities being projected on the lower mainland.

The real question is not will it be handled, but will it be handled well. At a recent Vancouver Port Corporation user conference the following issues were raised by shippers: the need for improved rail and road access to the port number 1, reduced interswitching delays and bottlenecks on the rail system in and around the port and extending back into the collection area, increased flexibility in the days and hours worked offered by all the terminals, increased availability of inland assembly points and equipment, particularly in the container business and improved cross communication at all levels. These were not all grain shippers but I think there may be some similarity of needs. The other issue is always lowering the costs and reducing down time, congestion or delays through the port. Now this is what the port system is responding to, and I think it would be incumbent upon the grain industry to understand that this is where the money is being spent. From the port perspective grain can either be part of the solution or part of the problem. What you have to understand is that while it is important for the grain trade to get its act together, the port is also under other pressures and grain must fit with what is going on.

Before I close I want to speak gingerly about the opportunity that is represented by the 1999 rate review. From our point of view, and I speak for WESTAC which has many transport interests, and for the ports as well, it is an opportunity to focus on the future. It should result in a comprehensive and realistic plan that will serve the industry well into the next century. It should involve all of the key stakeholders, and its leadership has to be based on the principals of balance and fairness, respect, trust and accountability. Thank you.

Questions/Comments

Q: There seem to be some changes coming down the pike, in terms of the Marine Act, possibility of the commercialization of the St. Lawrence Seaway, charges for ice breaking etc. It strikes me that a lot of those charges raise the cost of moving goods down the Great Lakes/St.Lawrence Seaway system. How does that affect those markets that you are talking about and will those price differences actually start to shift products out of the other ports?
Brain White: I am not a specialist in transportation economics but it is my understanding that we evaluate the relative costs of using various export corridors and we try to within certain constraints that we face to maximize whatever the lowest cost route is. I think it is probably fair to say that there is a critical mass in tonnage that is required to go through the Great Lakes System in order for it to be a viable economic transportation system. Those are things we would have to evaluate and have evaluated as the years go by. The boom years for eastern movement, Thunder Bay, Great Lakes, St. Lawrence were certainly in the early 1980s.

David Gardiner: I think the commercialization of the Seaway is designed to make it as efficient as it can become. The premise being that if there are costs still to be squeezed out of the system then that will happen through privatization and commercialization. I don’t know of anyone on the Seaway who is counting on a return of former grain volumes or anything like that. I think the system has adjusted, the fleet that handles the grain is largely adjusted through the consolidations and rationalizations that have gone on. It is probably in position to handle grain in the volumes that Brian is predicting for some time. They are getting close to having rail become competitive to getting grain right down to places like Quebec City, so one needs to think in terms of eastern movement as not only the Seaway System above Montreal but the rail system and the lower river as well.

Douglas Mutch
Afternoon Chair

Our final speaker is the Hon. Charles Mayor. Charlie Mayor grew up on a farm in Warden SK. He received a Bachelor of Science in Agriculture Degree from the University of Saskatchewan, with a major in Agricultural Economics. He owned and operated a mixed farm operation near Carberry MB from 1965-1996. Was first elected to the House of Commons in 1979 and was re-elected in 1984, 1984, and 1988. During this time he held portfolios as Minister of State for the Canadian Wheat Board, Minister of State for Grains and Oilseeds, Minister of Western Economic Diversification and Minister of Agriculture. He is presently the chairman of the board for the Manitoba Crop Insurance.
Please join me in welcoming Charlie Mayor.

Charlie Mayer
Closing Remarks

We are going through an era of change, there is absolutely no question about that. Change for some people is an opportunity, while for others it is a threat. I think the major change that is happening and has been happening is the change in attitude. I think that is prevalent here today. I think it has come about because we have stopped, at least to some degree, producing a product and then deciding to go out and find a market for it. This worked fairly well...
for a good number of years when we only produced two or three classes of product — wheat, oats and barley. But now we have something like 60 different classifications for board grains. That is an enormous amount of differentiation to move through the system, and it is very difficult to see how that type of demand on the system can happen without a lot of changes.

The Prairies are no longer a homogeneous area to produce product. You have the western prairies, from the middle of Saskatchewan west. To the extent that they are going to ship grain it is likely going to go off the west coast and to some extent south. This side of the prairies (east) is going to go through Thunder Bay and largely it is going to go south. So trade patterns are changing very dramatically.

We need a system that provides for competition and it is easy to see how that should be the case again when you talk about the different classifications of grain that we have to keep separate. You want to be able to deliver to your customer on time, a product that they know is very uniform and they know where it came from. Bruce Graham from Linnet Geomatics talked about GPS as a way of keeping track of product. We are going to be able to do this increasingly as the technology gets more refined and as it gets a little more cost-effective. You are going to be able to do that, it seems to me, with smaller and smaller units of grain, which has implications for the way we market and the way, in fact, we deal with our customers. To me this means continuing deregulation, and by that I don’t mean get rid of standards and everything, but rather that we have to provide more opportunity within the system to be more flexible to address the customer’s needs. When you think that CP is going to spend $700 million, $100 million of which is for Information Technology, that tells us where the focus is going to be — on the customer. It would have been interesting to have asked them how they are going to do this. What they plan to do, I suspect, is to do with tracking their cargo and to be able to keep track of where the cargo is going and how it is serves the customer. Again to me this says that at the end of the day the market is going to prevail. Unless you have that opportunity and have some flexibility within the market system, it is pretty difficult to get the right market signals.

It is appropriate that I finish my remarks with a comment on transportation, for there is absolutely no question that transportation is a key in this country simply because of how far we are from the export market. Our markets are now north/south and off the west coast. Other corridors, such as Thunder Bay, will face some rationalization. The Great Lakes fleet is also going to see some changes. Thank you.
1997 PARTICIPANTS

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Lance Norman
Honourable Charlie Mayer
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