Speaking Notes on:

Rail Service and Infrastructure Changes in the Western Canadian Grain Handling and Transportation System after Western Grain Transportation Reform

For

The University of Manitoba conference on:

THE AGRICULTURAL INDUSTRY AFTER WESTERN GRAIN TRANSPORTATION REFORM: The Good, the Bad and the Unexpected

Clarion Hotel, 1445 Portage Avenue, Winnipeg, MB,

October 23 – 24, 2003

Presented by:

Mark Hemmes, President, Quorum Corporation

Rail Services and Infrastructure

Mark Hemmes
President, Quorum Corporation

1. Introduction

I would like to begin by saying thank you for the opportunity to speak at this conference. When Daryl Kraft first called me to discuss the idea of the conference, and to ask if I would be interested in presenting, it was his enthusiasm for his work and the topic that soon gained another supporter in me. I believe that the topic and cause for this conference is appropriate and well-timed, and Ed Tyrchniewicz is to be complimented on his initiative in taking up the mantle and seeing Daryl's concept through to fruition. I am certain it will prove to be a worthy endeavor, one that will provide the industry with one point of reference for which to move forward on a number of issues.

My discussion focuses on the subject of changes in the railway industry's handling of grain in Western Canada. I will talk about the changes to the infrastructure and operation, and will discuss those changes in terms of "Why would the railways change the way they were doing things?" and "How did they go about doing so?" I will then discuss some of the outcomes of these changes. To those in the audience who did not experience the changes in the industry over the past 20 years, I hope this is an interesting lesson in the history of the grain handling and transportation system (GHTS), and for those of you who did, I trust it will be, at the very least, an interesting walk down memory lane, and perhaps provide an opportunity to consider what impacts these changes have made on the industry.

First though, I would like to talk briefly on the Grain Monitoring Program that our company performs, to provide some context to why and how it is that I come to know something on the topic of grain transportation – other than the fact I worked for a railway for 23 years.

2. Grain Monitoring Program

I am the President of Quorum Corporation, a subsidiary of the Quorum Group. The Quorum Group is a consortium of consulting and systems development companies whose market falls primarily, but not exclusively, in the transportation and logistics fields. Quorum Corporation and its full time staff are dedicated exclusively to the task of Grain Monitoring.

The Monitoring Program got its start through the reforms that came into being in August of 2000. After about a year of design work, followed by a comprehensive bidding and selection process, Quorum was awarded the contract of Grain Monitor by the federal government, and the program formally started in June 2001. The task of monitoring grain finds its roots as a policy reform coming out of the Estey – Kroeger processes. The

primary objective is to gather data on all aspects of the movement of grain in Western Canada, in order to develop and provide measures on the performance of the system, and to subsequently assess and report on this performance—in both the short- and long-terms.

So far we have published two annual, five quarterly and six supplemental reports. The Annual Report for 2002-03 and a " Producer Netback Calculator" website are currently in development. I am also very pleased to say that Quorum has been given a two year extension of its contract services to continue the Monitoring Program.

We are also pleased with the overall reception we have received from the industry. When we went to our first series of stakeholder meetings we were met with reticence by most, and even a bit of hostility by some. Over the course of the past two years and through at least three sessions with most of the stakeholder groups, we have come to be tolerated at the least, and welcomed by most. The feedback and input we receive from all parts of the industry has become an integral part of the monitoring process for us. Furthermore, we are finding an increasing number of the stakeholders, including producers, grain companies, railways, as well as provincial and federal governments, are using our quarterly reports as both points of reference and benchmarks for comparison.

I would point out that I speak today as a third party observer of the industry, not as a representative of any railway or of the government. The views that I express are my own, and are based on the facts and analysis we have brought forward through the Grain Monitoring Program. I have attempted to keep the tone of this presentation positive, some may think too positive. And there are some critical observations made and questions asked. I would emphasize that these observations are made in light of the facts, as we know them, and intended with a constructive and forward thinking purpose.

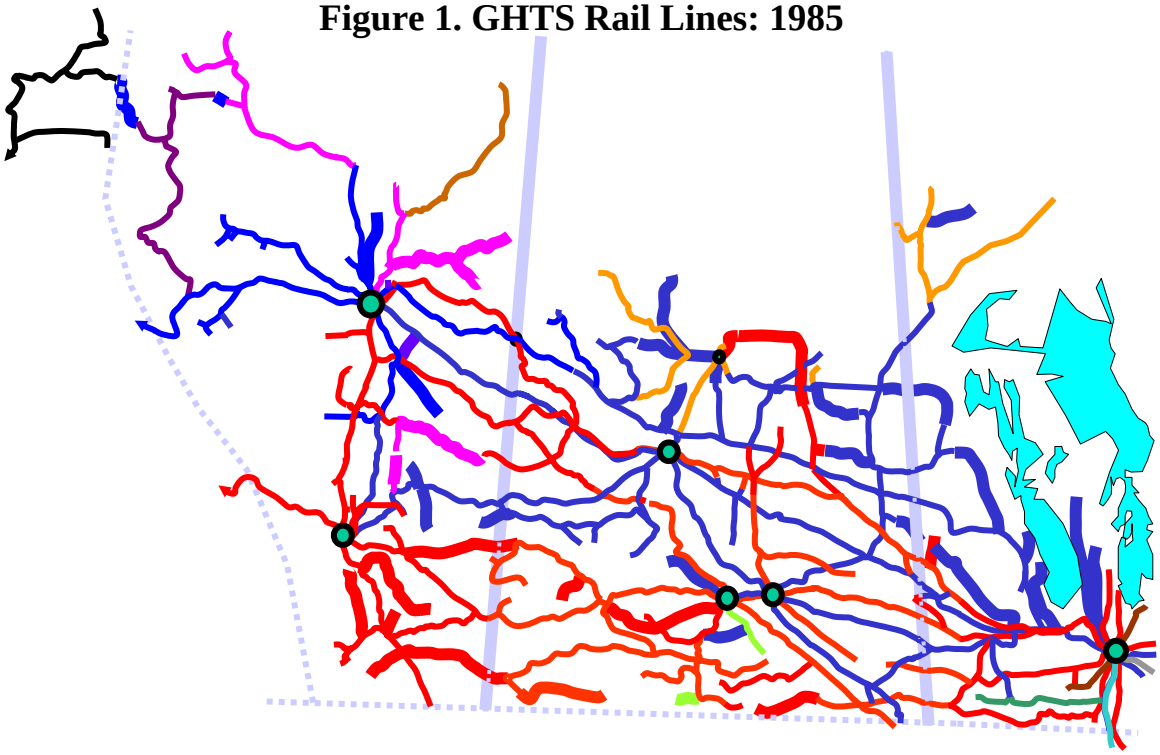
3. Railroading "Pre-1995"

The context of the discussion for this conference was to start at the time of the "last" reform—or about 1995. The statistics that I present are from either 1994 or 1999, the latter being the base year for the Grain Monitoring Program, and the former the year that the Western Grain Transportation Act (WGTA) was repealed.

However, from the perspective of railroading and where we would find the "genesis" of changes in the landscape of the industry, I think it is important to look back a few years earlier—into the early 1980s when the Crow Rate was actually removed.

At that time, the network had almost 21,000 miles of track (1985), 6,000 of which were classified as "grain dependent" (Figure 1). There were over 1,300 elevators at 880 delivery points across the four western provinces, and most of these points were served by "short" train runs in a hub and spoke manner.

Figure 1. GHTS Rail Lines: 1985



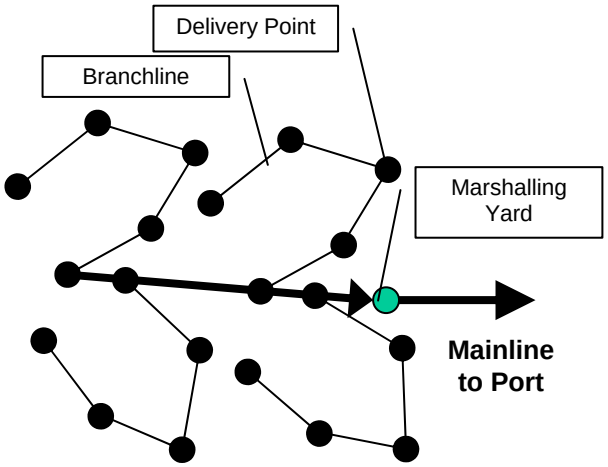
Source: Quorum Corporation

The “pre-reform” railways of the 1980s had developed to use a widespread “hub and spoke” system of distributing empty cars and marshalling loads. It is interesting to note that railways pioneered this logistics method long before the airlines picked up on it. Car allocation and train run programming were managed through the Grain Transportation Authority (GTA) in conjunction with the Canadian Wheat Board (CWB) and the railways. This involved weekly industry meetings, conference calls and ongoing daily coordination. A three to four person crew operated most train runs in a way-freight “peddling” manner. The structure of the operation was built to accommodate the infrastructure within the country elevator network.

Figure 2 is a schematic of how a typical branch line operation would be run. Empty cars would be positioned in a hub yard (an example of a hub yard would be North Battleford, Brandon or Assiniboia). The empties would then be carried to the branch line elevators on a grain run, with anywhere from one to 25 cars spotted at each elevator. Depending on the distance, the crew could stop overnight at the end of the branch line and return the next day to pick up the cars that had been loaded the previous day—or they would return to the hub station and repeat the spotting of empties on another branch line the next day. They would return to the first line on some subsequent shift three to five days later to “lift” the loaded cars. The loaded cars would then be switched and sorted to be sent on to the destination port.

Figure 2. "Old" Operational Method

- Empties to Marshalling Yard
- Grain Runs to Branch lines
  - **Deliver 1-25 cars per spot**
- Gather loads 1-5 days later
- Return to Marshalling Yard for switching to Port destined train



Source: Quorum Corporation

So, when you couple the administrative and operational methods, what we had in the GHTS of the 1980s was a heavily bureaucratic, labour intensive set of processes geared to accommodate hundreds of small operations, a few cars at a time. There was a lot of room for improvement.

4. The Drivers of Change

It is also important to briefly discuss the regulatory climate that existed at the time, in terms of how the regulatory changes affected the industry's approach to the changes that were to come. First, it is important to understand that a Moratorium on Abandonments was in place, and if a railway wanted to abandon a line, the hurdles for this process were placed very high.

There also existed a very stringent mileage-based rate structure, with escalation set by the Canadian Transportation Agency (CTA) through a regulated process. And while multi-car block incentives were starting to be used as early as 1987, the infrastructure in the country elevator network was such that few facilities could support their use.

The short line industry in Canada was still in its infancy at the time, and other competitive factors were arising as well. A good example is the realization that global competitive factors were being considered in the logistics decisions that off-shore customers were making. Therefore, railways started to compare their operations to those

in other countries, and this included not just those in the US, but in Australia and South America as well.

In terms of the statistics, total track miles in the rail network decreased from 20,758 in 1994 to 18,908 in 2003, a 9% decrease (Figure 3 and Figure 4; see Figure 1 vs. Figure 4). Grain dependent branch lines were most affected, decreasing from 6,018 track miles in 1994 to 4,481 in 2003, a 25.5% decrease. While considerable, the changes in the rail network have not been nearly as significant compared to the elevator network it serves.

5. The Western Grain Transportation Act

The passage of the WGTA of 1984 replaced the Crow Rate with a Statutory Rail Freight Rate set by the National Transportation Agency(NTA)/CTA (changed in 1987). This is when the costing review was introduced. The Grain Transportation Agency came into being through the WGTA. Prior to the WGTA, the "A" in GTA stood for "Authority," since 1979. The reforms of 1995 eventually eliminated the WGTA and the GTA, but during their period, they were a significant entity in the industry. The GTA was responsible for three primary areas, or processes, in the GHTS.

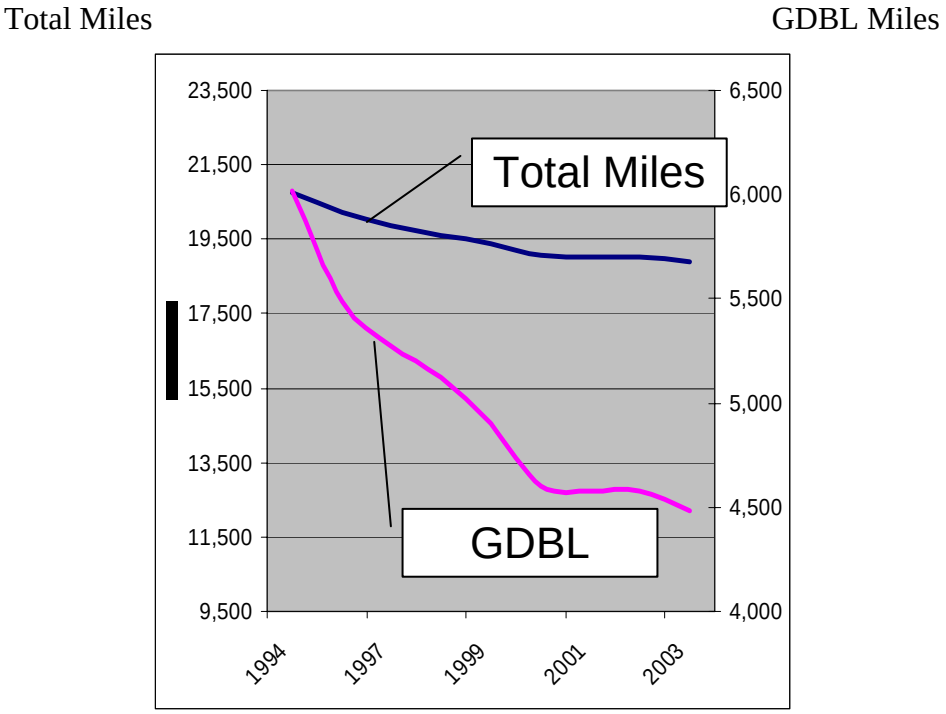
- High level allocation of cars - Board and non-board "splits," including the allocation of non-board grain cars to the grain companies. Prior to this, the CWB had distributed the cars, however, grain companies had lobbied for a neutral distribution process. The railways now perform this duty.
- Establishment of volume projections used by the CTA for setting of rates (in conjunction with the costing review data). This duty was taken over by the CTA, in part, when they took complete responsibility for establishing the maximum rate scale.
- Unload targets and performance measures (established by the industry and administered by the GTA)

6. Genesis of Regulatory Reforms

To reiterate, the repeal of the Crow Rate was the impetus for a series of changes that took place over more than 15 years and culminated in the reforms of 1995. Throughout the 1980s the Prairie Branch line Rehabilitation Program invested $890 million for upgrading 5,600 miles of track, although not all 5,600 miles received full rehabilitation work. The introduction of variable or car block rates in 1987/88 was another advancement in "commercializing" the railway approach to the market place.

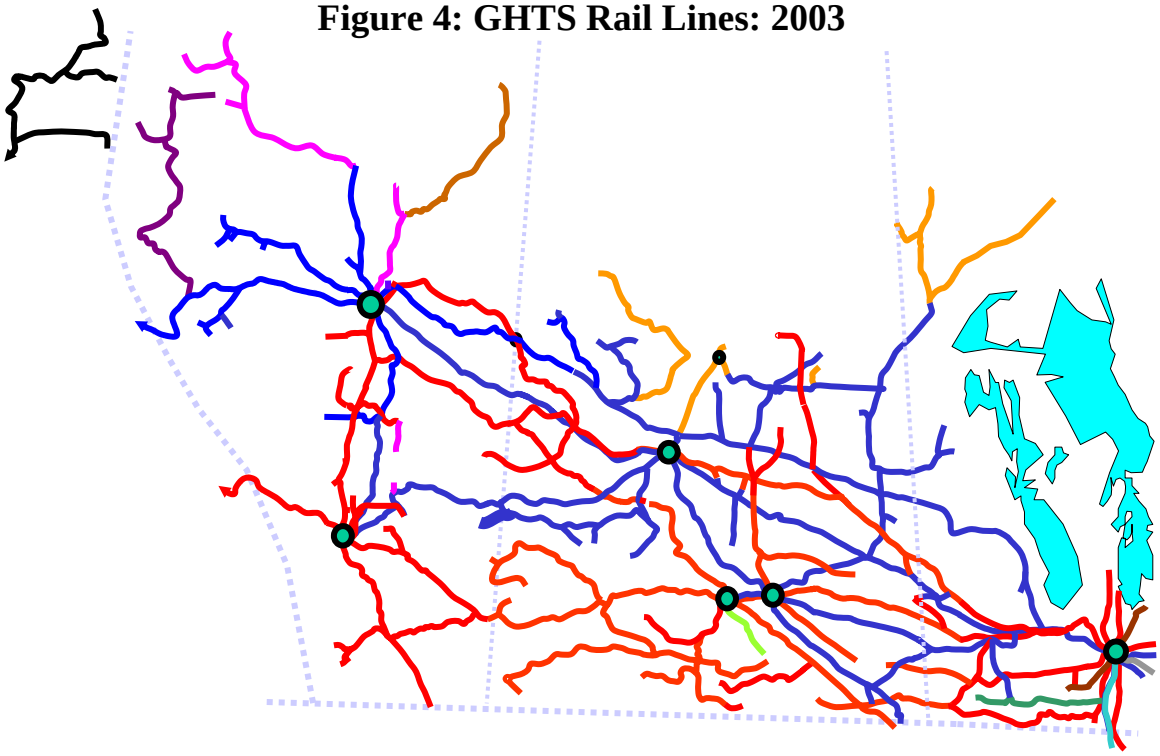
The elimination of the costing reviews in 1992, when the last one was performed, has been met with mixed feeling in the industry. When I say mixed, I mean the railways were in favour of this move, but many producer groups continue to believe the loss of this process has been a big mistake. The crux of the issue lies in the fact that the costing review provided the baseline for which the CTA would structure rate increases – taking into consideration the costs that had been driven from the system, balanced with inflationary pressures.

Figure 3. Miles in the Western Rail Network, 1994-2003



Source: Quorum Corporation
Note: GDBL = Grain dependent branch lines

Figure 4: GHTS Rail Lines: 2003



Source: Quorum Corporation

Some in the industry feel this was the method by which a portion of those cost savings reaped by the railways were passed back to producers. The system that replaced it allowed for a maximum increase based on inflationary considerations, indexed by certain allowable cost savings as determined by the CTA. The CTA then published a maximum rate scale annually, that was based on the number of miles from destination.

The 1995 reforms saw the establishment of the Robson Commission and led to the naming of what is referred to as the "Robson lines" – which were about 535 miles of track that were legislated to be abandoned. This saw the lifting of the moratorium on abandonments, and while railways were not given "carte blanche," there were now terms by which they could "convey" assets—either by sale, transfer or abandonment. They were, however, still required to maintain an abandonment candidate line list, complete with the proposed timing, and when the line came up for abandonment they were to offer the line for sale publicly.

In August 2000, one of the reforms enacted was the Revenue Cap. This reform eliminated the maximum single car rate structure that had been in place, thereby allowing railways the freedom to publish rates on a point-to-point basis at their discretion. The catch is that they are limited to a maximum cap on the TOTAL revenues brought in. The base year was set as 1998 and the maximum revenue was set through a formulaic approach that would include adjustments for such things as, for example, incentive rate payments, industrial development contributions, and interswitching. The effect of this was to reduce the single car rate immediately by 4% (effectively this was the retraction of a rate increase that had been published for the beginning of the 2000-01 crop year).

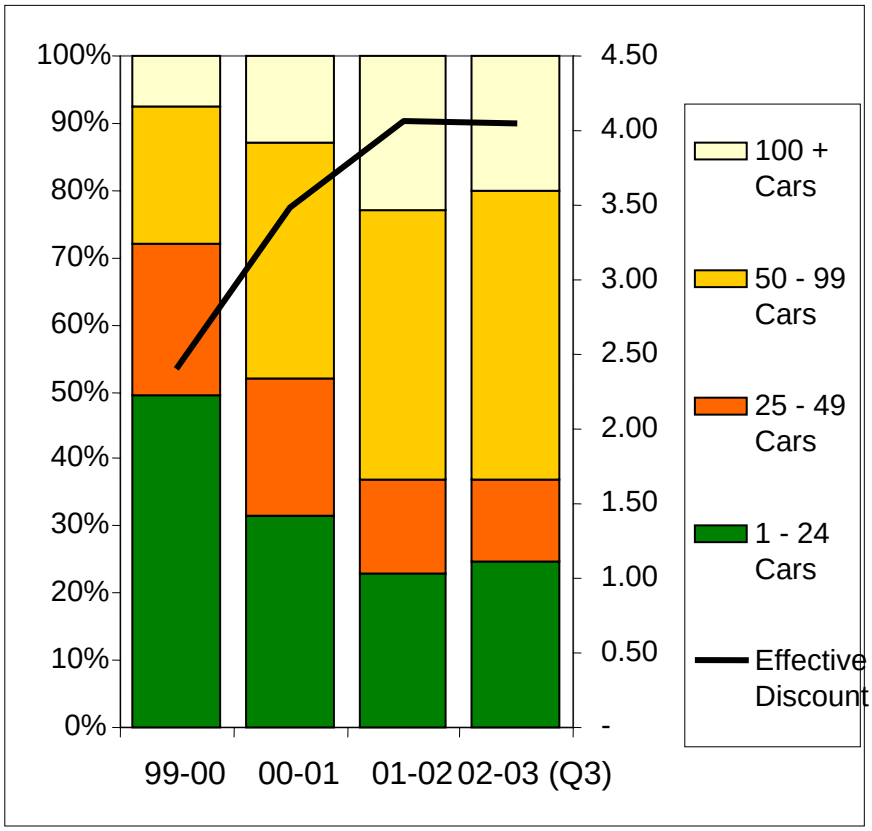
7. The Country Elevator Network

A far more significant change in the GHTS infrastructure is found in the changes in the country elevator network. The number of delivery points is now almost one third what it was in 1994, and the number of elevators has declined to less than 500 from 1,331 in 1994. However, while the number of delivery points and elevators has fallen by 61% and 62 %, respectively, the storage capacity of the network has fallen only 8%, a relationship indicative of the industry's shift to high throughput (HTP) elevators.

The changes in the origin network for the western Canadian railways has meant significant changes in the operational practices necessary to move the grain. Most predominant is the use of multi-car block incentives. As indicated in Figure 5, the percentage of 1-25 car block movements has been reduced by half, and the number of movements 50 cars and greater has doubled. The line shown in the graph indicates the average incentive rate paid over the past four years, which has moved from $2.41 per tonne in 1999 to $4.05 per tonne this past crop year.

Two other areas the two class one railways made significant strides in were in the creation of an entire short line industry and a renewed focus on asset utilization.

Figure 5. Railways' Car Block Sizes in Western Canadian Grain System



Source: Quorum Corporation

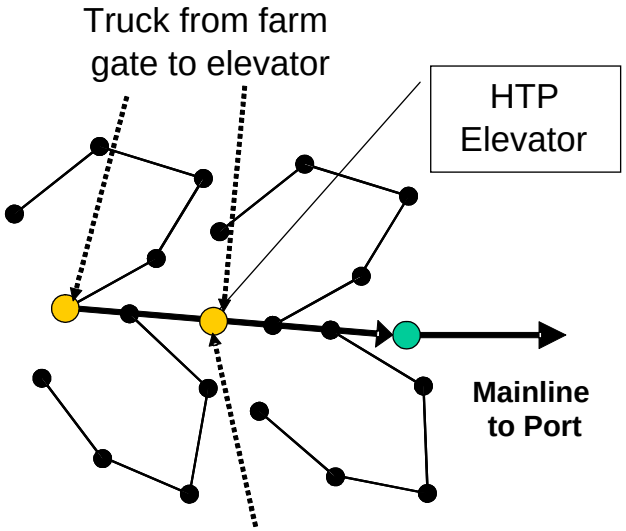
8. Current Operational Method

Railways continue to operate the branch line train runs, but place a greater focus on the service provided to the HTP facilities. With the number of conventional elevators reduced, and a greater focus on higher capacity facilities, many of which are located on secondary or main lines, the number of grain runs has been reduced. The attendant cost advantages include better utilization of equipment (both cars and locomotives), as well as a reduction in the manpower required.

The changes that have occurred see more and more 50-100 car movements. To illustrate the efficiencies gained, putting together a 100-110 car train requires only 1- 3 stops with little to no switching. This is in contrast to the grain runs of the 1970s and 1980s that required 30 plus stops and hours of switching and blocking before a train could leave a hub location (Figure 6 versus Figure 2).

Figure 6. Current Operational Method

- 50-100 car trains to HTP elevators
- Train runs direct to port with 1-3 blocks as lifted from HTP
- Requires fewer "Grain runs"
- Increases speed in car cycles
- Reduced cost of train operations



Source: Quorum Corporation

9. Impact of Railway Changes

The railways' lower costs did not come to them free. The railways share their benefits through incentive rates paid on multiple car blocks, with the level of incentive tied to the size of the block. While Canadian National Railway and Canadian Pacific Railway have slightly differing rate structures, they have followed the same path since the introduction of variable rates back in 1988. Starting with an incentive at 18 cars, they have moved them up to 100-110 car blocks today. In 1988, there might have been two or three facilities capable of loading a full train, while today there are 66 such facilities.

It is important to point out that the changes to the GHTS landscape have impacted producers, in that many now incur increased truck haul lengths to deliver their grain. Grain companies have also been placed in the position of paying trucking premiums to producers in order to attract grain to their facilities. It should be mentioned that grain companies provide other incentives to producers, including grade promotions, credit terms, and discounts. And while these premiums assist in offsetting producers' additional costs, they won't always be enough.

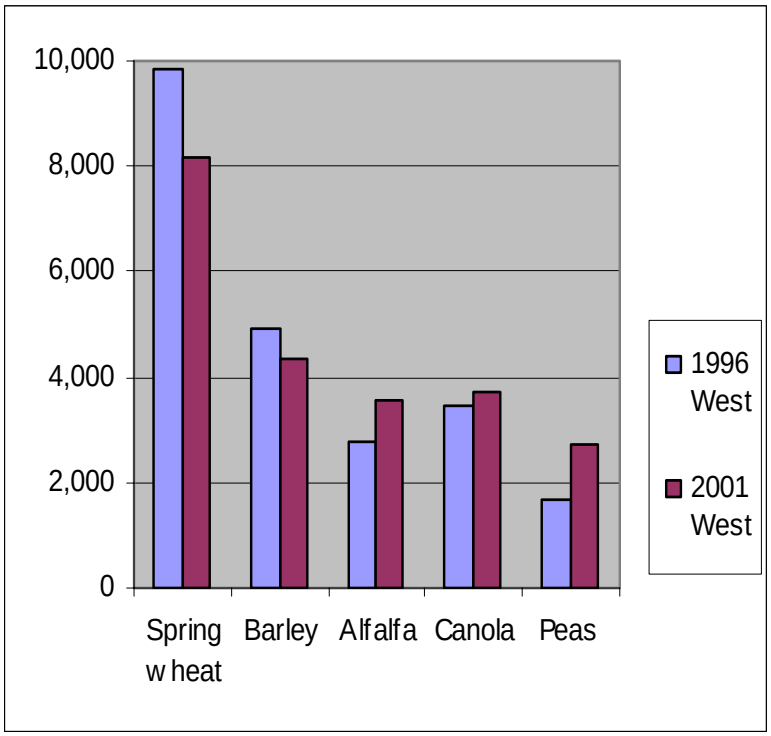
10. Changes in the Competitive Landscape

The competitive landscape has changed for all the stakeholders in the GHTS over the past 10 years. Grain companies have seen consolidation, new entrants into the system, and financial hurdles placed on the industry unlike any ever seen in recent history. This is compounded by the changes in the country elevator network—predominantly with respect to the capacity of the network, but also in terms of the changing dynamics, such as the delivery points and elevators.

While the country network has seen drastic changes, the port terminal network has seen relatively few, although through the consolidation in the industry we have seen ownership changes that will likely be the impetus for further change.

The changes in crop production that we have experienced on the prairies in recent years impacts the whole of the GHTS, not just railways. These changes have the potential to erode at, or, at the very least, significantly change the crop mix and, therefore, the requirements of the traffic base upon which the GHTS depends. As indicated in Figure 7, the export grains (spring wheat and barley) have seen reduction in land under seed while forage crops, such as alfalfa, are increasing, as are canola and peas.

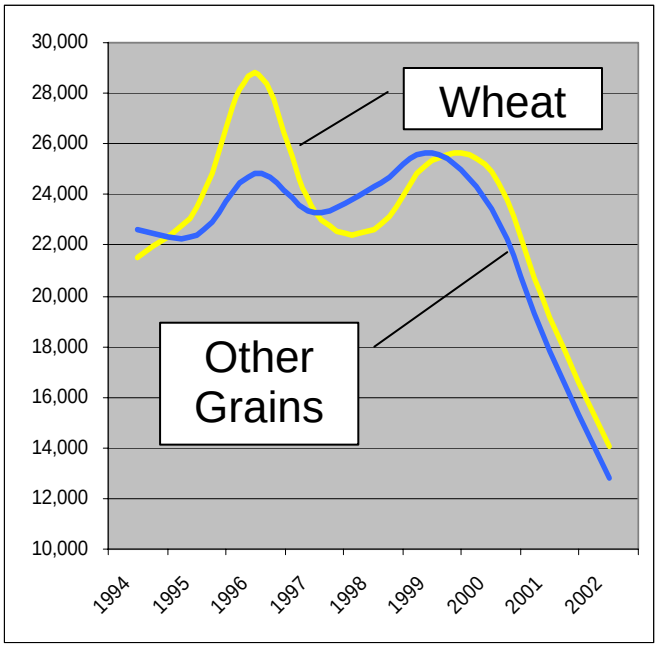
Figure 7. Hectares of Land Under Seed in Western Canada, 1996 and 2001 (000 hectares)



Source: Statistics Canada

Furthermore, as one who makes a living at measuring and monitoring the industry, I can't NOT mention the back-to-back droughts the industry has suffered, and point out the fact that production declines have impacted all stakeholders. From Figure 8, production of wheat and other grains over the last two years declined by almost 50% from the 10 year average. This has had an impact on all performance measures. The changes in the past two years should not be viewed as a trend, and as such, including these two years in any ongoing statistical assessment of trends and measures of the system efficiency is statistically wrong.

Figure 8. Tonnes of Wheat and Other Grains Produced in Western Canada, 1994 – 2002, (000 tonnes)



Source: Statistics Canada

11. Summary

To summarize, I would start by asking the question "What has been the primary driver of this drastic change?" Some will argue that the industry would not have changed without the regulatory momentum, while others will say that competitive factors forced the government to make the regulatory changes. Even further, some would want to argue whether it was the grain companies or the railways that drove the changes. I would submit that the answer is ALL OF THE ABOVE! Any change in a market this large must be brought about by the market itself and the majority of the players.
I also emphasize that not all of the costs that have been driven out of the railways' operations have reverted directly to their bottom line. Rather, at least a portion of those benefits have been pushed back to other stakeholders through a number of means. Some examples include, incentives for multi-car blocks, the indexing of the maximum rate scale in the pre-2000 rate adjustments, and the revenue cap exercise in 1998-2000.

I would also reiterate a point we have made in our Monitoring reports and that is that we believe the revenue cap has had an impact in a number of ways:

- It has effectively pushed benefits back to producers through the roll back of the single car tariff in August of 2000—a benefit which continues to be enjoyed by producers.
- It has proven that some level of competition exists in the railway industry today by virtue of the fact that neither railway has met or exceeded the cap, and, in fact, has consistently remained about 5% lower.
- It is also important to note that while railways have been given the latitude to price differentially, they have not—yet.

There, of course, remains unresolved issues for the industry insofar as the railway network's part is concerned:

- Bill C-26 remains on the table as it sits in committee and continues to be debated.
- Running rights is an issue that won't go away. In many of the stakeholder's eyes, the option of running rights continues to offer a solution that should be open for use.
- The Government hopper fleet and the question of what to do with this fleet.

12. Closing Comments

The theme of the conference is to point out the good, the bad and the unexpected, so I will close with some comments on the subject of trade-offs and the grain supply chain. One of the most predominant trade-offs has been the extended length of hauls by producers, which is the combined outcome of railway line abandonments, and reduced elevators and delivery points. This is not to point a finger, but rather state the facts. While the industry has found the absolute number of miles by which trucking has increased elusive, we all intuitively know that when you reduce the number of delivery points, the producer will have to drive further to deliver their grain. Alternatively, the CTA revenue cap data, as published in our Monitoring report, states that between 1999 and the end of the 2001/2002 crop year, the railways' average length of haul has decreased 7.3%, or 71 miles. If the producer is compensating for this entire amount, the math can get scary—not to mention his trucking bills.

The supply chain view of the system predicates that all stakeholders will give and take, and the potential for one to sub-optimize another is extremely high and creates a risk. ***That is bad.***

It is from this perspective that we ask the question of whether the GHTS, as a whole, has seen an overall reduction in the cost of grain movement. Within the Monitoring Program, we measure this through the producer netback, which answers a part of this question through the export basis—the total logistics cost of grain movement for the producer. An example is the export basis for Red Spring Wheat, which has, on average, decreased over the first three years of the Grain Monitoring Program, from $54.58 to $50.39/ tonne. There is a significant caveat with this, however, that rolls back to the issue of producers' length of haul—a number that no one really knows. So we estimated it at 40 miles—

which is wrong, but no one can prove us wrong. Over the next 12 months we will be working hard at fixing that, and I hope by this time next year I will be able to say with confidence what the length of haul is and why.

Another measure we look at is the speed at which product flows through the system. I won't belabour this point, but in the 1999/2000 crop year it was taking 69.9 days on average to move grain from the country position to loading on a vessel. We made some headway in this regard, up until last year when the time had been reduced to 67.7 days. But think about it, the average price on a tonne of wheat runs around $200. At prime, that works out to be about 3.2 cents per day, just for the cost of money. And we move over 25 million tonnes a year on average—which works out to about $800,000 per day. ***This is bad.***

Insofar as the ***unexpected*** – back-to-back droughts and the changes in production mix have impacted the service required of railways and other stakeholders.

The theme of this conference implies, in a way, that change in the industry comes through the regulatory process. I believe that industry change has and will come from the industry itself, and that the regulatory processes should support that change. ***And that is good***. And I know this will sound cliché, but the real answer to solving the issues facing this industry lie in the stakeholders in the industry viewing themselves as partners in the supply chain, and recognizing that the real benefit comes through working together in a collaborative approach. There is still a way to go in this regard.

Quorum Corporation

Grain Handling and Transportation Changes- Rail Services and Infrastructure

University of Manitoba Conference on: The Agricultural Industry After Western Grain Transportation Reform

Presentation by Mark Hemmes, President, Quorum Corporation

Winnipeg, MB

October 24, 2003

Topics

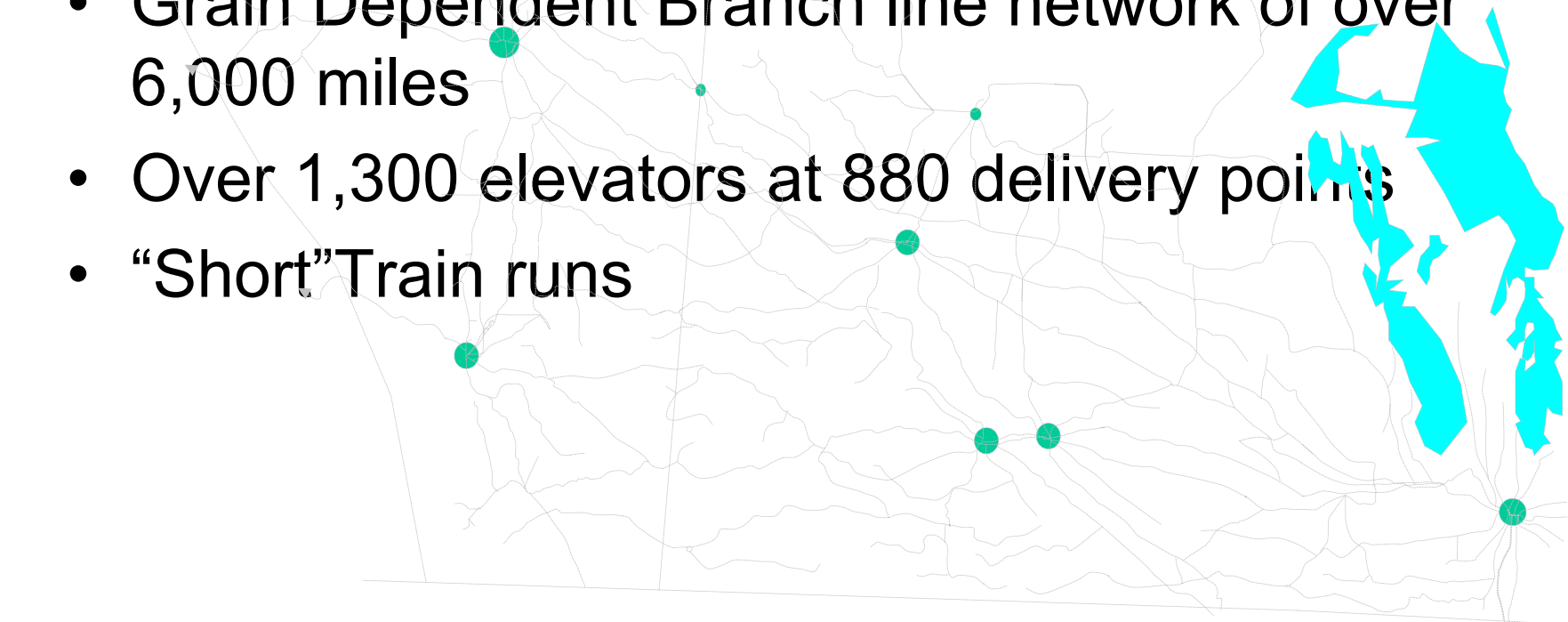
- Grain Monitoring … Who we are and what we do …
- Changes in the Railway Landscape
- What has driven the changes
- Some of the outcomes
- Summary

Preface - Grain Monitoring

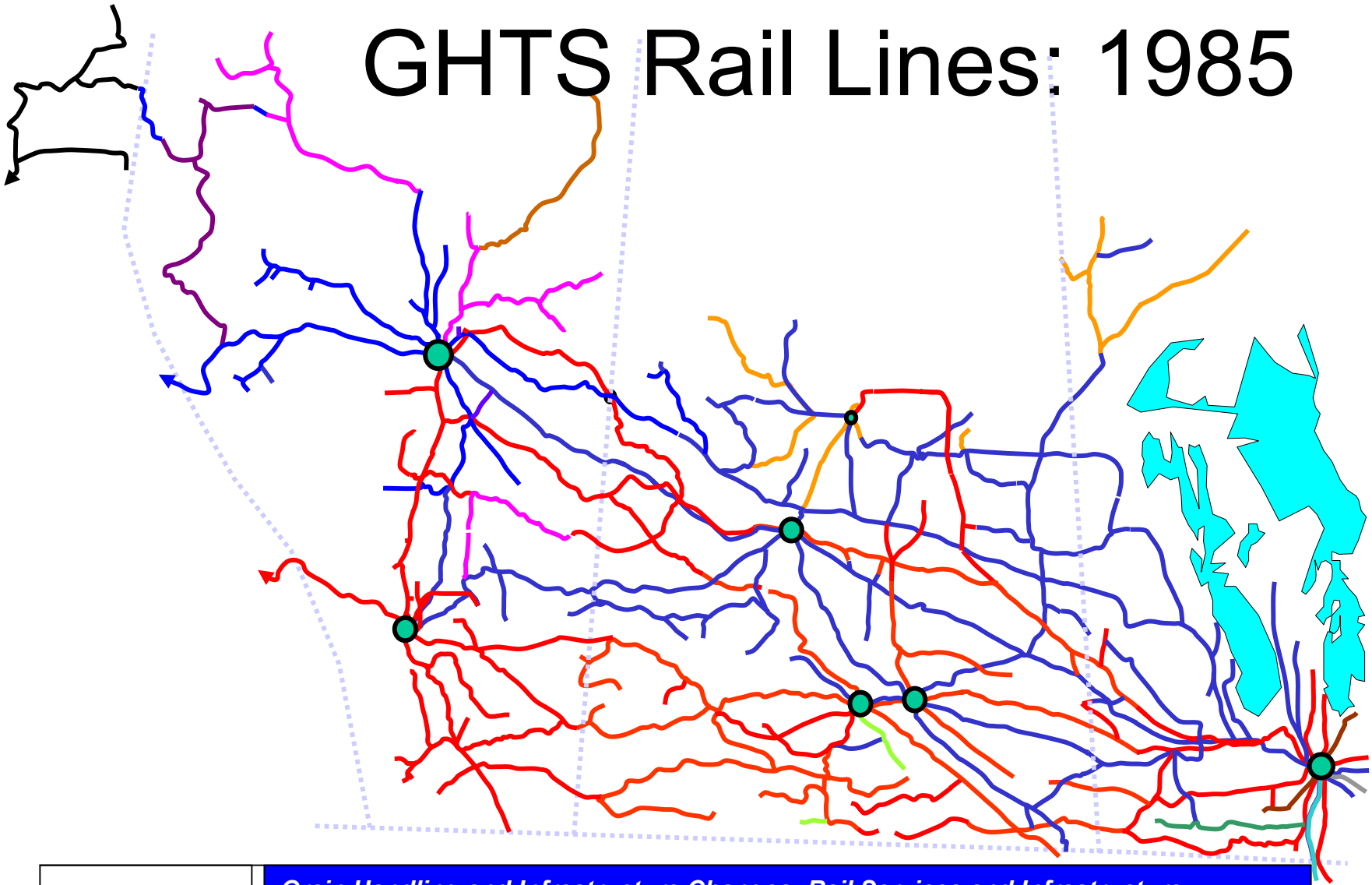
- Started June 2001 as a policy reform coming out of Estey – Kroeger
  - Gather data on all aspects of the movement of grain in Western Canada in order to develop measures and assess the performance of the system – both short and long term
- Have published 2 annual, 5 quarterly and 6 supplemental reports
- Annual Report for 2002-03 and Producer Netback Calculator Website currently in development
- Quorum has been given a two year extension of its contract services to continue the monitoring program

Railroading in the “Pre-1995” Western GHTS

- Almost 21,000 miles of track (1985)
- Grain Dependent Branch line network of over 6,000 miles
- Over 1,300 elevators at 880 delivery points
- “Short”Train runs



GHTS Rail Lines: 1985



“Pre-reform” Railway Operations

- Widespread Hub and Spoke car distribution system
- Train run programming and Car Allocation as determined through the GTA, CWB and Railways
- Three person crew way-freight “peddling” operations
- Accommodated the infrastructure in place in Country Elevator network

“Old” Operational Method

- Empties to Marshalling Yard
- Grain Runs to Branch lines
  - **Deliver 1-25 cars per spot**
- Gather loads 1-5 days later
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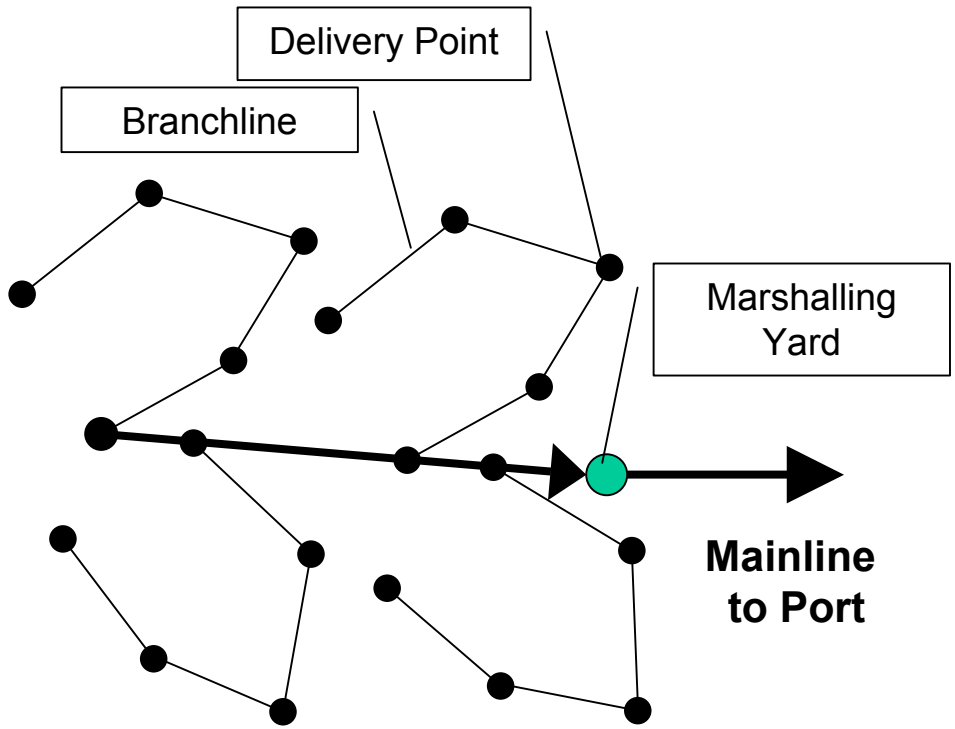
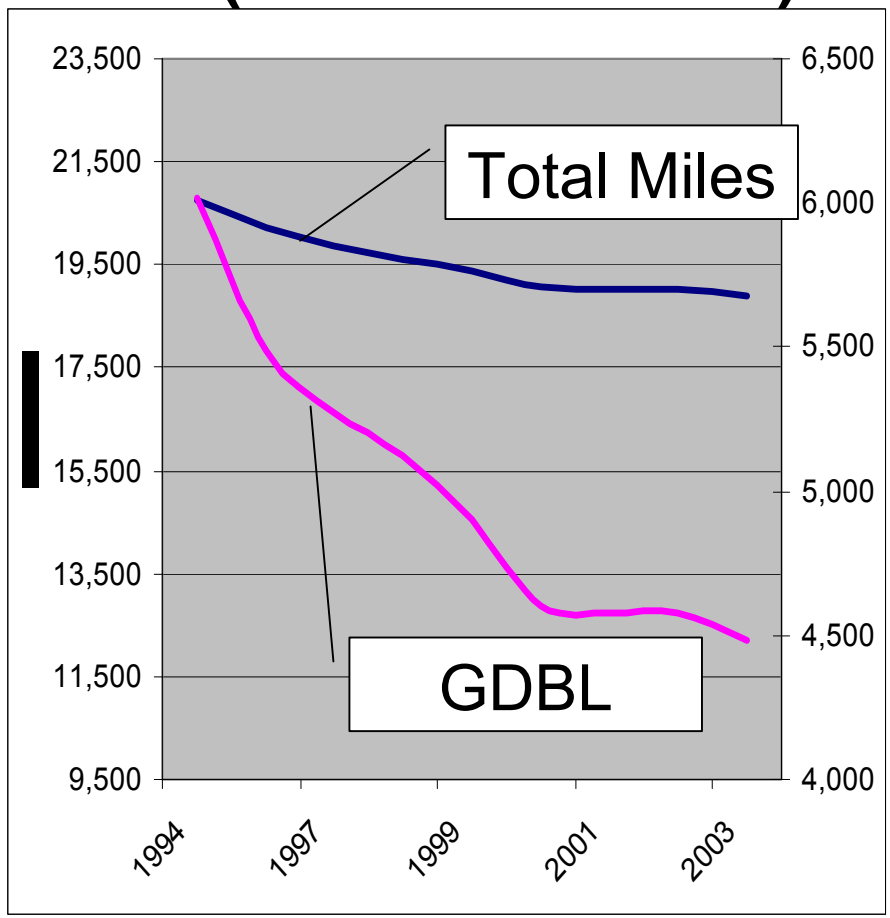


The Drivers of Change

- Regulatory Reform
- Changes in the Country Elevator Network
- Changes in Railway approach to marketplace and operation
- Increased competitive factors

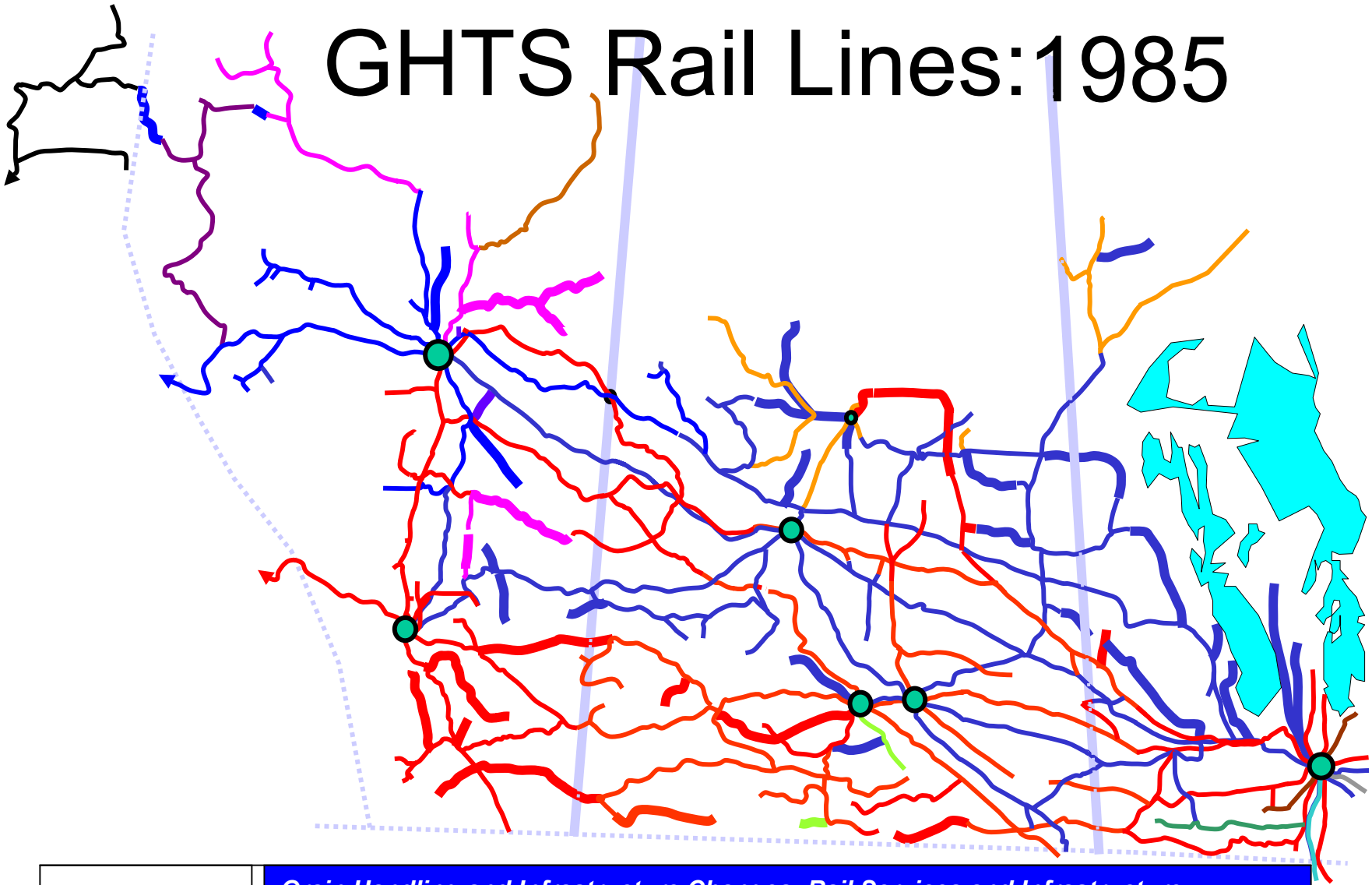
GHTS Rail Network (1994-2003)

- Total Miles down 9% - from 20,758 in 1994 to 18,908 in 2003
- GDBL down 25.5% from 6,018 to 4,481

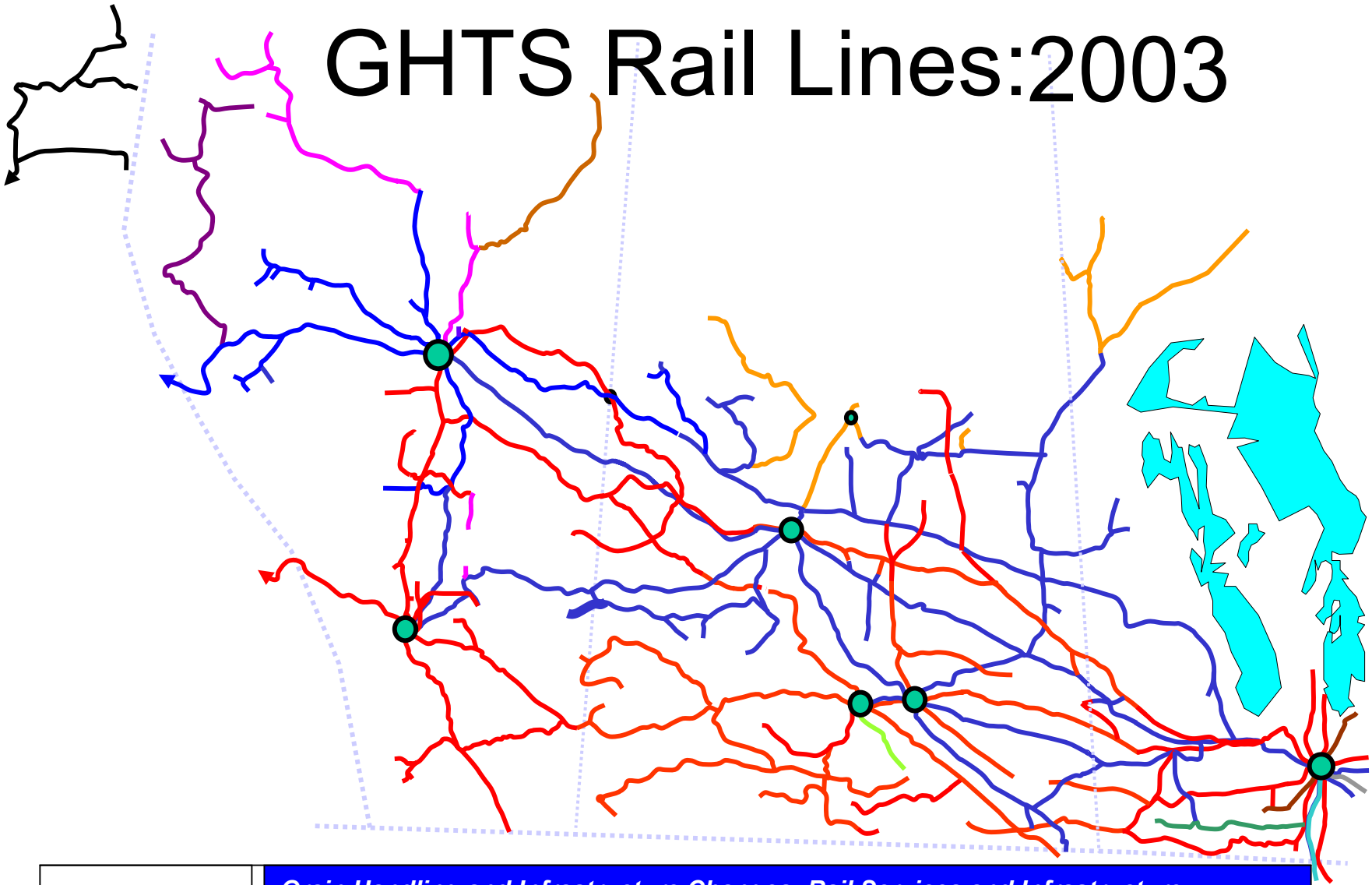


Miles in the Western Rail Network, 1994-2003

GHTS Rail Lines:1985



GHTS Rail Lines:2003



Western Grain Transportation Act

- Replaced the Crow Rate with a Statutory Rail Freight Rate set by the NTA/ CTA
- Created Grain Transportation Agency (GTA) in 1984
  - High level allocation of cars - Board and non-board "splits" (now done by railways)
  - Established volume projections used for setting of rates (was done by CTA)
  - Unload Targets and Performance Measures (GTA administered)

Genesis of Regulatory Reform

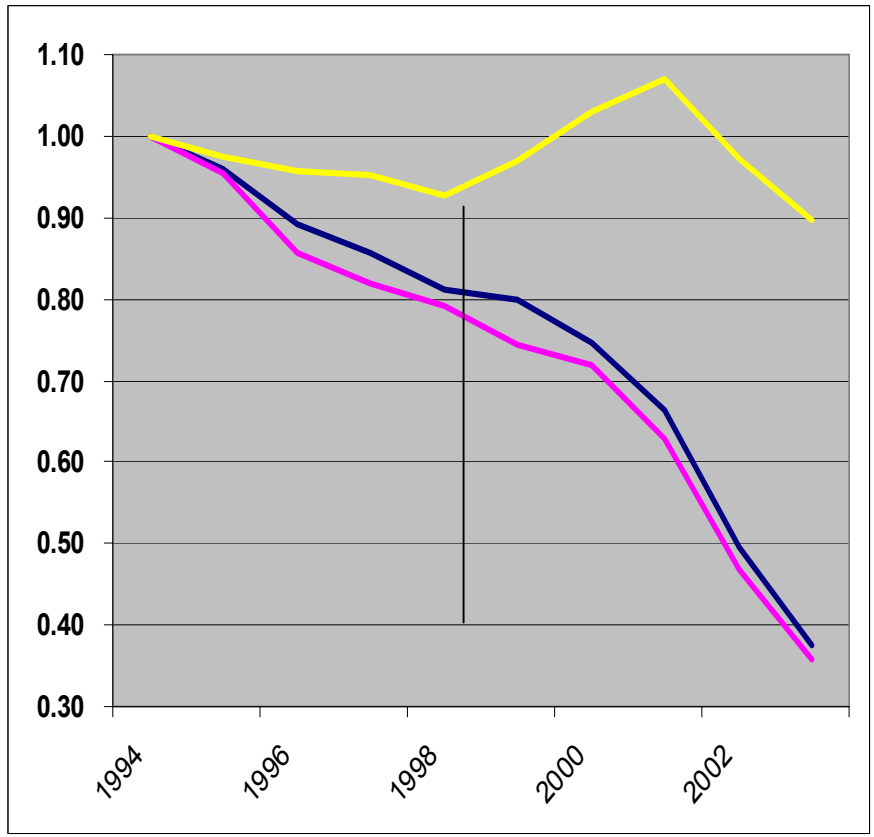
- Started with the repeal of the Crow (1982-83)
- Prairie Branch line Rehabilitation Program (1980's)
- Introduction of variable rates (1988)
- Elimination of Costing Review (last 1992)

Genesis of Regulatory Reform (cont.)

- Relaxing of abandonment approval process (1996)
- The Revenue Cap replaced the maximum rate scale (2000)
- Continued enhancements of Shipper Protection Provisions

The Country Network (1994-02)

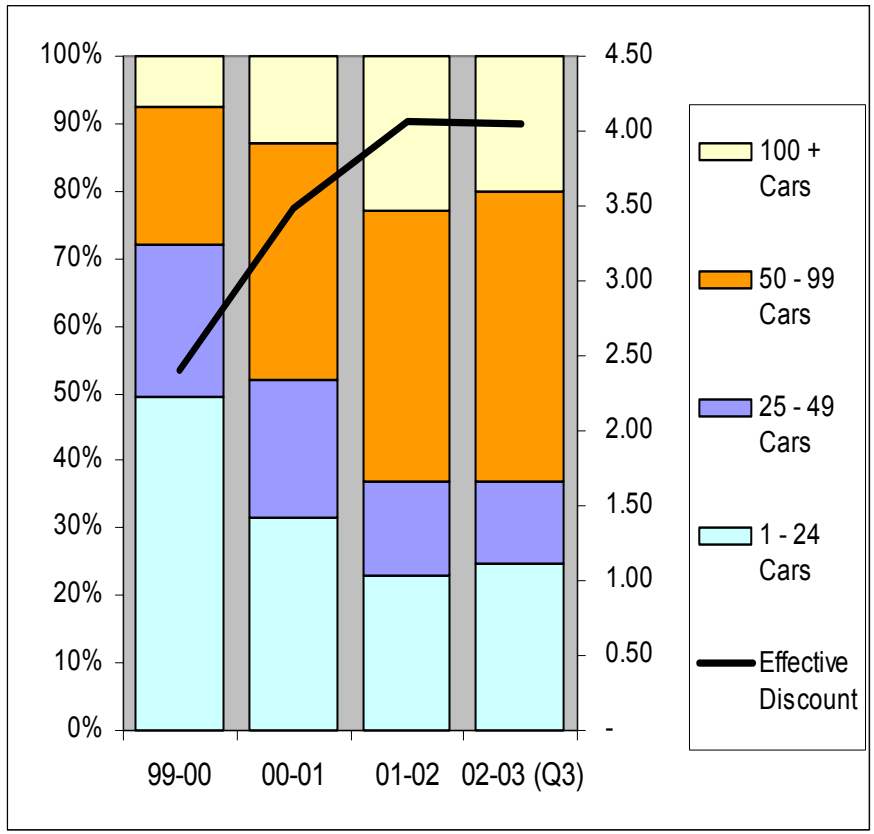
- Delivery Points reduced 60.9% from 880 to 344
- Elevators down 62.5% from 1331 to 499
- Storage Capacity down 8 % from 6,573 to 6,044 M Tonnes
- Grain Companies capital programs directed at HTP facilities



GHTS Country Elevator Network (Indexed)

Changes to Railway Approach

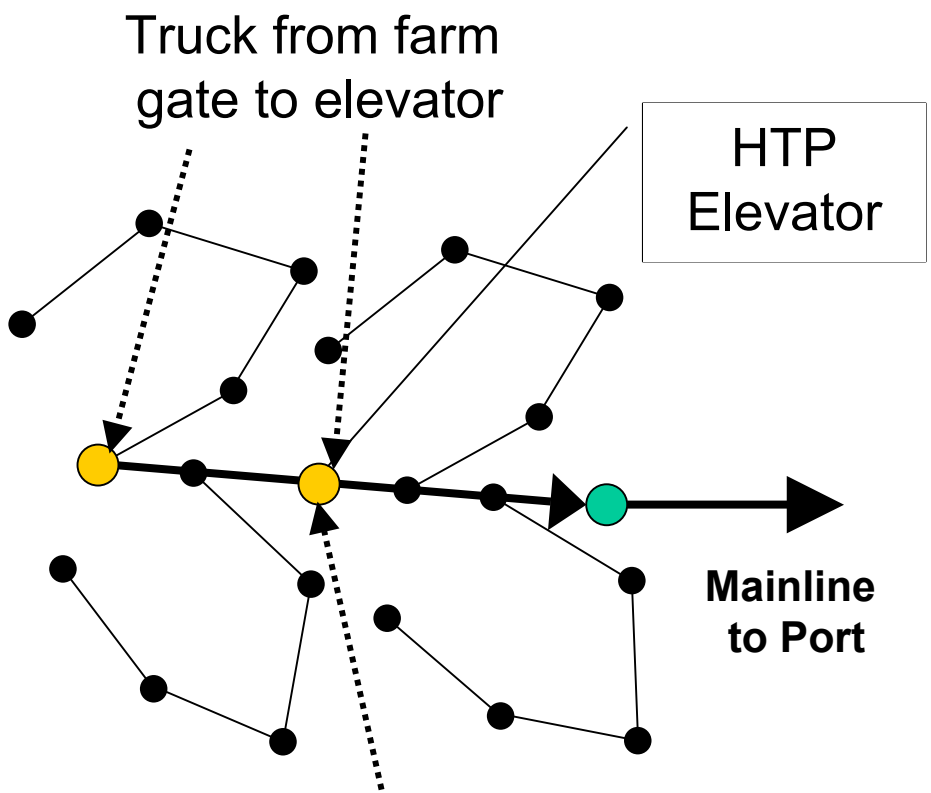
- Multi-Car Block Incentives
- Large Block/ Unit Train movements
- Shortline creation
- Focus on asset utilization



Car Block sizes in WC GHTS

Current Operational Method

- 50-100 car trains to HTP elevators
- Train runs direct to port with 1-3 blocks as lifted from HTP
- Requires fewer “Grain runs”
- Increases speed in car cycles
- Reduced cost of train operations



Impact of Railway Changes

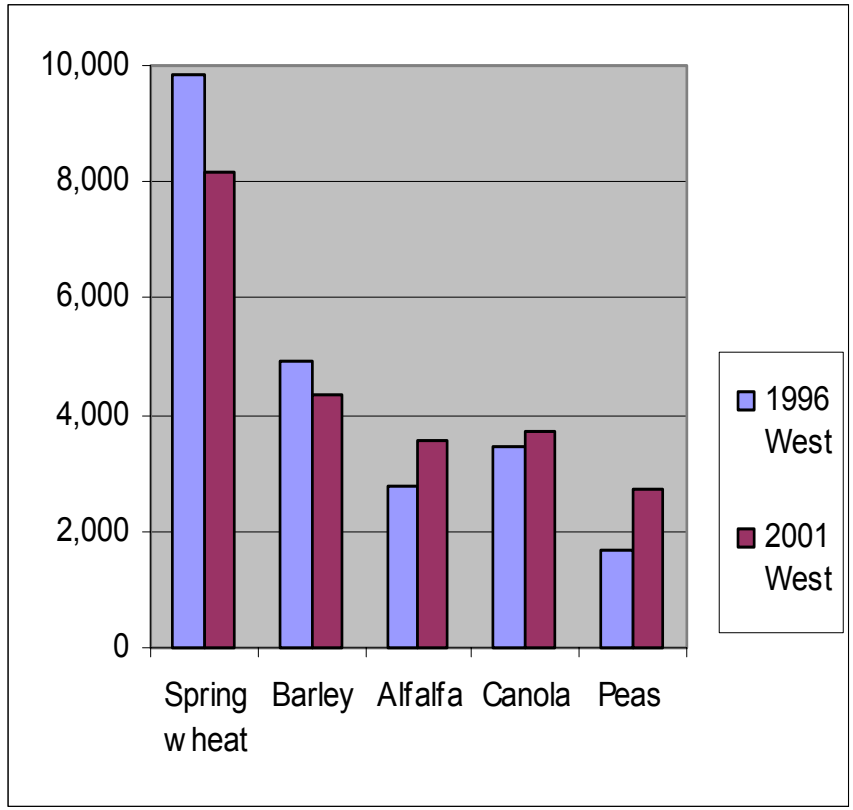
- Reduced Operating Costs through:
  - Fewer train miles, Lower staff costs
  - Reduced line maintenance, taxes etc.
  - Better asset utilization
- Benefits shared with Grain companies through MCB incentives
- Impact of longer length of truck haul for producer
  - Trucking Premiums from Grain companies to Producers
  - Tool Box items

Changes in Competitive Landscape

- Grain Companies
  - Consolidation
  - New entrants
  - Financial hurdles
- Amount of capacity in the country elevator network
- Capacity at the Terminals
- Changes in mix of crops
- Impact of Drought

Crop Diversity

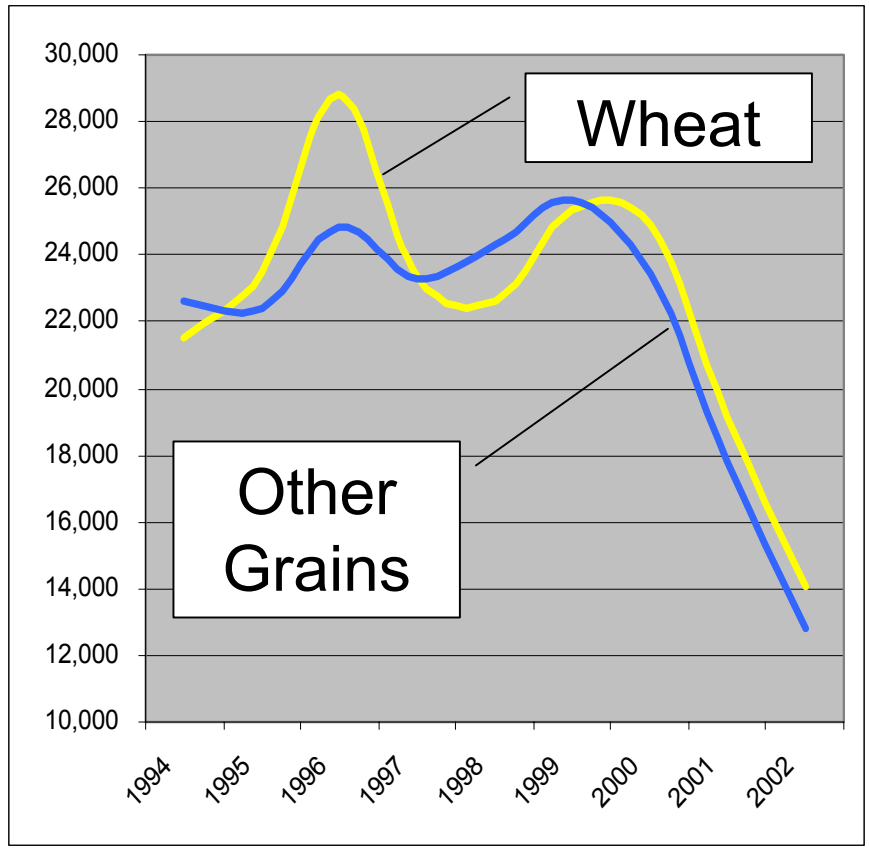
- Shifting growth patterns have effected railway potential volumes
  - Wheat / Barley under seed decreased 1996 to 2001
  - Alfalfa/ Canola increased
  - Peas/ Special Crops



Hectares of land under seed

Effect of the Drought

- Production down to almost half of the ten year average
- Impact on all performance measures
- Impacts the ability to gain economies of scale
- The change in the past two years SHOULD NOT be viewed as a trend



Tonnes produced, 1994-2002

Summary … Good ? Bad? Unexpected?

- Primary Drivers of Change ?
  - Regulatory change vs. Competitive factors…
  - Grain Company initiated vs. Railway initiated…
- Costs driven out of the operation by the changes were at least partially shared with the industry:
  - MCB Incentives
  - Pre 2000 through indexing of the Max rates
  - Post 2000 through the Revenue cap

Summary (cont.)

- Some unresolved issues remain …
- Trade offs
  - Changes in network has resulted in an increase in truck hauls with the cost assumed by the producer
  - *Supply Chain view* – Has the GHTS as a whole seen an overall reduction in the cost of grain movement?