

INTRODUCTION TO ISSUES AT THE CTRF 2011 CONFERENCE

Over the course of history, inventions and innovations in transportation have changed man's accessibility to various parts of the globe. This has not only enabled individuals from one corner of the globe to travel and trade with individuals from another corner of the globe but has dramatically changed how we travel and trade. Innovation in transportation has not only enabled various modes to become more efficient but has also lowered the cost to travellers, shippers and consumers which ultimately affects how much one can travel and trade. How much one can trade is important in countries such as Canada. Our future growth and prosperity depends on it. Innovation in transportation also affects internal trade and network. Are we encouraging innovation, in line with changing objectives such as reducing emissions, introducing more efficient vehicles and giving an effect to government policies? Are we devoting sufficient resources and attention to encouraging innovation? Therefore the basic theme of the 2011 Conference is *Transportation and Innovation: the Roles of Governments, Industry and Academia*.

Innovation in transportation has become a major focus of attention not only in Canada but also in other countries such as Europe. It was the focus of the International Transport Forum in Europe in 2010 and holds the key to mobility of the future together with finding solutions that often calls for thinking outside the box. Beyond the main conference theme, provoking panel and research sessions will examine emerging issues and trends in various areas of transportation.

Organization of the Proceedings and An Overview of Individual Papers

The papers in this proceedings are organized under **eighteen** sessions. Freight Logistics; Trucking Industry; Innovation - Theory and Practice; Risk and Security; Grain Transportation; Transportation Modelling and Data; Port Issues; Economics and Innovation; Urban Issues; Rail Freight; Road Pricing and Regulation; Maritime Issues I; Roads and Safety; Passenger Transportation; Environmental Issues; Maritime Issues II; Gateways; Economics and Air Transport.

1.1 Freight Logistics

Logistics and Order Fulfillment Strategies for Online Grocery Retailing - What are the key determinants of long-term success for an online grocer - order fulfillment? This paper attempts to analyze the successes and shortcomings of what appear to be the key determinant. When this new way to grocery shop became possible, optimistic business pioneers everywhere sought venture capital to test the idea that consumers would actually purchase their groceries on the Internet. The online grocery market seems to be in its growth phase. Growing Internet use and access as well as consumer realization of the convenience of shopping online has given the online grocery market a continual boost.

Conséquences logistiques du Marketing électronique - Le développement de l'internet a constitué une révolution dans le domaine du Marketing. Parmi les principaux effets de ce nouvel outil de communication, il y'a d'abord la possibilité d'échanger avec une clientèle géographiquement très éparpillée. Le présent article propose d'identifier les conséquences

logistiques du marketing électronique.

1.2 Trucking Industry

Going the Distance: Trends in the Canadian Trucking Industry since 2004 - Are there any recent new trends in Canadian Trucking? The author sheds light on this matter by examining key trends in the Canadian trucking industry from 2004 to 2009, as shown by Statistics Canada's Trucking Commodity Origin and Destination (TCOD) survey data. It includes a comparison of movements within Canada and abroad, local and long distance trips, and shipments within and between large urban centres.

Trucking in Canada Before and After Deregulation - Current Issues Facing the Industry Has trucking changed since deregulation? The author presents an overview of highway transportation, the pre and post deregulation situations. Finally, the major trends in trucking are described together with some of the current problems and proposed strategies for dealing with them.

1.3 Innovation - Theory and Practice

Opportunities and Challenges for Innovation in the Transport Sector - Do you question the importance of Innovation to the Transport Sector? To show that it is, it is now key to Transport Canada's forward-looking plan to improve transportation efficiency, environmental performance, safety, and security. Transport Canada conducted a sector-level assessment, including cross-country consultations with key stakeholders to gain an understanding of the issues facing the transportation sector, to identify the drivers and barriers to innovation and the opportunities and challenges to improve sector performance. The authors of this paper present the results of the consultations, and an analysis of the key themes as they pertain to fostering innovation in the sector.

Transport Canada and its Complex Regulation-Innovation Nexus: Implications for Future Innovation and Regulatory Strategies - Is Transport Canada the appropriate regulatory body to foster innovation? The author examines the nature of Transport Canada as a regulatory body facing diverse notions about what innovation is or should be and also the choices among diverse regulatory instruments and instrument-mixes to achieve innovation. He develops an empirical and conceptual account of Transport Canada as a regulatory body.

1.4 Risk and Security

Assessing Risk and Resilience for Transportation Infrastructure in Canada - Does risk assessment have any merit? The authors indicate that it seeks to identify which events pose the greatest risk and which parts of the transportation system are most vulnerable. In this paper, they describe the basic concepts underlying risk assessment are defined with particular emphasis on the concept of resilience – the ability to “bounce back” from major disruptions. The assessment of economic loss from disruptions is reviewed with an illustration. Methods for identifying critical links in a transportation network are reviewed and a new metric is introduced to identify those links that provide critical redundancy (and therefore resilience) for the network. Finally the basic requirements and structure are introduced for an economy-wide model for assessing risk and resilience for transportation

systems.

Ports and Shipping Security - Is port and shipping security important? The author shows why it is and indicates that Canada's maritime and ports industry have taken significant steps to enhance the security of the country's trade. Many of these security programs have complemented those in the US. The author maintains that despite these many advances, more needs to be done to enhance ports and marine security without hampering the flow of trade. In addition, funding is also needed in Canada to ensure that we remain competitive with the US.

Pratiques organisationnelles de sécurité mises en place par les transporteurs de matières dangereuses : analyse des résultats d'une enquête réalisée au Québec - Dans cette étude, nous présentons ici un outil d'aide à la décision pour le choix des transporteurs de matières dangereuses (MD) basé sur le risque et les pratiques organisationnelles de sécurité (POS), qui s'appuie sur les résultats de l'enquête auprès des transporteurs. Cette enquête auprès de l'ensemble des transporteurs routiers de MD au Québec (1450 transporteurs) est innovante puisqu'elle couvre à la fois des éléments techniques (classe de MD, pratique de chargement/déchargement, etc.) et des éléments organisationnels (formation, maîtrise du risque, sélection des sous-traitants, TIC, etc).

Port Risk Management Strategy - Is port risk management useful? The authors in this paper describe the results of a survey of port and ship management personnel who provided a practical framework for the design of a management strategy to classify ports on the basis of risk categories - a risk assessment procedure. This risk assessment procedure extracts the greatest benefit from the existing infrastructure and resources of Canadian ports. It can be applied in all Canadian ports and indeed in any port worldwide. The resulting risk classification will facilitate quick and effective decision-making when a request for refuge is received from a ship in need of assistance.

1.5 Grain Transportation

Shipper Incentives to Invest in Infrastructure and Operations - When considering whether to incur significantly increased labour or infrastructure costs, shippers, terminals and others must consider whether the perceived benefits will flow from their investment, and to which parties those benefits will accrue. The authors show that a variety of incentives to shippers of different sizes might provide the requisite assurance for them to invest in carrier infrastructure and operations, including decreased freight rates over a defined period of time, efficiency gain sharing, or rail carrier financial contribution to incremental labour or capital costs. In this regard, the experience of the grain handling and transportation system is instructive.

Grain Transportation in Canada Deregulation - The transportation of grain in Canada is deeply rooted in politics, regulation and conflict between western grain shippers and the railways. The problems began before the turn of the nineteenth century and continues today. This paper reviews the regulatory developments that have occurred in grain as they relate to wheat after the period 1995.

1.6 Transportation Modelling and Data

New Data Products for the For-Hire Truck Transportation Industry - To better measure the for-hire truck transportation industry, Statistics Canada has developed and launched two new types of data. First, the new Quarterly Trucking Survey (QTS) replaces the old Quarterly Motor Carriers of Freight Survey (QMCF). The QTS has improved coverage and better quality due to streamlining data needs and lowering respondent burden. Second, the For-Hire Motor Carrier Freight Services Price Index is a new data series and is part of the Services Producer Price Index program at Statistics Canada. The authors describe both new data products together with a brief analysis using the new information.

Measuring Freight Production - The measurement of freight production has limitations. The authors provide an analysis of how freight transportation production is measured, some key limitations of traditional approaches and potential innovative solutions to address the main concerns. They suggest measuring distance using the great circle between the origin and the destination instead of traveled distance and also suggest a volume-distance measure of production (such as TEU-km) in particular for the general cargo segment of freight.

1.7 Port Issues

Issues in Port Policy: A Look Back to Look Forward - Do data bases teach us anything? The authors show us how by first creating a database of port papers from 1950 to 2000. Then by combining this with the database of port papers created by PortEconomics between 1997 and 2008, the authors present here a bibliographic analysis of both sets of literature, focusing on the contributions of Canadians to the port policy and management fields, and looking for themes of research in the 1950-2008 period as well as any lessons for those who might be contemplating the future of ports in Canada.

Port Labour-Management: Need for "Revolutionary" Change - Should port labour-management change? The author shows that there is a real need for a revolutionary change in labour-management to bring it into the 21st century and to improve productivity, given little change in labour-management relations over the past. We need change as the quality of Canada's longshore forces is essential to ensure our continued competitiveness to meet the challenges of our increasingly integrated global economy. The author examines how this can be done.

1.8 Roads and Safety

The effects of weather on driver - behaviour - Does weather have an effect on driver behaviour? This study, using Vehicle Monitoring Technology (VMT), quantifies the extent to which weather, particularly ambient air temperatures, influence the incidences and duration of engine idling times across a snow resort fleet. The main objective of the study was to assess the relationship between weather and driver behaviour amongst snow resort fleet vehicles. The results reveal variable frequencies of hard accelerations and decelerations, as well as high levels of idling, both of which greatly reduce fuel efficiency.

Innovative use of a corporate survey tool for public consultation for the sustainable rural

roads master plan for Strathcona County, Alberta - In this paper, the authors describe the methodology and results of the innovative and successful use of the on-line SurveyMonkey survey software (that EBA Engineering Consultants Ltd. Human Resources Division normally utilizes for internal staff surveys) for obtaining meaningful input from the County's rural residents regarding the county's future policies regarding its rural roads. They then describe their results.

1.9 Economics and Innovation

Parcel Tanker Transportation in Canada - Have you heard about parcel tanker transportation by ship? It is not new it dates back to 1886. In this paper, the authors examine this industry, the regulations, the investigations in the United States, European Commission and Canada and suggests a possible theory for the above investigations.

Analyzing Engine Idling Reduction Opportunities among ski resort fleets using on-board vehicle data loggers - By demonstrating the utility of in-vehicle monitoring technology, the authors in their paper emphasizes the potential for reducing CO₂ emissions that are generated by the operation of a ski resort fleet. The main objective of the study was to acquire baseline data on driver behaviour amongst the fleet vehicles in order to improve fuel efficiency through the adoption of eco-driving practices. Their results reveal high levels of hard accelerations and decelerations, greatly reducing fuel efficiency.

1.10 Urban Issues

Economics of Central Business District Parking - Can we ignore central business district parking? The author shows why we cannot and that parking in central business districts is of considerable importance for sustainable transportation policy in terms of modal choice relative to transit use. The author examines data for parking supply, demand and pricing. In addition, interviews with municipal parking official were conducted. The results of his paper suggest that *parking price* is important in influencing transit ridership. However, the importance of pricing policy is not yet accepted by politicians and the public.

Calibration of the Toronto Waterfront Microsimulation Network with OD updating - The authors in this paper discuss the calibration of a large scale microscopic traffic simulation for the downtown Toronto waterfront area for 2009 conditions. It is part of a larger project to simulate driving cycles and to estimate emissions using microscopic emission models. One contribution of their study is integrating microscopic/macroscopic demand estimation with the microscopic network calibration.

Congestion Pricing in Canada: Data and Methodology Issues - Major methodological issues cloud the debate on road congestion costs. The authors present the basic economic concepts with regards to congestion measurement; evaluate the data and methodology strengths and limitations of the most recent congestion study funded by Transport Canada; and reviews the literature on selective congestion cost estimates in the GTHA, the United States, and in Europe.

1.11 Rail Freight

Transportation Policy, Competition and Economic Growth - Is rail competition important? The authors show that the maximum efficiency of rail carrier freight services is best achieved by inter-modal and intra-modal competition. The authors discuss rail rates and service levels in captive shipper environments in Canada. They conclude that exposure to increased levels of competition is needed to achieve the efficiencies and that increased intra-modal competition in particular is preferable.

Potential social benefits of freight modal shift programs in Canada - Are there any social benefits of freight modal shifts? This study focuses specifically on truck-to-rail modal shift. First, the authors briefly illustrate the need for such programs in Canada. They then proceed to describe a few existing modal shift programs. Then, using recent data from Transport Canada's Full Cost Investigation, they attempt to estimate the environmental, social and economic advantages of shifting freight from truck to rail. Finally, they employ these estimates to construct a framework for a national modal shift program in Canada with an example describing how such a program would work in practice.

Implementing a Virtual Container Yard to the Vaughan CP Intermodal Yard - Is there a solution to the transportation of empty containers? The authors examine this problem in the case of movements between terminals. Transportation of empty containers by trucks moving to and from container terminals is a source of inefficiency in intermodal freight transportation. Reducing unnecessary movement of empty containers could help improve efficiency. The authors in this paper, the Virtual Container Yard concept (an Internet based system for minimizing unnecessary container travel), was applied to the Vaughan CP intermodal terminal and analyzed to demonstrate the potential effect on vehicle kilometers travelled. This study finds that using the above concept could reduce empty container movements.

1.12 Maritime Issues I

Places of Refuge: Ports Suitability - Are there places of refuge for ships? The authors in this paper, in determining suitable places of refuge consider Canada's geography, international treaty obligations, environmental protection, alternatives to ports as places of refuge, existing ports, risk assessment and risk based classification of ports.

Marine Towing Operations in Canada - Are changes occurring in the ownership of marine towing operation in Canada? The author describes what has happened. He begins by first describing the structure of the industry, showing that it accounts for a small but noticeable proportion of water transport revenue in Canada. He indicates that ownership has changed from the timber days in the nineteenth century to the offshore drilling days of the twenty-first century. How consolidation in this industry in Canada occurred is described together with the domination by international players that has raised antitrust concerns.

Implications of Environmental Regulations for Shipping and Ports - Do environmental regulations have an impact? The author examines the impact of environmental regulations

on the shipping industry, at sea and in port. The oceangoing shipping-port complex threatens the environment and human health is clear, and steps to mitigate these problems come from many directions. The danger is that the regulatory regime will be fragmented with negative effects on the shipping industry.

1.13 Road Pricing and Regulation

Cost Recovery from Road Tolls with Long-Run Uncertainty - Should there be cost recovery from road tolls? The authors assesses the degree to which **actual** present-value lifetime revenues can differ from **actual** construction costs. Several sources of uncertainty are considered: construction costs, initial traffic demand, growth rate in demand, price elasticity of demand, flexibility in road capacity, and the rate of technological change in vehicle size and safety. The effects on cost recovery of errors in estimating key demand and cost parameters are derived analytically. A probability distribution for lifetime cost recovery when the road is built without error is also computed numerically.

Pareto-Improving Congestion Pricing and Revenue Refunding with Elastic Demand - Adopting an analytical modeling approach, this study investigates Pareto-improving congestion pricing and revenue refunding schemes in a general network with elastic trip demand, which make every road user better off as compared to the situation without congestion pricing.

Using dynamic performance measures in regulating heavy vehicle weight and dimension limits - The experience in Ontario - In the late 1990s, Ontario initiated a profound reform of its Vehicle and Weight Dimension regulations aimed at introducing Safe, Productive, Infrastructure-Friendly (SPIF) vehicles. It has to date completed the first three of its four phases. In this paper the author describes, phase four, the approach and procedures used by the Ontario Ministry of Transportation (MTO) to consider vehicle dynamic performance measures as one of the basic principles guiding the design of weight and dimension regulations for the new proposed SPIF truck and truck-trailer combinations.

1.14 Gateways

Asia-Pacific Gateway and Corridor: Economic Expansion Potential and Risks to Expansion - Are there risks to trade expansion through the Gateways? The author has undertaken a study for CN to document: (1) the importance of the Asia-Pacific Gateway and Corridor (APGC); (2) the economic expansion potential related to the APGC and its economic impact; and (3) the possible risks to this economic expansion potential. Examining the overall trade and key commodities moving via the APGC shows its importance, especially as a conduit for exports. He identifies several risks that could threaten the expansion and indicates that federal government planning is needed along two lines.

Expansion of Asia-Pacific Infrastructure for Bulk versus Container traffic - Have we in the past been investing more in the infrastructure of one type of cargo versus another? The authors in this paper examine the extent to which investment in container marine and transportation infrastructure is favoured over investment in bulk marine and transportation

infrastructure. They examine the underlying reasons for the bias and the negative effects that this could have on the Canadian economy.

1.15 Passenger Transportation

Rural Impacts of High Speed Rail and Strategies for Mitigating Impacts - Does high speed rail have an impact on rural communities? In this paper, the author provides an overview of the key impacts of High Speed Rail on rural communities. Four broad categories of impacts are discussed: road-user impacts; commercial and economic impacts; social and environmental impacts; and administrative and planning impacts. It provides a summary of measures for addressing identified impacts as well as the importance of clear communication between project proponents and rural stakeholders to minimize misunderstandings and head off problems before they lead to project delays and cost overruns.

Evaluation of Commute Efficiency: Design and Simulation of Future Urban Form Scenarios in Windsor, Ontario (2011 - 2031) - In this paper, different urban form scenarios pertaining to various spatial distributions of worker's place of residence and place of work is simulated and evaluated by the authors. Their evaluation focuses on commuting patterns, transportation system usage and performance, and sustainable indicators for the Census Metropolitan Area (CMA) of Windsor, over the time period 2011 to 2031. Their analysis attempts to determine the most sustainable and least sustainable urban form growth patterns, in order to guide the land use and transportation planning process in this Canadian city.

1.16 Environmental Issues

Visions of the Future: Lessons from Sustainable Transportation Thought Leaders - Trucking is responsible for a substantial portion of harmful emissions. Given its huge impact on prosperity, mobility and sustainability, the lack of academic literature on "green" trucking is astonishing. The author combines literature on green trucking with insights gathered from several speeches. His study includes a look at various challenges and opportunities for the trucking industry in enhancing sustainable supply chains in Canada, along with some recommendations and a research agenda to support more sustainable trucking.

Integration of Green Initiatives in the Trucking Industry: An Evolutionary Perspective - Are green initiatives ignored by the trucking industry? The authors show that many trucking companies are finding it necessary to strategically integrate green practices for their survival and growth. Integrating green practices can not only address these concerns but also provide a cost advantage and increase industry competitiveness. The authors therefore proposes the evolutionary model for the adoption of green practices and Bison Transport is used to demonstrate the effectiveness of the model.

1.17 Maritime Issues II

Navigating the Eddies in the Maritime Leisure Transport Sector in BC - In maritime leisure cruise ships, passenger ferries and large yacht destination travel are the main methods of satisfying consumer demand. Service providers are also a critical element in

leisure experiences, this paper will use elements from Miller and Kim's (2004) work to shed light on the behaviour of port and government tourism officials in the supply-side discussion. The elements requiring consideration include connectivity, hospitality, marketing, infrastructure and environmental sustainability issues.

Industry Structure and Competition Law in Harbour Towing - In 2008, existing and potential container line customers at the port of Prince Rupert expressed concern that the charges for assist tugs in Prince Rupert exceeded that at other West Coast ports by a considerable margin. This paper highlights the results of a study undertaken for the Port of Prince Rupert to investigate the causes of high tug costs and evaluate options for reducing costs, including the potential for tendering of an exclusive contract by the Port. To estimate the impact of these variables on actual prices, a regression analysis was carried out for major West Coast ports and Prince Rupert.

Changing Currents in the Canadian Ferry Transport Sector - Ferry transportation in many parts of the world has attracted a great deal of attention. The authors identify and analyze some of the innovative developments in ferry transportation in Canada. They provide their opinion on the relative success of the major changes in ferry transportation policy and offer recommendations.

1.18 Economics and Air Transport

The Benefits of Transportation - Externalities were not given thought in transport infrastructure investment in the past because these were borne by society with the investment viewed as progress by the employment generated. Today, any investment - public or private - must meet rigorous tests that include previously ignored externalities. The authors study (commissioned) reveals that the literature revealed inconsistencies in how benefits and costs are treated across jurisdictions, and largely stems from societal valuation of each item. As the General Equilibrium model continues to evolve and previously elusive intangible externalities will become quantified.

Freight Transportation in Alaska: An Economic "Tipping Point" - In this paper, the author discusses the components within Alaska's transportation and trade sectors which, when looked at holistically, have the potential to generate an economic "tipping point" for the state. The components of the proposed "tipping point" involve enhancing the marketing of the foreign trade zone in Anchorage as well as pursuing two modal initiatives. These initiatives involve a third phase: liberalizing air cargo; and leveraging the expanding capacity at the Port of Anchorage.

World Air Cargo: Competition, Collusion and Competitive Concerns - Air Cargo tends to be at the forefront of increased liberalization of air services. The authors focus on competition, collusion and competitive concerns in the air cargo industry. The world air cargo market is reviewed together with the results of the investigations into the collusion. Finally, the competitive issues facing the industry are examined.