Growing a Bigger, Better Pie: A Value-Chain Approach

December 2, 2009

Presented by:
Transport Institute
WESTAC

CONFERENCE SPONSORS:
Manitoba Infrastructure and Transportation
Aikins, MacAulay & Thorvaldson LLP
Growing a Bigger, Better Pie: A Value-Chain Approach

Delta Winnipeg, Manitoba
Wednesday, December 2, 2009

8:00 am – 8:25 am  Registration and Continental Breakfast

Morning Chairperson  Dr. Barry Prentice, Professor, Transport Institute

Session 1  
Value-chains in Theory and Practice
Value is added as products are transformed from raw material production to finished goods. Specialized supply chain intermediaries provide place (transport), time (storage), form (processing) and possession (transactions) utilities. The more efficiently these services are provided, the more competitive the value chain and the greater the net value-added. Win-win opportunities to gain efficiency in the value-chain may depend on collaborative efforts of two or more intermediaries. The first session provides an overview of value-chain concepts and practices, and challenges including supply chain coordination and leadership.

8:30 am – 9:00 am  Dr. Paul Larson, CN Professor and Director, Transport Institute, I.H. Asper School of Business “Overview of Value-chain Concepts and Practice”

Session 2  
Win-Win Inventory Strategies in Agri-Food Value-chains
Inventories add time utility by holding products during periods of low demand and providing them during periods of higher demand. Inventory holding costs involve capital for financing, storage infrastructure and materials handling, labour for managing and operating the equipment, and shrinkage and loss during storage. For grain, most of the long term storage of grain is provided by farmers, while grain handling system stores the pipeline inventories. The cost of farm versus commercial storage means that the less time inventories can be held in the pipeline, the more value is created. This session considers the value added by farms and the grain handling system.

9:00 am – 10:30 am  
Mark Hemmes, President, Quorum Corporation “Western Canadian Grain Handling Value added“
Ted Eastley, Executive Director, Manitoba Rural Adaptation Council (MRAC) “Where’s the Money?”

Roundtable discussion

10:30 am – 11:00 am  Networking Break
**Win-Win Transport Strategies in Agri-Food Value-chains**

Place utility is added by transporting goods from locations with lower demand to places with higher demand. Transshipment of goods is often necessary to reach the final destination. In some cases transshipment can lower total costs, but handling goods per se does not add value, and can in fact reduce value. This is why the coordination of the different components of a transportation network is so important. This session considers the transport of bulk and containerized rail shipments and port transshipment.

**11:00 am – 12:00 am**

Mark Griggs, Acting Director of Planning and Development, Port Metro Vancouver

"Building for today, and for a Growing Future"

Murray Hamilton, Director of Grain, Canadian Pacific Railway “Rail Bulk Transport Value Added”

**Roundtable discussion**

**Inland Ports and Value-chains**

Global trade and the renaissance of the rail industry in North America are creating opportunities for new value-added gateway locations. Leading this trend is the establishment of inland ports and foreign trade zones. Value-added gateways help Canadian companies exploit opportunities such as intermodal transportation, transhipping, warehousing, logistics information and communications, finance and skills development. Changes proposed by the Government of Canada in the 2009 Budget will bring tariff and treatment of international marine containers more in line with U.S. regulations. In Manitoba, The CentrePort Canada Act (2008) is establishing an inland port at Winnipeg to take advantage of its location at the geographic centre of North America.

Alberto Velasco-Acosta, Executive Director, International Business Development & Investment, CentrePort Canada “Lunch Keynote Speaker”

**Afternoon Chairperson**

Ruth Sol, President, WESTAC

**Session 4**

**Win-Win Information Strategies in Agri-Food Value-chains**

Transactions costs involved with buying and selling of goods can be reduced by better information. Also, information can add value. Grain that is labeled and separated could have more value than the same product that is blended with other grain that has slightly different attributes. The preservation of identity requires physical separation and information tracking. Another value added by information is inventory visibility. Companies can minimize safety stocks, while providing the same level of customer service if their inventory stocks are visible. This session explores the role of information in the grain value chains.

**1:30 pm – 3:00 pm**

John Graham, Services Executive, IBM Canada Ltd. “Information Management and Value Added Internet Trading”

Curtis Rempel, Research Development Manager, Richardson Centre for Functional Foods and Nutraceuticals “Opportunities to Preserve the Value of Biotech Traits”

Dwayne Lee, Marketing Manager, USA, Canadian Wheat Board “Wheat Value-chains”
Roundtable Discussion

3:00 pm – 3:30 pm       Networking Break

Session 5

Panel Discussion: Growing the Bigger Pie - *Win-Win Value-chain Strategies*
How will the future of agriculture in Western Canada be different than it is today? Where can efficiencies be gained, and waste (muda) be eliminated? How can more value be added to traditional grain supply chains or new value chains created? Who are the value chain leaders and how is leadership expressed? The panel is asked to consider these questions and to comment on their sense of future directions.

3:30 pm – 4:15 pm       Panel Chair:

**Dr. Paul Earl**, Assistant Professor, Dept. of Supply Chain Management, I.H. Asper School of Business

Panel Members:

**Mark Hemmes**, President, Quorum Corporation

**Brent van Koughnet**, Port Metro Vancouver

**Curtis Rempel**, Research Development Manager, Richardson Centre for Functional Foods and Nutraceuticals

**Dwayne Lee**, Marketing Manager, USA, Canadian Wheat Board

Roundtable Discussion

4:15 pm – 4:30 pm       *Rapporteur*
The examination of agri-food value chains has a diversity of issues that is likely to produce a number of interesting themes. The Rapporteur will provide a synthesis of what we heard, and perhaps what we did not hear, too.

**Dr. Ed Tyrchniewicz**, Senior Scholar, University of Manitoba

4:30 pm       *Closing Remarks*
Overview of value-chain concepts & practice

Paul D. Larson, Ph.D., P.Log.
CN Professor of SCM
Director, Transport Institute

14th Annual Fields on Wheels

Winnipeg, Manitoba
December 2, 2009
Mission

To facilitate prosperity, sustainability, and mobility.
Comprehensive Sustainability

Environment

Society

Economy

Community livability

Socio-economic equity

Sustainable practices

Centre for Sustainable Transportation, Definition and Vision of Sustainable Transportation, October 2002.
Figure 1: Number of hungry people in the world (in millions)
In 2006, 35.5 million Americans lived in food insecure households; 22.8 mil. adults, 12.6 mil. children.

April 1, 2008: Canadian population estimated at 33,223,840 people by Statistics Canada (www.statcan.ca).
1. DONATIONS ARE MADE
America’s Second Harvest—The Nation’s Food Bank Network gets food and financial donations from individuals and companies across the country.

2. FOOD IS MOVED
The America’s Second Harvest Network has more than 200 member food banks and food rescue organizations nationwide that distribute food to local charitable agencies.

3. FOOD IS DISTRIBUTED AND STORED
Every year, America’s Second Harvest Network food banks and food rescue organizations provide food to more than 50,000 local agencies.

4. FOOD REACHES THOSE IN NEED
The local agencies give food to hungry people through more than 94,000 programs.

5. FOOD REACHES THOSE IN NEED
More than 25 million Americans receive a meal through the America’s Second Harvest Network annually.
Figure 5  Food Bank Use as Percent of Population: 1997, 2006, 2007

HungerCount 2007, Canadian Association of Food Banks, Toronto.
“So, what is SCM?”

SCM is the process of strategically managing flows of goods, services and information, along with relationships within and among organizations, to deliver greater economic and/or social value and customer service.

It involves the interaction of logistics, operations, purchasing and elements of other functional areas like marketing and MIS, and it focuses on serving relevant stakeholders (customers, suppliers, shareholders, employees, communities, policy makers).
What is a supply chain?

“A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request. Within each organization, the supply chain includes all functions involved in receiving and filling a customer request.” (Chopra and Meindl 2004)

Parties: farms, processors, transporters, warehouses, grocers, restaurants

Functions: new product development, processing, transportation, warehousing, marketing, purchasing, communication, finance, etc.
# Utilities and Functions

<table>
<thead>
<tr>
<th>Utility</th>
<th>Function</th>
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<tbody>
<tr>
<td>Form</td>
<td>Processing</td>
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<tr>
<td>Place</td>
<td>Transportation</td>
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<tr>
<td>Time</td>
<td>Warehousing</td>
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<tr>
<td>Possession</td>
<td>Transaction</td>
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<tr>
<td>Information</td>
<td>Communication</td>
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</table>
Wheat Supply Chain

Farm

- Elevator
  - Accumulate & combine production
  - Warehousing

- Miller
  - Processing: grinding and sifting wheat into flour

- Baker
  - Transportation
  - Transaction

CWB

Consumer

USDA

World Trade Organization
From Barley to Beer

**Malting**
- **Malting Barley**: Barley is a cereal grain used in the production of malt. Barley is grown in Canada and is harvested and malted.
- **Steep Tank**: Malt and barley are added to the tank. The barley malted is milled to produce malt grains.
- **Barley Kernel**: In the kilning process, the endosperm of the kernel is converted into malt. The endosperm and aleurone layer are removed to create malt.
- **Kilning**: The kilning process is used to develop the desired color and flavor of the malt.
- **Malt**: The malted grain is ground into a fine powder called malt.

**Brewing**
- **Milled Malt**: The milled malt is sent to the mash tun.
- **Mash Tun**: Malt and hot water are mixed in the mash tun to create a brew.
- **Lauter Tun**: This tun separates the wort from the spent grains. The wort is then boiled with hops to create beer.
- **Brew Kettle**: The brew is boiled for a specific time to create beer.
- **Fermentation**: Yeast is added to the wort to convert it into alcohol.
- **Storage & Filtration**: The beer is stored in a tank to age and settle.
- **End Product**: The final product is beer, ready for serving.
Figure 1. A Comparison of a Value Chain with a Supply Chain

Lean Value Chain and Production System

Lean Supply Chain
- Lean Operations
- Outbound Logistics
- Marketing & Sales
- Customer Intimacy

Lean Product Design
- Supplier Partnership

Lean Product Development
- Improved quality
- Increased flexibility
- Increased speed
- Just-in-time

Waste Reduction

Employee Empowerment

Customer Service

Lean Manufacturing

Lean Selling

1000ventures.com
The value chain concept, while relatively new to the Canadian Agriculture and Agri-food sectors, is generating interest due to proven success around the world. By linking production, processing and marketing activities to market demands, value chains provide a unique way to manage risk. The partnerships a value chain creates mean the risks and rewards are shared up and down the chain. This sharing of information allows for a quick response to consumer needs while keeping the value of the product high.

Value Chains = Consumer Trends + Market Opportunity
A **value chain** is a business model based on collaboration. An agri-food value chain is a **partnership** between producers, processors and marketers created to improve quality, increase efficiencies or develop and market differentiated products to make all partners more profitable. Value chains allow members to be more competitive by seeking market opportunities and linking production and processing requirements to meet consumer demand.

http://www.valuechainmb.ca/
A value chain is a market-focused collaboration among businesses working together to achieve a more rewarding position in the market. A value chain benefits producers, processors & marketers by responding to market demands, aligning product development, processing & logistics in an effective & efficient manner.

http://www.agcouncil.ca/valuechains.htm
A value chain occurs when companies need to collaborate to improve quality, increase systems efficiencies, or develop differentiated products to achieve a more rewarding position in the market place.

http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/agp11922
# Value Chain vs. Traditional Business Approach

<table>
<thead>
<tr>
<th></th>
<th>Value Chain</th>
<th>Traditional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Extensive</td>
<td>Little or none</td>
</tr>
<tr>
<td>Value Focus ((V = Q/P))</td>
<td>Value/Quality</td>
<td>Cost/Price</td>
</tr>
<tr>
<td>Product</td>
<td>Differentiated product</td>
<td>Commodity</td>
</tr>
<tr>
<td>System Driver</td>
<td>Production Push</td>
<td>Consumer Pull</td>
</tr>
<tr>
<td>Organizational Structure</td>
<td>Interdependent</td>
<td>Independent</td>
</tr>
<tr>
<td>Business Relationships</td>
<td>Collaborative</td>
<td>Adversarial</td>
</tr>
<tr>
<td>Source of Supply</td>
<td>Known &amp; Traceable</td>
<td>Anonymous</td>
</tr>
<tr>
<td>Source of Risk</td>
<td>Relationships</td>
<td>Market &amp; Price</td>
</tr>
</tbody>
</table>

http://www.valuechainmb.ca/
Push-Pull Boundary

Origin

- Push
- Speculate

Point of pre-positioning

- Pull
- Postpone

Destination
Partnership Characteristics

- High level of cooperation
- Costly to implement
  - Extra communication
  - Coordination
  - Risk sharing
  - IT infrastructure investment

Wendy’s Partnership Matrix

- **High Complexity to Wendy’s**
  - **Low Volume of the Buy**: Seek Partnerships
  - **High Volume of the Buy**: Seek Partnerships

- **Low Complexity to Wendy’s**
  - **Low Volume of the Buy**: Seek Partnerships
  - **High Volume of the Buy**: Seek Partnerships
Partnership Drivers

- Asset and cost efficiencies
- Customer service enhancements
- Marketing advantages
- Profit growth or stability

Partnership Facilitators

- Compatibility of corporate cultures
- Compatibility of philosophy and techniques
- Strong sense of mutuality
- Symmetry between the two parties

How a value chain can help your business:

- Increase efficiencies
- Reduce costs
- Consistency of supply
- Market differentiation
- Increase food traceability
- Knowledge and information sharing
- Reduce and share risk

http://www.valuechainmb.ca/
“A value chain is comprised of the series of events surrounding the development, production, and delivery of a good or service desired by targeted consumers.”

Gooch, Martin & Abdel Felfel (2009), *Characterizing the Ideal Model of Value Chain Management and Barriers to its Implementation*, Value Chain Management Centre.
Six (or 7) principles of VCM:

1. Focus on customers and consumers
2. Create, share, realize and protect value
3. Get the product right – every time
4. Ensure effective and efficient logistics
5. Ensure an effective information and communications strategy is in place
6. Build and maintain effective relationships
7. Add value—or get out of the way

Gooch, Martin & Abdel Felfel (2009)
**Fundamental Value Chain Questions**

1) Who are your customers?

2) What do your customers want?

3) What functions must be done to provide them value?

4) Who is going to perform these functions?

5) What should your supply chain relationships look like?

6) How will you share information in the supply chain?
Overview of value-chain concepts & practice

Paul D. Larson, Ph.D., P.Log.
CN Professor of SCM
Director, Transport Institute

14th Annual Fields on Wheels

Thank you!

Winnipeg, Manitoba
December 2, 2009
Fields on Wheels
Winnipeg
December 2, 2009

Changes in the Western Canadian GHTS and Challenges of the Value Added
Preamble: What we are working on ....

- The GMP looks in detail at market, infrastructure and operational changes in the GHTS – starting in 1999
- Questions raised over the past two years led to the conclusion that it is time to look at some aspects of the GHTS in detail in a longer view
  - We chose 30 years (?)
- We’ve just started
  - Some data is easy to find or develop – other data is not so easy
Agenda

- GHTS over the past 30 Years
- Summary of Changes
- Changes in the playing field
- Challenges Today and going forward
- Summary
Production – 28 Years (Tonnes)
Production – 28 Years (% Proportion)
Production – 28 Years (Trends)
Livestock Production (Head, 000)

- Calves
- Cattle
- Hogs
- Sheep & Lambs


Quorum Corporation
Production Change: Drivers

- GHTS Regulatory Changes
- Shift to Processing
- Desire for value added production and processing
- Producers desire to diversify income streams
Country Elevator Network

Capacity (Tonnes-, 000)

Down 35% ... to 65% of what was

Elevators

Down 89% ... or 11% of what was

Elevators  Capacity
Railway Infrastructure (Route Miles)

Down approximately 20%

* - Estimates

Route Miles

Grain Dependent
Distribution of Incentive Movement

- **1999-00**
  - 50 + Car Block: 30%
  - Less than 50 Car Block: 70%

- **2000-01**
  - 50 + Car Block: 30%
  - Less than 50 Car Block: 70%

- **2001-02**
  - 50 + Car Block: 30%
  - Less than 50 Car Block: 70%

- **2002-03**
  - 50 + Car Block: 30%
  - Less than 50 Car Block: 70%

- **2003-04**
  - 50 + Car Block: 30%
  - Less than 50 Car Block: 70%

- **2004-05**
  - 50 + Car Block: 30%
  - Less than 50 Car Block: 70%

- **2005-06**
  - 50 + Car Block: 30%
  - Less than 50 Car Block: 70%

- **2006-07**
  - 50 + Car Block: 30%
  - Less than 50 Car Block: 70%

- **2007-08**
  - 50 + Car Block: 30%
  - Less than 50 Car Block: 70%

Legend:
- **50 + Car Block**
- **Less than 50 Car Block**
Infrastructure Change: Drivers

- Regulatory Change
  - Robson lines etc.
  - NTA/CTA amendments

- Operational Changes
  - Driven by profit motivations
  - High TP elevators
  - Larger car blocks

- Shifts in production, processing, livestock?
Changes over the past 30 Years ....

- Production
- Infrastructure
- Market
- Operational
Current Challenges emerging ...
Changing Logistics Complexities

- **Country**
  - Producer
  - Truck
  - Country Elevator

- **Transit to Port**
  - Railway

- **Port**
  - Grain Terminal

- **Ocean Transit**
  - Bulk Ocean Vessel

- **Producer**
  - Truck
  - Processor
  - Container
  - Truck

- **Railway**
  - Container Terminal

- **Processor**
  - Truck

- **Transloader**
  - Container
  - Truck

- **Cont Ocean Vessel**
Inventory Management

- **Identity Preserved (IP) markets**
  - A process that allows for the creation of market differential for the commodity and hence increased commercial value
  - Protect integrity of product for market access purposes

- **IP Processes**
  - A process that requires structured process controls and management as well strictly managed physical segregation
    - Potentially greater requirements and demands on existing bulk capacity
    - Greater demands on management time and physical infrastructure
Inventory Management Challenges

- IP Grain movements
  - Impact on facility capacity?
- Increasing mix of bulk/ container movement
- Changing size of sales
- Demand of increasing importance of food security protocols
- *Does the current system have the capacity to handle this?*
- *Will the differential value account for increased operational and capital burden?*
What are some of the factors driving the change?

- Initiatives by shipping lines and railways to improve revenue yield and asset utilization
- Market push for smaller lot sizes (JIT etc)
- Managing sales delivery with available transportation capacity
- Arbitrage
  - Bulk vs. Container
  - Rail vs. Ocean
... the goal still?

- Access to transportation capacity
  - At a price that enables growth but allows all stakeholders to profit
  - With a level of consistency that allows all stakeholders the ability manage their assets (without sub-optimizing other stakeholders)
- A system of delivery with options that meet the needs of the industries export customers
  - Bulk, container, etc
Changes to watch for....

Market:
Segregation, IP, HACCP, Food Security

Infrastructure:
Capacity limitations

Production:
Continued shifts to Value added?

Operational:
Continued focus on asset utilization?
Summary

- The Challenges now:
  - Improving the reliability of the GHTS
  - Sustaining the optimal performance realized over the past 9 months
  - Managing the Changing complexities the global marketplace is placing on the GHTS
Summary

- While many seem to think that things don’t seem to change, the past ten years has seen improvement
  - The changing market demands and stakeholder goals have changed the playing field
- Shippers see rail service as the key to market access and therefore the limiting
- The grain industry echoes the broader industry’s sentiments: service consistency, available capacity, accountability, reliability
Growing a Bigger, Better Pie: A Value Chain Approach

“Where’s the Money”?

Ted Eastley, Executive Director
Manitoba Rural Adaptation Council
14th Annual Fields on Wheels Conference
December 2, 2009
About MRAC

- *Pathfinding Ag Solutions*

- Not for profit granting agency

- Funded by the federal government under Agriculture and Agri-Food Canada

- Objective is to advance the Manitoba agriculture sector
Funding Programs

MRAC administers two programs:

**CAAP** – Canadian Agricultural Adaptation Program

**NEISP** – New and Emerging Issues Speakers Program
CAAP Objective

To facilitate the agriculture, agri-food, and agri-based products sector’s ability to seize opportunities, to respond to new and emerging issues, and to pathfind and pilot solutions to new and ongoing issues in order to help it adapt and remain competitive.
Manitoba Rural Adaptation Council
Pathfinding ag solutions
• Logistics
  • Timeliness to market
  • Directness to market
  • Less handling
  • CentrePort Canada – development of on/farm or mini-ports handling?
    » North – South
    » East – West
    » Value added depot/industrial park
    » Point(s) of certification??
• Value
  • Value added processing (Made in Canada)
  • Industry attraction
  • Shipment of higher value commodity
• Traceability (Full Value Traceability)
  • establishing “one version of the truth” for customers, producers, suppliers and consumers (consumer confidence)
  • Moving from *defensive posture* (cost of doing business, “table stakes”, reactive crisis mgm’t → cost → lost market share) to a *pro-active management tool*
Thinking outside the box
• Management tool
  » Market differentiation
  » Price preservation
  » Market preservation
  » New/expanded market (oil content, gluten content, protein content, etc.)
  » Accountability - Due diligence → consumer confidence (“gate–to-plate”)
  » Parallel marketing opportunity
  » Agronomic practices
  » Handling/shipping practices
  » Incorporation of other statements/impacts (i.e. carbon footprint, etc.)
Yorkshire Carrots

Specially grown by:

John Smith of Coe House Farms has been growing carrots for 20 years on the light sandy soil at the Vale of York and the Vale of Pickering. These soil types and the water via the lime scale wolds provides the carrots with a smooth skin finish and a sweet taste.

- Rich in Vitamin A
- Best kept refrigerated
- Wash before use
• Summary

• Where’s the Money?

• Answer: Opportunity there to capture at each point of contact — *if you can trace the rightful owner* (of the money and the product)!
Questions?
Building for Today and a Growing future

Presentation to:
The 14th Annual Fields on Wheels
Mark Griggs
Acting Director Planning and Development
Port Metro Vancouver

December 2nd, 2009
Outline

- Introduction
- Port business
- Supply chain initiatives
  - Infrastructure developments
  - Measuring and monitoring
- Competition – advantages of the gateway
- Sustainability – environment, social and economic
Mission: Lead the efficient and effective movement of cargo and passengers in a manner that supports Canadian growth and prosperity now and in the future.

Port Metro Vancouver
Largest Port in Canada trading $75 billion in goods annually with more than 130 trading economies
In 2008 handled 115 million tonnes of cargo: largest Port in North America in Total Foreign Exports

portmetrovanouver.com
Three Continental Rail Links

http://www.canadaspacificgateway.ca/shared/images/pictures/supply_chain_lg.jpg
Business Sectors
Total Tonnage by Sector (2008)

(in millions of metric tonnes)

- Container, 20.46
- Auto, 0.46
- Breakbulk, 20.56
- Bulk, 73.08
Bulk Commodity Exports

- Coal: 36%
- Chemicals, Metals, and Minerals: 16%
- Potash: 9%
- Sulphur: 6%
- Grain: 15%
- Petroleum Products: 10%
- Forest Products: 6%
- Other: 2%
Supply Chain Strategy

- Goal: Develop the most reliable and consistent supply chain in North America.
- How? By undertaking a variety of initiatives, including:
  - Trucking programs
  - Security initiatives
  - Rail initiatives
  - Gateway Optimization Initiatives
  - Terminal expansion
  - Measuring & monitoring
Gateway Optimization Initiatives

- **Roberts Bank Rail Corridor**
  - Project implementation plan produced
  - Work underway on the project implementation phase
  - $300 million + estimated $60 Million rail improvements

- **North Shore Trade Area**
  - Confirmation of projects/funding partners - Spring 2009 – $225 million announced Mar. 27, 2009

- **South Shore Trade Area**
  - Confirmation of projects/funding partners – Fall 2009
  - $125 Million

- **Fraser River Trade Area**
  - Terms of reference are under development
Terminal Expansion

**Deltaport's Third Berth**
✓ Project nearing completion
✓ Projected to be operational by January 2010
✓ Adds up to 600,000 TEUs of capacity
✓ Bringing the total port capacity to 3.7m TEUs

**Terminal 2 Project**
✓ Expand container capacity at Roberts Bank by adding a new three-berth container facility
✓ Preferred proponent: JV APM Terminals/SNC-Lavalin
Measuring & Monitoring Context

Supply Chain Visibility

Supply Chain Reliability

Gather and develop data and relevant metrics

Set performance standards & service expectations

Identify capacity limitations and act on opportunities for continuous improvement

Measuring & Monitoring

Benchmarks & Accountability
Measure and monitor Port Productivity and Tonnage Throughput by Commodity Group for the period of: Dec 30, 2008 to: Jun 30, 2009 [Import/Export Combined]
PMV’s Competitive Advantages

• Economies of scale
  ▪ Three continental railways
  ▪ Cost competitiveness
  ▪ Terminal capacity
  ▪ Choice of terminals and service providers

• Stability of the Canadian market

• Supply chain transparency

• Infrastructure development
Environment

- PMV manages and mitigates against adverse environmental effects
- Canada Place Shore Power Initiative
- Differentiated Harbour Dues
- Mandatory truck reservation systems
- Container truck environmental requirements
Economic Sustainability

- Most diversified port in North America
- Activities at the Port account for 129,000 jobs across Canada and 6.1 billion in wages
- Port activities generate $22 billion in economic output and 1.2 billion annually in tax revenue to all levels of government
- Planned capital investments by PMV and its tenants of $4 billion in infrastructure over 10 years
- Commitment to ensuring the gateway remains fluid in its support of the Canadian Supply Chain
Thank You
Canadian Pacific – Supply Chain Collaboration

14th Annual Fields on Wheels Conference

Winnipeg, MB
December 02nd, 2009
Vision is to be the safest, most fluid railroad in North America

- 2008 pro-forma total revenues of $5.2 billion
- Global reach through ports of Vancouver, Thunder Bay, Montreal and New York
- Prime connections to US railroads
- Enhanced network reach through DM&E to several key US Midwest markets
- In 2008: 16,793 employees in more than 1100 communities over 15,500 miles of track
- 128 year history throughout Canada and the US
Canadian Pacific

Freight Revenues

% 2008 Pro-Forma Freight Revenues

28% Intermodal
   *the retail based, truck-like service*

29% Merchandise
   *the manufacturers’ pipeline*

43% Bulk
   *the low cost bulk carrier*

Intermodal 28%

Automotive 6%

Forest Products 5%

Industrial Products 18%

Coal 12%

Sulphur & Fertilizers 10%

Grain 21%
Grain represents 21% of CP’s freight revenue

2008 CP Pro-Forma Freight Revenues $5.2 B

- US Grain: 8%
- Canadian Grain: 13%
- Vcr & T Bay: ~63%
- Other: ~37%
Canadian Grain Network

Grain Handling Network supported by mainline, branchlines & shortlines

- 1400 miles of grain related branchlines & 736 miles of shortline operators generating ~35% of volume
- >90 high throughput elevators in CP’s network generating ~80% of volume
- CP currently maintains 141 producer car sites in Western Canada
Canadian Grain
An Integrated Network

Significant interdependencies in a complex supply chain

~ 280 country elevators

Elevators
Grain Availability
Weather
Insufficient Resources

14 Primary Export Terminals

Terminals
Congestion
Vessel Availability
Weather
Insufficient Resources

~ 80 Processors

Processors
Production Schedules
Sales Programs
Weather

Empty Returns

Railways
Labour Issues
Derailments
Insufficient/Too Many Resources
Weather/Interline movements

Producers
Grain Availability
Weather
Trucking Capability
Canadian Grain

Value Proposition

*Design, Sell and Deliver*

**Product Centric Model**

“Manage complex supply chains & joint accountability”

**Customer Relationship Management**

“Collaboration with customers”

**Consistent & Reliable Service**

“Continuous Improvement”
Canadian Grain franchise delivering a high quality, efficient, integrated supply chain.

Focused on:
- Just in Time – “Demand Pull”
- Quality – “Continuous Improvement”
- Operating Stability – “Scheduled & Balanced”
Operating performance improvements driving pipeline fluidity

Empty Order Fulfillment (EOF)  
“16% Improvement vs 2007/2008”

Vancouver Weekly Unloads  
“26% Improvement vs 2007/2008”

Weekly Shortfall  
“56% Improvement vs 2007/2008”
Velocity improvements driving fleet efficiency — “Moving more grain with less”

- Overall cycle time improvement of 10%
  - 13% improvement to Vancouver
  - 7% improvement to Thunder Bay
  - 28% improvement on Winter Rail
- Moved 16% more grain with ~2% less cars in 08/09 vs. 07/08 crop year.

Cycle Times
“10% Improvement vs 2007/2008”

<table>
<thead>
<tr>
<th>Crop Year</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006/07</td>
<td>20</td>
</tr>
<tr>
<td>2007/08</td>
<td>18</td>
</tr>
<tr>
<td>2008/09</td>
<td>16</td>
</tr>
</tbody>
</table>
A collaborative approach with shippers & regulators is the key to improving the overall supply chain.

Collectively we need to:

- Work together to improve origin/destination capabilities
- Focus on demand pull to enable pipeline fluidity
- Align demand forecasts and resource planning
- Develop new and expanding markets
- Continually assess product offerings and ensure they meet customer needs and are aligned with operational capabilities
Presentation to the
14th Annual Fields On Wheels Conference
Presentation by Alberto Velasco
December 2, 2009
“Plans in works to make Winnipeg North American import hub”

“With a central geographic location and skilled workforce, Winnipeg is well placed to be a major trading centre for decades to come.”

Stephen Harper, Prime Minister of Canada

“CentrePort Canada is an exciting vision we share with Manitoba’s business community, municipal leaders and others who want to build our province... This will allow us to create jobs, attract investment and take full advantage of our prime location in the heart of North America.”

Gary Doer, former Premier of Manitoba and Ambassador of Canada to the United States

“The inland port is a major economic vision and an exciting opportunity for Manitoba.”

David Angus, President of the Winnipeg Chamber of Commerce
The Manitoba Advantage
Manitoba’s Diversified, Strong Economy

- Growth is based across sectors, including:
  - Aerospace, Information & Telecommunications, Food Processing & Agriculture, Biotechnology & Life Sciences, Transportation Equipment, Original Equipment Manufacturing Cluster, Energy

- In 2009, the Conference Board projects positive GDP growth for Manitoba, one of the best in Canada

- Record-high labour force participation rate

- Led provinces in private capital investment in 2008. Private capital investment has grown 42% over the last 3 years.

- In 2008 alone, Manitoba’s private capital investment increased 15.2%
Manitoba’s Economic Framework

“...our current forecast has the province standing alone in the country in eking out a gain in real GDP this year…”

RBC Provincial Outlook, September 2009

Balanced Budget
- Manitoba was one of only two provinces in Canada to introduce a balanced budget
- Manitoba’s Budget 2009 marks the first time in 50 years that a government has presented 10 balanced budgets in a row

Zero Percent Small Business Tax
- Manitoba will be the first province to eliminate the small business income tax

KPMG Competitive Alternatives, Special Report: Focus on Tax
- Winnipeg has a lower effective Corporate Income Tax Rate and a lower Total Effective Tax Rate than 58 of 59 U.S. cities in the study

Tax Increment Financing (TIF)
- Helps overcome financial challenges by providing upfront grants based on the amount of property tax a developer will pay once the project is completed
- Legislation in place designating CentrePort as a geographic area for TIF
Technology to Support Growth

“Between 2003 and 2008, labour productivity in Manitoba rose by 8.4%, the highest five year growth rate among the comparison jurisdictions.”

Chartered Accountants of Manitoba, 2009 MB Check-Up

Composites Innovation Centre
- Sponsored by private industry and government
- A ‘one stop shop’ with core technologies on Composites, Bio-Composite Materials and Structural Health Monitoring
- Internationally recognized for the development and commercialization of biofibres for composite applications

Food Development Centre
- “From the Farm Gate to Your Plate”
- Centre of excellence in developing and commercializing new/innovative food products and natural health products
- Assistance from initial research, product testing and scale up, to quality evaluation and marketing

Advanced Manufacturing Initiative
- Aims to improve the productivity and competitiveness of Manitoba manufacturers by offering training in lean manufacturing and by promoting human resources and leadership development
Investment in Competitiveness

Corporate Taxation Rates
- Canada will have the lowest statutory corporate income tax rate and lowest overall tax rate on new business development in the G7 by 2012 and 2010 respectively.

Tariff Reduction
- Elimination of machinery and equipment tariffs and examination of tariff relief for manufacturing imports

Blue Sky Policy
- Since 2006, proactively pursuing bilateral open sky-like agreements. New or expanded agreements reached with the US and 44 other countries, including all 27 EU member countries.

Infrastructure in Manitoba
- $460 million to support CentrePort Canada: CentrePort Canada Way, Port of Churchill improvements, Hudson Bay Railway rehabilitation, Emerson Highway 75 improvements, interchange at TransCanada Hwy and Yellowhead Hwy
Manitoba’s International Export Growth

billions of CDN dollars

2004: $9.3
2005: $9.3
2006: $10.2
2007: $12.2
2008: $12.8
Increasingly Global Economy

Manitoba’s total trade
Billion CDN dollars

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ 22.62</td>
<td>$ 25.34</td>
<td>$ 28.27</td>
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</table>

Main trading partners

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>United States</td>
<td>75.59 %</td>
</tr>
<tr>
<td>China</td>
<td>4.67 %</td>
</tr>
<tr>
<td>(including Hong Kong)</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>2.98 %</td>
</tr>
<tr>
<td>Mexico</td>
<td>2.43 %</td>
</tr>
</tbody>
</table>
Increasingly Global Economy

Canada’s total trade
Billion CDN dollars

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
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<tbody>
<tr>
<td>$</td>
<td>808.27</td>
<td>827.26</td>
<td>888.86</td>
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Main trading partners

<p>| | |</p>
<table>
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<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>65.32 %</td>
</tr>
<tr>
<td>China (including Hong Kong)</td>
<td>6.16 %</td>
</tr>
<tr>
<td>Japan</td>
<td>2.94 %</td>
</tr>
<tr>
<td>U.K.</td>
<td>2.81 %</td>
</tr>
<tr>
<td>Mexico</td>
<td>2.60 %</td>
</tr>
</tbody>
</table>
Global Trade Dynamics

“A key task facing global enterprises, including transport undertakings, is to integrate supply chain production/distribution in sites located in different regions of the world more effectively.”

Source: International Transport Forum (2009), Draft report “Globalisation and its impact on inland and intermodal transport”.
Making CentrePort Canada THE Place to Access the Global Marketplace
The Five “L”s of Inland Port Development:

- Location
- Land
- Logistics
- Labour Pool
- Love
☑ Location
Location, Location, Location
Manitoba is located in the heart of North America
Western Canada has a system of transportation and trade assets for Canada to reach local and global markets:

- **Asia Pacific Gateway**
  - Trans Canada Corridor
  - Northwest Corridor
- **Quebec-Ontario Gateway**
  - Trans Canada Corridor
  - Windsor/Detroit
- **NAFTA Gateway**
  - Mid-Continent Corridor
  - Eastern USA Seaboard
  - Mexico
- **Arctic Gateway**
  - Air Polar Routes
  - Marine Polar Routes
- **Atlantic Gateway**
  - Halifax Port
Investment in Manitoba as a Gateway to the Mid-Continent
24 Hour Transshipment Distribution Coverage from Winnipeg
✓ Land
CentrePort Canada

- 20,000 acres with phased-in development of shovel-ready land in North West quadrant of Winnipeg
- A ‘one-stop-shop’ for business
- Ready for investment and development
- Competitive business costs and business incentives
Draft Conceptual Land Use Plan for CentrePort Canada Lands
Logistics
Trains

- Winnipeg is the only major city in western Canada that is served by three continental railways: CN, CP and Burlington Northern-Santa Fe
- Extensive marshalling yards and servicing facilities
- Intermodal terminals for transfers between rail and road modes
Planes

- 24-hour unrestricted airport
- Largest number of dedicated cargo handlers in Canada
- One of the most reliable airports in the world
- Worldwide freight forwarding
Ships

Direct access to Asian markets via Canada’s Asia-Pacific Gateway

Port of Prince Rupert
• North America’s deepest natural harbour and the closest port to Asia
• $170 million Fairview container terminal (opened Sept 2007)
• CN

Port Metro Vancouver
• Largest and busiest port in Canada
• 4th largest tonnage port in North America
• CN and CP

Churchill Gateway System
• $68 million Federal-Provincial- OmniTRAX commitment to capital upgrades to the Hudson Bay Railway and Port of Churchill
Trucks

- Emerson is one of Canada’s top border crossings, processing about $16.0 billion in trade traffic annually
- More than 1,000 for-hire trucking companies that operate either interprovincially or internationally
$212.5 M Investment in CentrePort Canada Way

- CentrePort Canada Way (CCW) route continuity to Chief Peguis Trail extension
- CCW north/south alignment between Sturgeon Road and Summit Land Fill
- PTH 6 connection to Inkster Boulevard
- Silver Avenue connection
✓ Labour Pool
Labour

Competitive Wage Rates

- Manitoba’s $19.13 average hourly wage is the lowest in Western Canada and one of the lowest in Canada

Education

- Co-op Education and Apprenticeship Tax Credit – the most comprehensive credit of its kind in Canada
- Tuition Fee Income Tax Rebate – Post-secondary graduates who locate and work in Manitoba can claim 60% of eligible tuition fees, up to $25,000
- Targeted College Training Programs to Meet Industry Needs – the new Heavy Equipment Transportation Centre increases RRC’s capacity to train technicians and supports Manitoba’s green-energy economy through applied research and advanced training in leading-edge technologies
- Certification in Logistics by the Transport Institute (University of Manitoba).

Labour Force Stability and Diversity

- In 2008, Manitoba’s person days lost per 1,000 employees was less than one-third the Canadian average
- Over 100 languages spoken
Manitoba’s Growing Population and Skilled Labour Force

2008 gains – largest immigration increase in 35 years

January 1, 2009 population: 1,213,800

Thousands of Persons

<table>
<thead>
<tr>
<th>Year</th>
<th>1987</th>
<th>1989</th>
<th>1991</th>
<th>1993</th>
<th>1995</th>
<th>1997</th>
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<th>2003</th>
<th>2005</th>
<th>2007</th>
<th>2009</th>
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</thead>
<tbody>
<tr>
<td>Gain</td>
<td>6.8</td>
<td>5.1</td>
<td>1.8</td>
<td>3.4</td>
<td>3.8</td>
<td>4.2</td>
<td>5.1</td>
<td>5.7</td>
<td>5.3</td>
<td>4.7</td>
<td>0.8</td>
<td>9.5</td>
</tr>
<tr>
<td>Gain</td>
<td>8.1</td>
<td>4.6</td>
<td>5.5</td>
<td>5.5</td>
<td>4.0</td>
<td>4.6</td>
<td>5.5</td>
<td>8.1</td>
<td>6.8</td>
<td>3.9</td>
<td>13.7</td>
<td>13.3</td>
</tr>
</tbody>
</table>
✓ Love
Partnerships and Mandate

Strong Public-Private Partnerships
- Continue to build on the great relationships that have been forged with public and private sector stakeholders.

Mandate of CentrePort Canada, according to the CentrePort Canada Act:
- To facilitate the long-term development and operation of the inland port by:
  - Coordinating land development and business investment;
  - Promoting environmentally sustainable policies and operations;
  - Consulting community stakeholders and port users.
- To facilitate and encourage investment in the inland port by:
  - Acting as the primary point of contact for potential investors;
  - Attracting new investment and economic development in the inland port area;
  - Collaborating with governments in the development of investment incentives.
- To promote the inland port by:
  - Marketing the inland port domestically and internationally;
  - Participating in organizations formed to develop or promote inland ports; transportation gateways and trade corridors with links to the inland port area.
## CentrePort Canada Board of Directors

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Nominator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair:</td>
<td>Kerry Hawkins</td>
<td>Business Council of Manitoba</td>
</tr>
<tr>
<td>Vice Chair:</td>
<td>Arthur Mauro</td>
<td>City of Winnipeg</td>
</tr>
<tr>
<td>Directors:</td>
<td>Ryan Craig</td>
<td>Federal Government</td>
</tr>
<tr>
<td></td>
<td>David Fung</td>
<td>Board Nominee</td>
</tr>
<tr>
<td></td>
<td>Eugene Kostyra</td>
<td>Provincial Government</td>
</tr>
<tr>
<td></td>
<td>Joan Hardy</td>
<td>Board Nominee</td>
</tr>
<tr>
<td></td>
<td>Chris Lorenc</td>
<td>Winnipeg Chamber of Commerce</td>
</tr>
<tr>
<td></td>
<td>Tom Payne Jr.</td>
<td>R.M. of Rosser</td>
</tr>
<tr>
<td></td>
<td>Gord Peters</td>
<td>Manitoba Chambers of Commerce</td>
</tr>
<tr>
<td></td>
<td>Maureen Prendiville</td>
<td>Board Nominee</td>
</tr>
<tr>
<td></td>
<td>Barry Rempel</td>
<td>Winnipeg Airports Authority</td>
</tr>
<tr>
<td></td>
<td>Bob Silver</td>
<td>Destination Winnipeg</td>
</tr>
<tr>
<td></td>
<td>Don Streuber</td>
<td>Manitoba Trucking Association</td>
</tr>
<tr>
<td></td>
<td>Robert Ziegler</td>
<td>Manitoba Federation of Labour</td>
</tr>
</tbody>
</table>
CentrePort Canada’s Vision
Marketing CentrePort Canada – Canada’s First Foreign Trade Zone

- FTZ - designated “zones” where goods can be stored, manufactured/processed and re-exported without paying duties and taxes.

- Canada-Manitoba CentrePort International Business Development Project - will provide a one-stop shop for businesses dealing with CentrePort.

- FTZ designation will enable CentrePort to:
  - Be a hub for international manufacturing, transportation, distribution and warehousing;
  - Provide domestic businesses with some of the tools necessary to be internationally successful
  - Increase trade and new jobs
Key First Steps

✔ Apply a Supply Chain-wide Approach to Development
  – Focus on “integrative trade” – decreasing trade barriers to maximize efficiency and reduce costs
  – Reinforce the idea of transportation *systems* by focusing on gateways and global supply chains
  – Decrease border congestion by coordinating regulations

✔ Invest in Strategic Infrastructure
  – Build a rail-friendly infrastructure environment
  – Service the lands
  – Road connections

✔ Work with Governments and Other Partners on Cost Competitiveness
  – Evaluate aviation taxes
  – Improve air transportation policy to enhance competitiveness (“Open Skies”)
Identify Investment Based on Manitoba’s Niche Opportunities

- Warehousing service providers
- Distribution service providers
- Logistics providers:
  - 3rd Party Logistics
  - Cargo distributors
  - Freight forwarders
  - Trucking firms
- Advanced Manufacturers:
  - Component parts
  - Final assembly
- Aerospace firms
- Food processing and distribution companies
Thank you

www.centreportcanada.ca
Information Management and Value Added
Internet Trading – Identity Preserved High Value Agricultural Products (IPHVAP)

To: University of Manitoba, “Field of Wheels” 14th Annual Conference
By: John Graham, IBM Canada Ltd. (204-938-7916; jgraham@ca.ibm.com)
Date: December 2, 2009
Innovation occurs at the intersection of invention & insight

“Innovation is our mission.
The guiding compass of everything we do.
Smarter, safer, more fuel-efficient vehicles.”
- Howard Stringer, Chairman and CEO, Sony Corporation

“Constant reinvention is the central necessity at GE...
We're all just a moment away from commodity hell.”
- Jeffrey Immelt, Chairman and CEO, GE

“We will fight our battles not on the low road to commoditization, but on the high road of innovation.”
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“More and more CEOs are adopting an innovation agenda.”
- Sam Palmisano, IBM Board of Advisors

“Electronics Industry Lacks Innovation, Philips CEO Charges”
- EE Times, Sept. 27, 2005

“Innovation continues to be a key driver in the success of our business.”
- Tom Taylor, Executive VP of Merchandising & Marketing, Home Depot, Aug. 20, 2005

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Value Chain Paradigm Shifts
Value Chain Paradigm Shifts

Farm → First Originator → Port Trans Loading Terminal → Port Sea Terminal → Container → Port Sea Terminal → Port Trans Loading Terminal → Consumer

97 Days for bulk

Farm → First Originator → Container → Consumer

21 Days for container
Agriculture Value Chain Needs

1. Producers to maximize product value – no commodities
2. Buyers to find traits that suit or match their production processes, which allows for more margin potential
3. Officials to trace problems that occur from gate to plate
4. Freight Forwarders to adopt more effective use of their logistics assets, and more environmentally efficient use of fossil fuels to move products
5. Summary: Market Coordination & Business Model Innovation
Identity Preserved High Value Agricultural Products (IPHVAP)

Growing number of Seed & Crop Varieties

Exchange, Data Base & Logistics

Identity Preserved High Value Agricultural Products (IPHVAP) & Food Traceability

One Stop Service for Buyers & Sellers

$110B USA Annual Market

Product Segregation in Containers

$110B Non-USA Annual Market

US Patent #7,080,034

Note: Similar to www.chemconnect.com (like “e-Bay for commodities”)
Review of IPHVAP Market & Business Model - 1

- Bruce Abbe, ED, Midwest Shipper’s Association (MSA) (Minneapolis, MN)
- Laura Anderson, Nat’l. IP Manager, Canadian Grain Commission (CGC)
- Gordon Bacon, CEO, Pulse Canada
- James Battershill, Policy Analyst, Keystone Agricultural Producers (KAP)
- Brian Bohunicky, Director General, Int’l. Markets Bureau, AAFC
- Bruce Brolley, Business Development Specialist, Pulses, MAFRI
- Alex Campbell, Policy Economist, Agric. & Agri-Food Canada (AAFC)
- Greg Cherewyk, COO, Pulse Canada
- Gordon Cherwoniak, Sr. Marketing & Trade Officer, Agric. & Agri-Food Canada (AAFC)
- Andre Dagenais, Act. Deputy Dir., Traceability, Agric. & Agri-Food Canada (AAFC)
- Greg Dandewich, *VP, Destination Winnipeg (CentrePort)
- Mark Dangerfield, Monsanto (St. Louis, MO)
- Richard Danis, Director, Manitoba Infrastructure and Transportation (MIT)
- Wayne Digby, *Exec. Dir., Manitoba Forage Council (MFC)
- Daryl Domitruk, Director, Agri-Food Innovation & Adaption (MAFRI)
- Ted Eastley, *ED, Manitoba Rural Adaptation Council, Inc. (MRAC)
- Chuck Elsea, CEO, The Scoular Company (Kansas City, Kansas)
- Todd Frederickson, Regional Director, Transport Canada
- Dr. Gary Fulcher, UM, Fac. Of Agriculture & Food Sciences
- Diane Gray, *CEO, CentrePort Canada
- Mark Hemmes, CEO, Quorum Corporation
- Troy Wm Hobbs, Monsanto (St. Louis, MO)
- John Jansen, Monsanto (St. Louis, MO)
- John Knubley, Deputy Minister, Agriculture & Agric-Food Canada (AAFC)
- Dr. Jake Kosior, Sr. Planning Consultant, MB Infrastructure & Transportation (MIT)
- Stephen Lavergne, Dir., Grains & Oilseeds Div., Agric. & Agri-Food Canada (AAFC)
- Mike Lesiuk, Director, Policy, MB Agriculture, Food & Rural Initiatives (MAFRI)
Review of IPHVAP Market & Business Model - 2

- Dan Lutz - Director, Traceability, Agriculture & Agri-Food Canada (AAFC)
- Reynold Martens - COO, GHY International (GHY) – Custom Brokers
- Lorne Martin - ADM, MB Agriculture, Food & Rural Initiatives (MAFRI)
- Bob Nawolsky - Dep. Dir., MB, Agric. & Agri-Food Canada (AAFC)
- Beth Nordin - VP, IT, CHS Inc. (Minneapolis, MN)
- Carolyn Osborn - Manager, Agri-Food Policy, MAFRI
- Len Penner - CEO, Cargill Limited
- Tom Pearson - Director, IT, CHS Inc. (Minneapolis, MN)
- Dr. Barry Prentice - ED, UM Transport Institute (UM TI)
- Dr. Allan Preston - ADM, MB Agriculture, Food & Rural Initiatives (MAFRI)
- David Shambrock - ED, MB Food Processors Association (MFPA)
- Allen Sturko - National Research Council (NRC)
- Dr. Barry Todd - *DM, MB Agriculture, Food & Rural Initiatives (MAFRI)
- Dr. Michael Trevan - *Dean, UM, Fac. of Agric. & Food Sciences (UM AFS)
- Denis Tulley - Agriculture & Agri-Food Canada (AAFC)
- Dr. Ed Tyrchniewicz - Senior Scholar, UM Fac. Of Agriculture & Food Sciences
- Alberto Velasco - International Business Development, CentrePort Canada
- Erica Vido - Mgr., Trans. Policy, MB Infrastructure & Trans. (MIT)
- Ian Wishart - *President, Keystone Agriculture Producers (KAP)
- Dr. Karin Wittenberg - Assoc. Dean, UM, Fac. of Agric. & Food Sciences
- Michael Wood - Consultant, MB Infrastructure and Transportation (MIT)
- Susan Zacharias - Policy Coordinator, Transport Canada
10 Reasons Why IPHVAP Model Will Work

1. Buyers pay premiums for IP products
2. Bulk handling or co-mingling reduces quality
3. IP market is growing 7%/year
4. IP market is under-serviced now – need open market
5. Containers are available
6. Railways always interested in aggregated markets
7. “Revenue Cap” does not apply to all agricultural products
8. Canadian & USA cabotage laws are being harmonized
9. Shippers want selected Asian / European backhauls
10. Ships will not sink if some IP containers shipped full
Case Study: Honda Quality Soybeans

- Honda is a major exporter of premium U.S. soybeans to Japan.

- High-quality soybeans, known as White Pearls, are grown by farmers in Ohio, Indiana & Michigan. Some soybeans are harvested from Honda land that encompasses 3 of Honda's 5 auto plants in Ohio, an R&D vehicle engineering center & 7.5-mile test track & vehicle testing facility.

- Decades ago, cargo container ships that arrived in the U.S. full of automobiles and parts were shipped back to Japan completely empty.
- Honda sought a more efficient use for the container return trips and began to fill them with soybeans and other goods bound for Japan.

- High protein content - Japanese consumers wary of GMO beans.
- Honda farmers meet rigorous standards for quality and purity.
- Japanese consumers pay a premium for high-quality beans.
- Harvested beans are inspected for uniformity of size and shape.
- Approved beans are shipped to consumers in Japan for tofu and soymilk.
- Exports handled by Honda Trading America Corp./1972 founded subsidiary.

IPHVAP Business Plan

**Phase 1**
“Feasibility Study”
- Environmental Scan
- Literature Review
- Market Assessment
- Value Chain Analysis
- Business Model Validation
- Business Plan
- $400-500K

**Phase 2**
“Pilot”
- Selected Buyers and Sellers
- Basic Transactions
- Value Chain Links
- Refinements and Recommendations
- $1M (IT) + $1-2M Working Capital

**Phase 3**
“Production”
- Expansion
  - Products
  - Markets
  - Functionality
  - $5-8M Estimate

Think Big, Start Small, Grow Fast!

- **Public Sector Funding**
  - 6 months
- **Private Sector Funding**
  - 6 to 9 months
- **Private Sector Funding**
  - 6 to 18 months
Business Innovation

Business Innovation Occurs at the Intersection of Invention And Insight

“We will fight our battles not on the low road to commoditization, but on the high road of innovation.”

– Howard Stringer, Chairman and CEO, Sony

“Constant reinvention is the central necessity at GE… We’re all just a moment away from commodity hell.”

– Jeffrey Immelt, Chairman and CEO, GE2
Increasing Market Access Through Innovation - “Opportunities to Preserve the Value of Biotech Traits”

Fields on Wheels
Dec 2, 2009
What Is Happening To Health?

Just when we should be enjoying the greatest health in the history of humans, and some are, the majority of people in the Western World are becoming overweight and diabetic and suffering from diet-related disease.
The Economist

The shape of things to come

December 13-19, 2003
CIRCUMSTANCES
Railway development in the late 1800’s lead to centralized agriculture and food processing.
• Food oils were saturated for shelf life during continental distribution
• Cereals?
OR

• Processing of foods near large urban centers = shipment of commodities
• Loss of jobs / income rurally
• Now more sustainable to ship fractions or finished products to urban areas?
Circulatory effects of endothelial dysfunction

- Endothelial dysfunction
- Impaired blood flow
- Cognitive decline
- Depression
- Neuro-degenerative disorders
- High BP
- Coronary disease
- Angina
- Stroke
- Physical incapacity
- Reduced fat, glucose metabolism

Factors:
- Obesity
- High blood pressure
- High blood sugar
- High blood fats (incl. cholesterol)
- Smoking

Can be improved/restored by regular exercise and supplementation with specific bioactive nutrients.
Goal: Live longer, live healthier

Food as Medicine - Prevention & Cure
How can this be achieved?

**Functional Foods**
*Compete w. conventional foods*
*Food Processor / Retailer Shelf*

**Nutraceuticals**
*Compete w. Pharma, Vitamin & Food*
*Pharma, Food Retailer, NHP*

Bigger, Better Pie for Food Companies and Pharma?
Trends driving FF market
Self Care as a Platform – WHO - 1998

Consumers
- More health conscious
- ‘Natural’ self-medication
- Ageing population

Health Care Professionals (HCP)
- New discoveries in FF
- Promote healthy eating

Rapid development of functional food

Government
- Rising healthcare costs
- Regulatory framework

Retailer/Marketers
- Search for growth opportunities
Functional Food
- Create Demand

Developers

Pull-through

End Users

Push

Pull

Based Upon Real or Perceived Health Benefit
Biorefining

- Biorefining seeks to integrate and optimize biomass conversion processes and equipment to produce food, fuels, power, heat, and value-added chemicals from biological starting material.
- By producing multiple products, a biorefinery takes advantage of the various components in biomass and their intermediates therefore maximizing the value derived from the biomass feedstock.
- A biorefinery could, for example, produce one or several low-volume, but high-value, chemical, food or nutraceutical products and a low-value, but high-volume liquid transportation fuels.
- By definition, the biorefining model focuses on optimization of all outputs or streams from a biological process.
# Biorefining

<table>
<thead>
<tr>
<th>High Value</th>
<th>High Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Value</td>
<td>Low Volume</td>
</tr>
<tr>
<td>Low Value</td>
<td>High Volume</td>
</tr>
<tr>
<td>Low Value</td>
<td>Low Volume</td>
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</tbody>
</table>

- Resistant Starch??
- Anti-microbials
- ACE Inhibiting peptide
- Seed coat syringols - plastics, biofilms
- Protein Concentrates?
- Starch fractions - fuels, adhesives
CEREAL GRAIN

BIOACTIVE BENEFITS

• Cholesterol Reduction
• Blood Glucose / Insulin Modulation
• Immune Effects
• Anti-oxidant
• Satiety

Aleurone - Hull / Bran
Phenols, Fibre

Starchy Endosperm
Amylose
Amylopectin
Storage Peptides / Proteins
Pentosans
Beta-Glucans

“Value Subtracted Agriculture”

~25% of the cereal grain contains >95% of the important nutraceuticals and phytochemicals

Dismissed during production of traditional products

DDG?
Biotech Traits

• “Input” traits will create value for the producer & for consumer in terms of environmental sustainability

• Biotech traits will become significant components of pest management & climate change management

• Value will not need to be “preserved” for the food processor / retailer or pharma / nutraceutical / NHP

• “Functional” traits related to food or health innovation will need to be “preserved” if they are to deliver desired outcome
Health benefits of Omega-3 PUFA

- Infant development & growth
- Promoting fitness (physical, mental, reproductive)
- Counteracting disease (prevention, treatment)

<table>
<thead>
<tr>
<th>Cardiovascular disease</th>
<th>Diabetes</th>
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<tbody>
<tr>
<td><strong>lipids (TG, HDL)</strong></td>
<td>Metabolic Syndrome</td>
</tr>
<tr>
<td>blood pressure</td>
<td>insulin resistance</td>
</tr>
<tr>
<td>arterial compliance</td>
<td>abdominal adiposity</td>
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<tr>
<td>endothelial dilatation</td>
<td><strong>Inflammatory disorders</strong></td>
</tr>
<tr>
<td>platelet aggregation</td>
<td>psoriasis/dermatitis</td>
</tr>
<tr>
<td>heart rate</td>
<td>rheumatoid arthritis</td>
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<tr>
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<td>inflammatory bowel disease</td>
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<td>immune renal disease</td>
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<td>atherosclerosis</td>
<td>peridontal disease</td>
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<td>ischemic heart disease</td>
<td>osteoporosis?</td>
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<tr>
<td>heart failure</td>
<td>asthma?</td>
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<tr>
<td>kidney damage</td>
<td><strong>Behavioural disorders</strong></td>
</tr>
<tr>
<td>stroke</td>
<td>depression, bipolar disorder</td>
</tr>
</tbody>
</table>

**Cancer?**
Amplification / Enhancement

PUFAs
n-3 protects:
- Lowering / reducing blood pressure and heart rate; serum triglycerides, thrombotic tendency, inflammation, arrythmia;
- Improving endothelial function, insulin sensitivity, plaque stability

Medium chain n-3: alpha-linolenic (ALA)
- Plants: Flax, borage, hemp, canola, walnuts

- Long chain n-3: eicosapentaenoic (EPA), docosahexanoic (DHA)
  - Oily fish: Salmon, herring, trout, sardines, tuna

- Essential - body cannot produce
  - Brain stem, eye (dimentia, macular degeneration) + general use

- Can convert ALA to EPA, DHA but very inefficient and conversion variable
Amplification / Enhancement

PUFAs

Long chain n-3: eicosapentaenoic (EPA), docosahexanoic (DHA)

• Rapidly declining fish stocks globally
  – Cannot supply world n-3 demand if we ate our dietary recommended amount in ecologically sustainable manner
  – Lancet (March) - meta-analysis
    • NO EVIDENCE of n-3 benefit on mortality
    • Dioxins and methyl-mercury
Amplification / Enhancement
Long chain n-3: eicosapentaenoic (EPA), docosahexanoic (DHA)

- Enhance conversion of ALA to EPA, DHA using chemical enzyme modification
  - Desaturases, elongases isolated from yeast, algae, protozoa, nematode
  - Inefficient, costly

- MOST Sustainable Path - GMO

- Genetically engineer “fish oil PUFA pathway” into plants
  - flax, canola - have abundant ALA for precursor
  - Combine with “high oleic” transgenic canola
**Amplification / Enhancement**

1. Identify and clone genes which code for *desaturase* and *elongase* enzymes for pathway
2. Cassette - fuse to suitable promoters, etc.
3. Transform into plants - *Agrobacterium*, particle gun
4. Verify gene presence - PCR
5. Verify gene activity - protein & fatty acid
   *GC/MS/MS; LC/MS/MS*

**Elongation:** addition of 2 C

**Desaturation:** Intro of double bond. Conversion of saturated to unsaturated is central to PUFA synthesis

- 1 - 2 genes or up to 8 or 9 genes transformed and expressed.
Soy Isoflavone Supplementation improves Spatial Working Memory in Males

Well documented cognitive differences between sexes

Superior at:
- Verbal Recall
- Spatial working memory
  (Recall Object & Location)

Superior at:
- Mathematical reasoning tasks
- Spatial visualisation
  (Recall location only)

ACE Inhibiting Pea Peptides

Prevention & Therapeutic

Renin-angiotensin

Kallikrein-kinin

Ace Inhibition lowers blood pressure - significant target
First therapeutic compounds from snake venom
Significant side effects

Aluko - RCFFN
Prebiotics / Probiotics

Obesity and bacteria

Greedy guts?
Resistant Starch

Starch is made up of glucose molecules linked together to form amylose and amylopectin. Amylose has a linear molecular structure and can stack to form tightly packed granules which is insoluble and hard to digest whereas amylopectin has a branched structure and thus cannot form tightly packed granules and is thus easier to digest.

Most plants contain about 20-25% amylose. But some, like pea starch have 60% amylose and certain species of maize starch have 80% amylose (e.g. Hi-Maize(r)) - these plants are therefore very high in RS.

The physical and chemical composition of starch determines whether starch is digested in the small intestine or whether it ferments in the colon.
Resistant Starch

- **Resistant starch** is especially associated with one type of SCFA, called butyrate, which is protective of colon cells and associated with less genetic damage (which can lead to cancer). Butyrate also protects the cells in other ways. This is one of the real strengths of resistant starch over oligosaccharides and soluble fiber. Their fermentation does produce butyrate, but not at the levels of resistant starch.
- As with other fermentable fiber, resistant starch is associated with increased mineral absorption, especially calcium and magnesium.
- Perhaps most exciting for people with sugar issues, resistant starch seems to improve insulin sensitivity. In the so-called "second meal effect", fermentable fiber and resistant starch are associated with improved glucose tolerance the next day. There is evidence that this is caused by the presence of the short chain fatty acids, and by a peptide produced in the fermentation process.
- Resistant starch produces more satiety, possibly partly through the release of a different peptide (PYY).
- Resistant starch consumption is associated with lower cholesterol and triglyceride levels.
- Promotes "good" bacteria, and supresses "bad" bacteria and their toxic products.
- Promotes bowel regularity.
- Resistant starch in a meal is associated with less fat storage after that meal.
Plant-Based Vaccines & Insulin

• Using GE to produce vaccines in plants:
  – Instant scalability?
  – Oral activity - no needles
  – Heat stability - don’t need to store in cold in remote areas
  – Innate & Acquired Immune system?

• REALITY - Vaccine adjuvants
<table>
<thead>
<tr>
<th>Company</th>
<th>Platform</th>
<th>Product and stage of development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biolex, Pittsboro, North Carolina</td>
<td>Duckweed (<em>Lemna</em>)</td>
<td>Locteron (controlled-release α-interferon for hepatitis B and C), completed Phase 1; fibrinolytic clot buster, preclinical</td>
</tr>
<tr>
<td>Chlorogen, St. Louis</td>
<td>Tobacco chloroplasts</td>
<td>TGF-β for treatment of ovarian cancer; animal vaccines</td>
</tr>
<tr>
<td>Cobento, Aarhus, Denmark</td>
<td><em>Arabidopsis thaliana</em></td>
<td>Human intrinsic factor (rhIF for diagnostics), in market; rhIF plus vitamin B12 for B12 deficiency, in clinical trials</td>
</tr>
<tr>
<td>Dow AgroSciences, Indianapolis</td>
<td>Non-nicotine tobacco plant cell culture</td>
<td>Newcastle disease vaccine for poultry, approved by USDA 2/2006</td>
</tr>
<tr>
<td>Farmacule BioIndustries, Brisbane, Australia</td>
<td>Tobacco, sugarcane</td>
<td>Virtonecin, available in late 2006–early 2007; proteases</td>
</tr>
<tr>
<td>Guardian Biotechnologies, Saskatoon, Saskatchewan</td>
<td>Canola, oriental melon</td>
<td>Poultry vaccine for coccidiosis, Phase 2 (Canada)</td>
</tr>
<tr>
<td>Meristem Therapeutics, Clermont-Ferrand, France</td>
<td>Corn</td>
<td>Meripase (cystic fibrosis and lipid-storage disorders), field trials and testing; lactoferrin (gastrointestinal disorders), Phase 1</td>
</tr>
<tr>
<td>Nexgen Biotechnologies, Daejeon, Korea</td>
<td>Potato, cucumber, oriental melon, tobacco</td>
<td>Thyroid-stimulating hormone receptor (diagnosis of Graves disease), projected marketed in 2006; hemorrhagic fever virus antigens for diagnosis, poultry vaccine for avian influenza (H5N1), epidermal growth factor, albumin fusion protein</td>
</tr>
<tr>
<td>Planet Biotechnology, Hayward, California</td>
<td>Tobacco</td>
<td>CaroRx (SIgA for tooth decay prevention) Ph 2, RhinoR (a fusion of human ICAM-1 and human IgA for the common cold)</td>
</tr>
<tr>
<td>Protalix, Israel</td>
<td>Plant cell culture</td>
<td>Glucocerebrosidase (Gaucher disease), Phase 1; fully humanized IgG (preclinical development)</td>
</tr>
<tr>
<td>SemBioSys Genetics, Calgary, Alberta, Canada</td>
<td>Safflower</td>
<td>Insulin, apolipoprotein A-1; immunospheres</td>
</tr>
</tbody>
</table>
Agriculture Value-Added

• Cannot defy the laws of gravity!
• Commodity supply chain believes that “Value-added” is the value that is added to their profitability.
• Greater profits – higher margins, expanded sales – are EARNED in the marketplace.
• Can only be earned by providing customer with additional value.
• Providing consumer looking for taste & convenience & HEALTH from plant bioactives will be difficult to achieve by blending to tolerance levels.
Current Commodity Movement

Generally moving right = larger lot sizes

In commodity system end use accepts high volume of generic products

Sonka et al. 2000
Evolving Movement

Medium - Large Volume
• On farm storage NB
• Elevators handle multiple channels?
• OR Production zones around specific destinations

Sonka et al. 2000
Evolving Movement

Small - Medium Volume
- Many accumulation sites OR
- End users build processing in strategic areas - CenterPort?

Sonka et al. 2000
Identity Preserved vs. Segregation “single malt” vs. “blended”

- IP involves establishing identity of product that is retained up to the end user.
- Desired attribute(s) measured at farm and this “lot” is then kept to end use
- Segregated system – Attributes measured and “like” products mixed with other “like” products - but individual “lots” lose their identity
  - May require additional testing at end point
Role of Information

• Low cost information systems has resulted in explosion of data that can be captured or utilized by both the supply chain and the end-use customer.

• Profile - purchaser, demographic dimensions, purchase situation, product attributes, etc.
Role of Information (2)

• However, to be successful in capturing value from information, have to aggregate this information.

• FIRST MOVER ADVANTAGES accrue to first firm to effectively create a system that can exploit one or multiple aggregation potentials.

• AGGREGATE the INFORMATION, Not the commodity
Role of Information (3)

• Achieve FIRST MOVER ADVANTAGES by providing differentiated product offerings to those market segments which can derive particularly large benefits from consuming those products.

• Enhanced food processing functionality?
• Organic? Other production systems?
• Enhanced health functionality / efficacy?
• Environmental safety?
Technology - Traceability

- Currently between grocer / retailer and food manufacturer - sophisticated.
- Farmer / primary handler have opted out...
  - May not be possible much longer...
    - Food safety / allergenicity
    - Consumers want information on farm production practices used to produce the food & are factoring this into purchase decisions
- Farmer / primary handler may be missing opportunity...
Attribute Qualification, Quantification & Validation, Process Certification

• Maintain information for many more attributes than current grading system utilizes
• Will require many different qualification, quantification and validation “tests” pertaining to attributes and process
• Where will this be collected?
• How will this information be managed, stored and utilized?
Testing & Information

• As primary producer knowing “what you have” and “getting information to customers” will likely result in higher returns

• In Biorefining economy - some process will be optimized by “what you have”

• Biorefiner will need to know “what you have”

• NEW COMPETENCIES...
“Although humans make sounds with their mouths and occasionally look at each other, there is no solid evidence that they actually communicate among themselves”
Additional
RCFFN Development Process for Functional Foods and Nutraceuticals

- Research
  - Is there a bioactive plant to deliver?
- Development and Testing
  - Is it safe and effective?
- Manufacturing and Distribution
  - Can it be produced and delivered efficiently?
- Consumer
  - Will they like it?

Increased Health and Economic Benefits

Seed and Ongoing Public Funding
Market Demand

GE³LS
Wellness Foods Interface

Foods

Wellness Foods
Nutraceuticals

Pharmaceuticals

Foods (Nutrients)

Health Foods

Supplements

Drugs (Actives)
On-farm...

Plant and Animal
- Selective breeding
- GM
- bioactive isolation by compatible process

Plant and Animal Transgenics
- expression of high value bioactives
- bioactive isolation by compatible process (optional)
  - eg, golden VitA-rich rice, human lactoferrin expressed in rice and bovine milk

Results for today  Ideas for tomorrow
Wheat Value Chain

The US Quality First Program

Dwayne Lee
Marketing Manager, USA
What do our customers want?

How has the US Quality First program evolved to meet these needs? How does it work?

What opportunities/challenges lie ahead to enhance the returns to growers?
Growing the pie.....enhancing the demand pull
What do our customer want?

Importance to Customer Satisfaction

- Product quality
- Product cleanliness
- Quality service
- Reliability / timeliness
- Meeting contract quality

Very Important
Important
Product quality is big deal…..

American bakeries require consistency
- Automated plants
  - Unskilled labor
- Push button baking
- Better yields/lower costs
- Competitive baking industry
  - Retailers/consumers are price sensitive

More complex flour segments
- Frozen dough & parbaked goods
- McDonalds-uniform buns
- Papa Johns- Intense growth
- Subway- Rolls must be 12 inches

Artisan baking
- by hand, feel, taste and smell
- consistency is less important
- product taste and smell is key
Reliability/delivery/execution....just as important

• On time - the standard
  – Cash flow management (demurrage, inventory, etc)

• Consistent mixes must go to the mills – customer wants what they bought.

• Just in time inventory is the norm

• Railroad & weather logistics risk must be managed by suppliers
Growing the pie.....reinventing the supply chain
Early days of the US program

- Can/US border opened in 1991
- Port export oriented, interior rail was new, tariff still applied
- Product quality was there but the supply chain was much more fragmented
  - Bad attitude/ no performance/accountability
  - More elevators, small rail blocks
  - Sampling issues
  - High dockage product
- Resulted in poor execution (55%)

- Mid 1990’s Crow Rate removal made the US much more attractive
  - Cleaning in the interior
- Rationalization of the railways/grain handling system
  - Moved 25 car trains – on-site inspection
- Facilitated a move to the Quality First Program we use today.
Quality First Program took the supply chain to the next level…..

- Customer-focused, commercial-based contract execution system
  - Capitalized on changes in the supply chain
    - On-site inspection
    - Commercial agreements incorporate financial penalties/rewards for performance
    - Increased execution performance to over 90%
  - Capitalized on the natural product quality advantages the Canadian variety registration and grading system provides.
    - Minimizes variations in milling and baking quality attributes
    - high extractions
    - good bakes
    - high water absorptions
    - compatibility with U.S. or other wheat in formulas
Quality First Program Pillars

- Consistency
- Uniformity
- Cleanliness
- Timeliness
- Planning
- Food Safety
- Product Support
Quality First at work......
US Quality First Supply Chain

Supplier/Terminal
- Supply Planning/Delivery Calls
- Cleaning/Blending
- Inspection/Sealing
- Timely Railcar Spot/Lift
- Consistent Transit Time

Production
- Variety
- Agronomics
- Delivery/Storage

Railroads/trucks/vessel

Customs Clearance
- Timely/accurate border clearance

Complete product/logistical package delivered to destination mill
The final product.......

- Clean consistent grade, protein, moisture, TW, HVK, across the whole train
- Loaded in sound cars (pre-inspected)
- Cars fully loaded to capacity
- Seals applied top and bottom
- Loaded in the week customer expected/planned
- Lifted in the week the customer expected/planned

<table>
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<th>No.</th>
<th>Prefix</th>
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<th>Grade</th>
<th>Remarks</th>
<th>DKG %</th>
<th>Protein %</th>
<th>Moisture %</th>
<th>TWT (kg/hl)</th>
<th>HVK %</th>
<th>Seals as Reported</th>
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Clearing the border

- 2002 U.S. Bioterrorism Act
  - Food and Drug Administration (FDA) Goal: “traceable/verifiable food supply chain”

- Facility Registration
- Prior Notice
- NAFTA Cert
- 750/751 end use certificates
- C-TPAT
- Shipment seals
- Increased border costs
CWB services to add value

- One-stop purchasing
- Risk Management
- Forward Pricing
- Sourcing Flexibility
- Transportation Flexibility
- Product Technical Assistance - CIGI, GRL, etc
Supply chain opportunities/challenges

Vision: Commercial Contracts

Railways

Service Contract
Cost-Based Freight Rate

CWB

Quality First
Long term supply agreements

Grain Company

Farmer

Producer Contract

Sales Contract

Customer
Supply chain opportunities/challenges.....cont’d

- Better rail rates and service guarantees
- Supply agreements
- Intrinsic quality sourcing/tracking
- Building larger train units, while maintaining flexible and dynamic service
- Maintaining a safe /secure supply chain
  - Thickening US border
  - CTPAT/PIP

- The CWB will continue to maximize returns for our growers by delivering customer value while driving toward a more competitive and lower-cost grain supply chain... the CWB will continue to partner with suppliers who help us deliver it.
Questions?
Speaker Bios
14th Annual Fields on Wheels Conference

Dr. Barry E. Prentice
Professor, Dept. of Supply Chain Management
I.H. Asper School of Business
University of Manitoba

Dr. Prentice is a Professor of Supply Chain Management, at the I.H. Asper School of Business, University of Manitoba and the former Director (1996-2005) of the Transport Institute. His major research and teaching interests include logistics, transportation economics, urban transport and trade policy. Dr. Prentice holds a degree in economics from University of Western Ontario (1973) and graduate degrees in agricultural economics from University of Guelph (1979) and University of Manitoba (1986).

Dr. Prentice has authored or co-authored more than 250 research reports, journal articles and contributions to books. His scholarly work has been recognized for excellence in national paper competitions and awards. In 1999, National Transportation Week named him Manitoba Transportation Person of the Year. Through the Transport Institute, Dr. Prentice has organized national and international conferences on sustainable transportation (Railways and the Environment), supply chain logistics (Planes, Trains & Ships), agribusiness logistics (Fields on Wheels), the potential use of airships for northern transportation (Airships to the Arctic) and food trade between Canada and Mexico (La Cadena de Frio). In 1999 and 2003, he received University of Manitoba Outreach Awards.

Dr. Prentice was instrumental in founding a major in transportation and logistics within the B.Com. (Hons.) program at the I.H. Asper School of Business (fall 2003). Since that time a new Department of Supply Chain Management has been formed, and in 2006 a M.Sc. program in supply chain management was initiated.

Dr. Prentice has served on the Boards of Directors of several transportation organizations: National Transportation Week (President, 2001 and 2003), Honourary President of the Canadian Institute for Traffic and Transportation (2001-3) and the Canadian Transportation Research Forum (Past President, 1997). Dr. Prentice is the President of ISO Polar Airships that he co-founded in 2005 as a not-for-profit research institute to promote the use of airships as sustainable
transport for the northern latitudes. He is Associate Editor of the *Journal of Transportation Research Forum*. In addition, Dr. Prentice has served on Winnipeg Airports Authority, Inc. (1998-2003), Winnipeg TransPlan 2010, the Mid-Continent International Trade Corridor Task Force, the Rapid Transit Task Force, expert committees, and is frequently asked to speak on the topics of trade and transportation.

**Dr. Paul D. Larson**  
**Director, Transport Institute**  
**CN Professor & Dept. Head, Supply Chain Management**  
**Asper School of Business**

**Paul D. Larson, Ph.D., P.Log.** is the CN Professor of Supply Chain Management at the University of Manitoba, Asper School of Business. He is Head of the SCM Department and Director of the Transport Institute. The Institute for Supply Management (ISM), formerly National Association of Purchasing Management (NAPM), funded his doctoral dissertation, which won the Academy of Marketing Science/Alpha Kappa Psi award in 1991. Paul has published nearly 50 articles in leading SCM journals, and has made numerous presentations at academic and practitioner conferences. He has consulted and conducted executive seminars, in Europe, North and South America, Australia, the Caribbean and China, on logistics and SCM. Dr. Larson serves on the Editorial Review Boards of the *Journal of Supply Chain Management* and the *International Journal of Physical Distribution and Logistics Management*. He is also a former Associate Editor of the *Journal of Business Logistics*. His current research interests include inland ports; northern transportation; supply chain risk management; not-for-profit (NFP) supply chains; and humanitarian logistics.

**Mr. Mark Hemmes**  
**President**  
**Quorum Corporation**

A career transportation professional, he manages the activities related to the Federal Governments Grain Monitoring Program. In addition to his extensive knowledge of the Canadian grain handling and transportation system, Mark has developed a broad knowledge and experience relative to the market and operational issues in the rail and intermodal system in Canada, and in particular the Western Canadian GHTS.
Prior to establishing the Quorum Group of Companies Mark spent 23 years with CN Rail where he held a variety of senior positions in the fields of marketing, intermodal, and operations including the General Manager of Marketing for Western Canada and Assistant Superintendent of Operations. Mark attended school in Edmonton at the University of Alberta and has also completed course work at the University of Western Ontario in the area of Marketing. He has also held various board and executive positions with industry associations and currently sits on the Board of Directors of the Northern Alberta Transportation Club and the Canadian Transportation Research Forum.

Mr. Ted Eastley  
Executive Director  
Manitoba Rural Adaptation Council (MRAC)

Ted Eastley graduated from the University of Manitoba with his Bachelor of Science in Agriculture (major in economics) degree and is a current member of the Manitoba Institute of Agrologists (MIA) with his Professional Agrologist (PAg) status as well as a member of the Canadian Society of Association Executives (CSAE). He was/is part owner/operator of a corporate farm (Triple E Farms Ltd.) in the Brandon area that at one time operated with 3 enterprise areas: grains and oilseeds; forage sales; and beef livestock (commercial and breeding stock). A few years ago, upon the death of one of the partners, the operation downsized and Ted did a 180º career switch into the education sector starting with teaching and eventually ending up as Dean of the Agriculture and Environment Division with Assiniboine Community College. He was with Assiniboine for a number of years in various positions, including managing a 4 year project in Africa with CIDA, until last June 2008, when he was offered the opportunity as Executive Director for MRAC.

Mr. Mark Griggs  
Acting Director of Planning & Development  
Port Metro Vancouver

Mark Griggs is Acting Director of Development in the Planning & Development Division of Port Metro Vancouver Port. He is responsible for supply chain planning, the delivery of infrastructure projects, and planning and development coordination of PMV properties. He works closely with government and commercial stakeholders to ensure that the Port’s long-term interests are met in the gateway. He is also involved in structuring funding agreements for major infrastructure initiatives.
Prior to joining Port Metro Vancouver, Mark worked on a variety of industrial, commercial and resort projects throughout Western Canada, Australia and southeast Asia. His interests outside the office include skiing, golf and travel.

**Mr. Murray Hamilton**  
**Director, Grain**  
**Canadian Pacific Railway**

**Murray Hamilton** is currently Director of Canadian Grain in Canadian Pacific’s Bulk line of business. He is located in Winnipeg. Murray has been in his current capacity for three years and is responsible for Canadian Pacific’s marketing and sales efforts for Canadian grain originations.

He has 22 years of experience with the railway. His career with CP started in 1986 when he joined the Intermodal Marketing and Sales team in Edmonton. He has held leadership roles in all three of CP lines of business; Intermodal, Merchandise and Bulk as well as in the CP’s Intermodal Customer Service team.

Murray is currently a member of the Manitoba International Gateway Council and a graduate of the University of Alberta.

**Mr. Peter Ladouceur**  
**AVP Intermodal Marketing**  
**CN**

**Peter Ladouceur** is Assistant Vice-President Marketing – Intermodal for Canadian National Railways. Based in Toronto, he has marketing and customer support responsibility for CN’s International Intermodal business.

Mr. Ladouceur began his railroad career with CN in 1980 driving spikes and running heavy equipment. He has a degree in Mechanical Engineering from McGill University and a M.B.A. from the University of Alberta. Over the past 29 years, he has worked and lived in just about every major city in Canada with increasing levels of responsibility in operations, sales and marketing.
Mr. Alberto Velasco-Acosta  
Executive Director, International Business Development & Investment  
CentrePort Canada

Alberto Velasco-Acosta is the Executive Director of International Business Development at CentrePort Canada, the country’s first Foreign Trade Zone and inland port. He is responsible for promoting investment into the 20,000 acres based upon CentrePort’s strategic and central location, easy access to North American markets, modern transportation infrastructure and tax increment financing incentives. CentrePort is a key logistics hub for international trade in Canada.

Mr. Velasco-Acosta has been involved in economic promotion activities since early in his professional career. He has worked with the Economic Promotion Office of a suburb town to the capital city of Morelia in his Mexican home-state of Michoacan. Later he joined the Michoacan state government as Head of the Department of International Commerce at the Secretariat of Economic Development. In this position, he was able to assist local companies to become export ready for the US market.

Mr. Alberto Velasco-Acosta has also been active in the private sector where he managed the family business and provided consulting services for exporting companies in Mexico for two years before moving to Canada. In Canada, Mr. Velasco-Acosta worked at Ipsos-Reid where he became a Project Manager for several market research studies conducted by this firm.

More recently, Mr. Velasco-Acosta served nearly four years as a Trade Consultant responsible for the Mexican and Chilean markets at Manitoba Trade and Investments, an agency of the provincial government. In this role, he had the opportunity to assist Manitoba companies to conduct business in Mexico, Chile and Brazil. He coordinated several trade missions from Manitoba to those markets covering different economic sectors like mining, ict, agriculture, construction, among others. In addition to the business side, Mr. Velasco-Acosta also coordinated several diplomatic missions to Mexico liaising Manitoba government officials with their counterparts in that Latin American market.

Alberto Velasco-Acosta has completed a Master’s study program on Global Marketing at the Western Technological Superior Studies Institute (ITESO), a leading private university in Guadalajara, Mexico. He also holds an undergraduate degree in International Commerce and
Relations at the Universidad Latina de America based in Morelia, Mexico. Mr. Velasco-Acosta has also recently completed the Leadership Development Program put forth by Queen’s University.

Ms. Ruth Sol
President
WESTAC

Ruth Sol is President of the Western Transportation Advisory Council (WESTAC). She joined the Council in 1983 as Research Economist and held increasingly senior positions. Previously she held positions in market research and statistical analysis at HA Simons International, a consulting engineering firm in the pulp and paper industry, and MacMillan Bloedel Limited, an integrated forest products firm.

Ruth earned a BA (economics) and an Executive MBA from Simon Fraser University. She is a member of the Association of Professional Economists of B.C.

WESTAC is a member-based organization of senior decision makers in all facets of transportation – business, labour and government, across modes. Under Ruth’s leadership, this powerful forum brings together industry leaders to debate, discuss and better understand issues affecting some aspect of transportation. The Council contributes to the excellence of the western Canadian transportation system by ensuring that the industry’s voice is heard and that the importance of transportation to our economic and social well-being is widely understood and appreciated.

Mr. John Graham
Services Executive
IBM Canada

John Graham is an experienced IBM business development executive. He has worked in sales and marketing, operations, and business development. John has assisted customers in many public sector and private sector industries including government, education, health care, life sciences, financial services, manufacturing, distribution, retail, transportation, research and development, and agriculture.

John currently co-leads an IBM Canada Ltd. agri-food traceability strategic initiative. Leveraging knowledge from other industries, this initiative will provide better information management in the agri-food
sector. The initiative will address consumers desire to verify the source, quality, and safety of domestic, imported or exported food, and help to maintain existing Canadian agricultural product markets, while opening access to new markets.

A graduate of the University of Manitoba (BA, 1974), John serves on the Board of the Canadian Manufacturers and Exporters (CME) Manitoba Division, and the Natural Sciences and Engineering Research Council (NSERC) Prairie Regional Advisory Committee.

**Mr. Curtis Rempel**  
Research Development Manager  
Richardson Centre for Functional Foods & Nutraceuticals

*Curtis* has a BSc and MSc from University of Manitoba and PhD and MBA from University of Guelph. Curtis worked as a research scientist for Agriculture and Agrifood Canada, with Monsanto Corp. in various roles including science, finance, marketing and business strategy & development, and for Meyers Norris & Penny – focusing on commodity marketing, renewable energy, intellectual property protection and enterprise software applications. Curtis is currently an Adjunct Professor and Research & Development Manager, Richardson Centre for Functional Foods & Nutraceuticals, at the University of Manitoba. Curtis also has a farming enterprise in Southern Manitoba. His current research interests include development of “green” technologies for extraction of plant and dairy bioactives, characterization of anti-inflammatory bioactives from pulse crops, berry pomice, cereals, dairy whey, and boreal medicinal plants, and food, beverage, and nutraceutical product formulation using these bioactives.

**Mr. Dwayne Lee**  
Marketing Manager, USA  
Canadian Wheat Board

*Dwayne* began his ag career working in Saskatchewan Wheat Pool's country elevator system. Soon after finishing a masters degree in ag economics at the University of Saskatchewan, Dwayne started with the Canadian Wheat Board as a market analyst responsible for putting together the global supply and demand picture and doing the wheat price forecasting. In 2005 Dwayne became a marketing manager for the Board in charge of wheat and durum sales to the U.S. market. In this capacity he works to coordinate all parties of the supply chain
from the elevator to the end user to execute sales in a timely and efficient manner.

**Dr. Ed Tyrchniewicz**  
**Senior Scholar**  
**University of Manitoba**

Trained as an Agricultural Economist (PhD – Purdue University), **Ed** has worked in Universities for more than 40 years with 25 of those years being in various academic administrative positions. While at the University of Manitoba ((1967-88), he was a Professor of Agricultural Economics, Head of the Department of Agricultural Economics, and Founding Director of the Transport Institute. He then served as Dean of the Faculty of Agriculture and Forestry at the University of Alberta (1988-96).

Since taking early retirement from the University of Alberta in 1997, he has held a variety of appointments, including Senior Fellow at the International Institute for Sustainable Development (1996-99), founding Executive Director of the Manitoba Rural Adaptation Council (1997), and Adjunct Professor (Agricultural Economics) at the University of Manitoba from 1998 to 2004. He joined the Asper School of Business in 2003, and served as the first Head of the Department of Supply Chain Management. He served as Associate Dean of the Asper School of Business at the University of Manitoba until June 2008. **Ed** has been appointed a Senior Scholar in the Department of Agribusiness at the University of Manitoba in July 2008. He is also a Senior Associate with Tyrchniewicz Consulting Inc.
14th Annual Fields on Wheels Conference
December 2, 2009

Speakers (in order of appearance)

Barry E. Prentice  Transport Institute
Paul D. Larson  Transport Institute
Mark Hemmes  Quorum Corporation
Ted Eastley  Manitoba Rural Adaptation Council
Mark Griggs  Port Metro Vancouver
Murray Hamilton  Canadian Pacific Railway
Peter Ladouceur  CN
Alberto Velasco-Acosta  CentrePort Canada
Ruth Sol  WESTAC
John Graham  IBM Canada Ltd.
Curtis Rempel  Richardson Centre for Functional Foods and Nutraceuticals
Dwayne Lee  Canadian Wheat Board
Brian Parteno  Maple Leaf Foods
Ed Tyrchniewicz  University of Manitoba

Participants (in alphabetical order)

Katia Arrus  Manitoba Agriculture, Food & Rural Initiatives
Pat Atkinson  Transport Canada
Diego Beltran  Protegra
Tim Brown  Manitoba Infrastructure & Transportation
Carolyn Campbell  Agriculture & Agri-Food Canada
David Chan  Transport Canada
Timothy Chapman  Agriculture & Agri-Food Canada
Ian Craven  Meyers Norris Penny
Richard Danis  Manitoba Infrastructure & Transportation
Gwendolyn Donohoe  Manitoba Rural Adaptation Council
Charray Dutka  Canadian Wheat Board
Paul Earl  University of Manitoba
Allan Foran  Aikins, MacAulay & Thorvalson LLP
Arturo Gardeweg  Manitoba Trade & Investment
Nathan Gerelus  Canadian Grain Commission
Darryl Gershman  G2 Logistics
John Harper  Western Economic Diversification
James Hayward  Agriculture & Agri-Food Canada
David Hope  University of Guelph
Jayne Kjaldgaard  
Jake Kosior  
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Manitoba Infrastructure & Transportation  

Laura Langford  
Carla Lavergne  
Chantel Loftus  
Canadian Wheat Board  
Parrish & Heimbecker  
Canadian Pacific Railway  

Helena Marak  
Matthew Morris  
Manitoba Rural Adaptation Council  
University of Manitoba  

Ken Nakagawa  
David Nyznyk  
Agriculture & Agri-Food Canada  
Agri-Food Central Ltd.  

Rod Richard  
Transport Canada  

Sherry Sauve  
John Spacek  
Rick Steinke  
Kevin Sumner  
Agriculture & Agri-Food Canada  
Manitoba Infrastructure & Transportation  
Canadian Wheat Board  
Manitoba Agriculture, Food & Rural Initiatives  

Siobhan Vandekeere  
Brent Vankoughnet  
Erica Vido  
University of Manitoba  
Port Metro Vancouver  
Manitoba Infrastructure & Transportation  

Harvie Wachter  
Steve Whitty  
Michael Wood  
SRY Rail Link  
Central Manitoba Railway  
Manitoba Infrastructure & Transportation  

Dina Zhou  
Ningbo University, China
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Staff

Kathy Chmelnytzki
Maria Clara Arnone Scimeca
Al Phillips
Doug Duncan
Nurik Nurmagambetov
Adam van Schijndel
Jairo Viafara
Stephen Wright
present

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