The Use of Containers in Canada

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ABSTRACT

This article describes the flow and use of containers and is based on a study commissioned to identify state of play, major issues and recommended areas for further research.

This article addresses the existing context, and provides a thorough understanding and description of container movements and logistics in Western Canada, in particular, as well as in Central Canada and the Atlantic Region. The article also provides several illustrations of best practices in similar situations in Canada and around the globe.
Prince Rupert: Gateway to the Twin Cities and the Potential Value Added Intermodal Freight Service

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ABSTRACT

A new Canadian container port being developed in Prince Rupert, British Columbia opens a new intermodal freight corridor operated by the Canadian National Railroad (CN) to serve the Midwest United States for trade with East Asian countries. This paper particularly explores new potential intermodal services to the Twin Cities region. The new Prince Rupert route has potential to serve the Twin Cities through two gateways; Chicago, Illinois and the Twin Ports of Duluth, Minnesota and Superior, Wisconsin. The advantages and disadvantages of using each gateway are discussed. The paper examines on both routes the issues of: transit time, terminal availability, drayage, corridor congestion, asset utilization, interest inventory costs, freight rates, growth potential, circuitry and transloading. It provides a basis for more studies in the future on this new freight corridor of significant economic values.
Lean thinking has been popularized by the success of the Toyota Motor Company (Womack and Jones, 2003). Taiichi Ohno (1912-1990) originated a unique way of improving efficiency based on the identification of muda, or waste. Much in the way that engineers discovered that the strength of materials depended on cracks, lean thinking revealed why some supply chains are weaker than others. The key insight of lean thinking is to focus on the identification and elimination of waste. As soon as waste is eliminated, the supply chain grows more efficient and is likely to be more environmentally sustainable and robust.

The transport of empty international containers is a supply chain waste. Empty moves consume railway and port system capacity and generate greenhouse gas (GHG) emissions. Customs regulations that govern the repositioning of containers within Canada require containers to move empty except under some strict conditions. The waste created by the repositioning of two empty containers in opposite directions is the equivalent capacity of one full round trip.

Canada Customs regulations of international containers permit one incidental move of domestic freight en route to an export port. No backtracking off this route is allowed between domestic points. Speculative moves of empty containers are also prohibited.

This paper examines the impact of adopting a more permissive cabotage regime on the movement of international containers in domestic service. The discussion begins with the presentation of an economic framework and the method of analysis. Subsequently, three cases are presented to illustrate the environmental and economic impact of a liberalized cabotage regime.
In this paper, alternative schedule proposals for a European airline hub are compared. The analysis mainly focuses on the measure of hub timetable co-ordination and connectivity levels, which are evaluated by means of the “weighted connectivity ratio”.

The case study demonstrates how even relatively small hub can offer a huge number of connections, by achieving a satisfactory temporal co-ordination level. Furthermore, the results of the application of specialised software, which has been used for simulating the interaction between air transport demand and supply, seem to confirm that changes in the hub timetable co-ordination level can produce a strong impact on the profitability of the airline network as a whole.
L’arrivée Des Transporteurs À Faibles Coûts : La Réaction Des Transporteurs Existant En Terme De Capacité Aérienne Au Canada

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ABSTRACT

L’industrie de l’aviation canadienne a subi de nombreux changements et chocs externes dans la dernière décennie. Nous pouvons mentionner, par exemple, l’Accord « Ciel ouvert » entre le Canada et les États-Unis, la fusion entre Air Canada et Canadien, la multiplication des transporteurs à faibles coûts au sein des marchés intérieurs, les événements du 11 septembre 2001 aux États-Unis, la guerre en Irak, qui ont eu d’importantes répercussions sur l’industrie. L’industrie de l’aviation canadienne a réagi à ces événements en adaptant son service face à ce nouvel environnement. La capacité aérienne en nombre de vols et de sièges a évolué durant ces années. Il a été possible d’observer dans les dix dernières années un accroissement dans le nombre de vols au Canada ainsi qu’une baisse dans le nombre de sièges offerts. L’arrivée des transporteurs à faibles coûts au sein des marchés intérieurs a souvent été mentionnée comme étant un événement important ayant eu un impact sur le service aérien au Canada.

L’analyse proposée s’intéresse principalement à la question suivante : comment les transporteurs existants ont-ils réagi à l’arrivée des transporteurs à faibles coûts en terme de capacité aérienne au Canada ?
ABSTRACT

Transport Canada, with the participation of the provincial ministries responsible for transportation, is completing a three-year project called the Full Cost Investigation (FCI) of transportation in Canada. The FCI includes both the financial and social costs of transportation activities. Climate change is one of the five social costs included in the FCI, along with accidents, delays due to road congestion, air pollution, and noise. Transportation activities emit a significant amount of greenhouse gases in Canada. The estimation of greenhouse gases emission costs involves numerous challenges.

This paper summarizes the methodology adopted to complete the assessment of the cost of greenhouse gas emissions from the transportation sector in the year 2000. The rationale behind the retained unit costs; the quantification of the emissions as well as the allocation of the total costs by activities retained for the FCI are presented. Annual costs are estimated between C$3 B and C$6 B for the 158 millions of tonnes of CO₂ equivalent emitted by the transportation sectors for the year 2000 in Canada.
Since the early 1960s, the dominance of the private car as a mode of passenger transportation has shaped urban form in North America. Research has shed light on the relationship between urban form and travel behavior and has revealed several ways in which the interaction between land uses and transportation networks affect mode choice. The smart growth movement is based on the assumption that urban development planning policy may have a significant impact on daily travel patterns and modal shares. The City of Hamilton, embracing these ideas, plans to implement a twenty-five year urban development plan in an attempt to reduce private automobile dependency and to favor the use of public transit.

Research described in this paper examines the future implications of this plan on the modal shares in Hamilton CMA. Using IMULATE, an integrated urban transportation and land use model, we develop scenarios to estimate future modal shares under the effect of the policies proposed by the plan. In particular, we examine the impact on transit ridership for a variety of scenarios that combine different levels of compact land uses with enhancements to the transit’s level of service. The findings of the study suggest that single policies by themselves may have minimal impact on transit usage, while a combination of policies may yield more significant results in the desired direction. In all cases, when it comes to the trip to work the private automobile remains by far the dominant mode of transport.
Studies conducted throughout the industrialized world have informed our understanding of the various built environment and transit service characteristics that influence commuters’ ability and willingness to use public transit. However, little such research has been conducted in Canada, thus limiting our ability to ensure that efforts to promote public transit commuting in Canadian municipalities are properly suited to the potentially unique needs and demands of workers residing in those places.

This paper presents the results of a survey conducted in the City of Ottawa that examined attitudes toward public transit commuting from the perspectives of workers who currently travel by car and those who already use public transit. Although this small-sample survey was conducted as part of a larger study without the intention of drawing broad generalizations from the data collected, the results suggest several important directions for future research concerning the built environment and transit service characteristics that matter to Canadian commuters. The results also suggest that transportation researchers should consider using qualitative research methods more extensively when seeking to better understand this issue.
Public Transit Productivity

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ABSTRACT

This paper analyzes total factor productivity (TFP) in public transit systems using panel data for 24 US transit systems and 13 years of data. It estimates a production function and input demand equations jointly to obtain the coefficients needed to decompose TFP among its sources. It finds that the factors that contribute to TFP growth are network expansion, fleet age, reductions in operating subsidies, increases in capital subsidies and technical change. Additionally, it finds that decreases in average bus speed reduce TFP and private sector involvement in providing transit services does not affect total factor productivity in these systems.
ABSTRACT

To foster increased opportunity for northern residents, the Aboriginal Economic Development Division of Indian and Northern Affairs Canada (AEDD) sponsored research aimed at enhancing road transportation of mineral concentrates from mine sites to ports, railheads or processing destinations. Particular focus of these investigations were the requirements for truck transportation at distances over 200 miles, and where this transport is complicated by severe physical, climatic and/or seasonal limitations.

The investigations reviewed the state of industry practice as relates to short and long hauling distance, route infrastructure conditions, equipment commonly used, creation of backhaul transportation efficiencies, loading/unloading and transfer systems, problematic seasonal situations (winter roads, spring thaw, etc.), and volume thresholds for economically justifying upgrades to route infrastructure.

Findings were incorporated into an activity based fleet requirements and costing model that permits strategic comparison of the relative efficiency and scope of optional elements such as route infrastructure, where drivers are based, higher payload/GVW units, special 2-way hauling configurations, and stacking equipment for empty return.

It is hoped that this model will facilitate the adoption of best transportation practices for emerging minerals projects and thereby enhance project viability.
The minerals sector in Saudi Arabia is one of the economic activities which has already started to achieve the strategic goal of economic diversification away from oil activities as the main source of national income. Although, Saudi Arabian soil has a large variety of metallic and non-metallic minerals that range in size and value occurrences of limited potential to deposits large enough to sustain profitable exploitation. However, the considerable attention has been paid to the large reserves of strategic minerals that have been found such as, phosphate and bauxite. Therefore, an exploitation of these minerals requires a high demand for transportation infrastructure, the provision of which has become a necessity.

The number of roads and ports has increased to satisfy this demand and also the railway network has expanded. The development of transportation infrastructure plays an important role in the economic development of a country, and therefore a critical issue for most mining projects in remote areas is the extent to which the costs of the required infrastructure facilities, including transportation, are shared or allocated to the mining project alone. This affects the profitability of mining projects considerably. This paper examines the ability of transportation infrastructure to contribute to exploitation of minerals in Saudi Arabia.
An X-Prize for Transport Airships

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ABSTRACT

What if it were possible to pick up almost anything and transport it almost anywhere? What if goods could be flown over land or sea at the lowest energy costs and the least environmental impact? How would that change the world? Domestic and international commerce would no longer be constrained by geography or ground transport infrastructures. The impoverished and land locked regions of the world could be directly linked with the most advanced economies. Conventional transportation infrastructures could be supplemented or even by passed in favor of this new transportation system.

About once every 40 years since the Industrial Revolution, a new innovation in transportation technology has emerged to change the world economy. Steam ships and railways characterized the 19th Century; trucks, airplanes and intermodal containers characterized the 20th Century. This paper will discuss the most promising technological advance for the 21st Century; a new generation of transport airships. The challenge for airship technology is no longer technical. The materials exist to build reliable, robust airships. New aero-engineering designs and advanced weather forecasting models are able to nearly eliminate safety concerns. Vectorable engines and computer avionics are available to provide superior control of large airships. The principal hurdle today is the lack of business confidence and policy direction to support investment in a technology that outmoded thinking holds as being dangerous and uneconomic.

Shippers are eager to explore the utility of heavy lift airships; however, they are reluctant to provide the initial development funds needed to construct operational prototypes. A conclusive demonstration is necessary to prove that a practical heavy lift airship vehicle can be constructed and operated. One or more airship development teams are needed that have the expertise and resources to design, develop, manufacture, deploy, and support a Transport Airship fleet. An X-Prize for the design and development of the first successful Transport Airship prototype could meet this objective. An X-prize competition could energize the LTA community and the potential lead users to work together to bring this most unique and useful transportation system into being.
Freight transportation is of great importance to Canada and to Manitoba. The availability of vehicles and equipment, maintenance of infrastructure, and ease of crossing the border, are prime determinants of logistics costs and service. This paper explores seven beliefs from the transportation literature and the community of shippers. The study focuses on Manitoba-based shippers. Two research methods were used—a questionnaire mailed to a sample of Manitoba shippers and personal interviews with a smaller group of large shippers. A population of 3,505 firms was initially contacted by telephone. Questionnaires were mailed to 910 firms that agreed to participate. A 10.3 percent response rate was gained; 94 of 910 firms returned completed questionnaires. In addition, fifty of Manitoba’s largest shippers were invited for in-person interviews. Nineteen of them accepted, and were interviewed.

One interesting finding is that U.S. border delays appear less of an issue for Manitoba shippers than the literature would have us believe. Also, shippers’ knowledge about American border initiatives is rather limited, despite educational opportunities and government outreach on the topic. A third finding, on transportation service levels, finds motor carriers out-performing the railroads, in the eyes of shippers. Further, container availability does not appear to be a major issue for these shippers. The study suggests that use of intermediaries is quite situational, with greater usage by large shippers than small shippers. Finally, while shipment risk has decreased for large firms over the last five years, it has increased for small and medium sized firms.
ABSTRACT

Inclement weather is a serious concern for mobility. This problem is especially true for the movement of goods as the uncertainty related to weather events poses significant cost to the freight industry. This paper begins with an exploration of the potential areas of concern related to weather impacts on rail and trucking operations. For the trucking sector, determining the time delays and costs of these impacts has proven difficult. For example, the Highway Capacity Manual (2000) provides basic measurements for calculating weather related delay for road systems. However, a significant number of empirical studies, both before and after the publication of the Highway Capacity Manual (2000) provide further insights that may improve our understanding.

In this paper, we present a meta-analysis of these studies across North America to extract factors of travel delay due to weather conditions. The data is then contrasted with a detailed daily sample from several traffic and weather stations in British Columbia. The results present factors of delay for rain and snow that are useful for modeling travel times and determining the impact and cost of delay due to inclement weather. The results aid our understanding of the effects of weather on surface freight systems and form the basis for a larger study into the impacts of weather on surface freight systems in a changing global climate.
Session 2.2.3 Logistics and Supply Chain Management

A Comparative Study of the Cultural and Institutional Influences on Risk Management of Shippers in Quebec and Ontario

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ABSTRACT

Cultural and institutional factors are known to bear influence on the decision making of individuals. In the business world, managers in the public sector are known to be more risk-averse than their counterparts in the private sector. Furthermore, even within the same business sector or within the same firm, managers in different departments exhibit varying tolerance for risk.

This paper explores the risk tolerance of logistics managers in Ontario and Quebec as they evaluate risks in selecting the transport services for their shipments. Quebec’s unique cultural and legal heritage distinguishes it in Canada. The cultural and legal diversity in Ontario and Quebec is assumed to have an impact on the decision-making of individuals in their professional and personal lives.

Using the data from a stated preference survey of 390 logistics managers in Ontario and Quebec, we explore how managers cope with various types of risks in selecting transport modes for their shipments. The shippers were offered hypothetical choices (truck only, rail only, and intermodal) for their shipments where each choice posed a unique level of risk for damage, security, and delay. Based on the attributes of the choices, shippers opted for one alternative. This paper compares the risk averseness of shippers operating in Quebec and Ontario. The paper further compares the risk tolerance of shippers across different industry sectors and firm sizes.
ABSTRACT

The objective of this paper is to determine the relationships between board members’ involvement in prescribed activities of boards of directors and organizational performance in public transit organizations. It analyzes the degree to which board members are involved in prescribed activities of boards of directors as an indication of their effectiveness using self-rated survey responses. Then, it identifies public transit organizational performance measures from Section 15 sources and determines their relationships with board performance. The paper finds statistically significant positive relationships between board members’ involvement in a number of prescribed activities of boards of directors and measures of organizational performance. It, therefore, lends support to the call for the boards of directors of public sector organizations to take active stance to improve organizational performance.
The taxi and limousine industry is an important form of urban, intercity transportation in Canada providing essential services to segments of the population with modest means. Being a public service, it is not surprising that a limited amount of public regulation is necessary. But these regulations have over time extended from the sphere of safety to economic regulation having some undesirable effects.

The purpose of this paper is to examine the taxi and limousine industry in Canada. First, the structure of this industry in Canada is examined. Second, the economic regulation of this industry is briefly covered. Third, the recent regulatory developments of the industry in Canada are reviewed together the regulatory experience in other countries with arguments for or against deregulation. Finally, a few concluding remarks are made.
Session 2.3.3  Urban Transport Policy

The Opportunity Cost of Land Occupied by Transportation Infrastructure

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ABSTRACT

This paper utilizes, for the most part, research performed for a joint federal-provincial research effort, led by Transport Canada, into the full costs of transportation in Canada called the Full Cost Investigation (FCI) project. Costs associated with the construction and maintenance of transportation infrastructure and vehicles are generally readily-accepted in the realm of the costs of transportation. However, the costs associated with the use of the land occupied by transportation infrastructure are ostensibly less tangible and therefore have often not been the subject of as much discussion.

This paper summarizes the rationale for the inclusion of a cost of land use among transportation costs. The driver of this cost is the foregone opportunity of employing the land in an alternative use. Furthermore, some of the practical issues surrounding the calculation of the opportunity costs of land are discussed, as well as rough estimates of the scope of land costs relative to all other costs associated with transportation activity.
Two-vehicle crashes form about 55% of the reported accidents in Singapore and account for about 44% of traffic-related serious injuries and fatalities. However, there is no known study that examined the severity of two-vehicle crashes in Singapore. In this study, an attempt is made to identify the possible contributing factors related to severity of two-vehicle crashes. Based on reported accident from 1992 to 2000, the factors such as driver characteristics, vehicle types, crash characteristics, roadway features and environmental characteristics, are investigated using an ordered probit model.

The study shows that while overall crash severity has decreased with time, perhaps due to the general improvements in safety standards, there are other specific factors which are significantly associated with crash severity. The vehicle type, road type, collision type and time of day are found to be the important determinants of severity in two-vehicle crashes. Two-wheelers (motorcycles or bicycles) and heavy vehicles (trucks or buses) are associated with higher severity risks and so are foreign vehicles compared to local ones. Crashes on expressways and along horizontal curves also give rise to more severe crashes. Head-on collisions as well as night time crashes tend to result in more serious injuries.
ABSTRACT

Highway congestion, safety, and efficiency in freight movement on the highway systems are current issues that receive increasing attention. The growing need for more efficient freight movement while maintaining acceptable levels of safety on the highway system requires identification of innovative yet practical solutions. The concept of exclusive truck facilities (ETFs) is becoming an attractive option to transportation agencies as a feasible strategy in safety improvement, transportation system management (e.g., congestion mitigation at bottlenecks), improving access to freight facilities (e.g., ports, intermodal facilities, and regional distribution centers), and improving efficiency in freight movement along corridors of national importance. Implementation of ETFs, however, could involve high costs of construction, maintenance, and acquisition of additional right of way.

Based on the results of benefit-cost analysis of alternative ETF configurations under different traffic and site characteristics, a set of criteria is proposed for identifying suitable locations for exclusive truck lanes implementation. It is proposed that exclusive truck fatalities are economically feasible at locations with traffic volume of 100,000 vehicles per day or more and with a truck volume of at least 25 percent of the traffic. In addition, the rate of truck-involved fatal crashes and level of service should be used to prioritize preliminary candidate locations that satisfy the traffic criteria. Consideration should also be given to the existence of freight intermodal terminals, ports, processing centers as well as regional distribution centers in close proximity to freeways and interstate highways.
Lane-changing behavior models are important components of microscopic traffic simulation tools. Particularly, heterogeneity of traffic can significantly affect lane-changing behavior. The objective of this paper is to propose a framework for modeling of the lane-changing behavior in heterogeneous traffic scenario. The proposed model is built using the Adaptive Neuro-Fuzzy Interface System (ANFIS). Various membership functions of lane changing parameters are documented. Assignment of membership values for each class is done such that the obtained output give a realistic measure of the likely outcome of different factor combinations to reflect truly as much as practicable driver level decision towards lateral movement while moving in a mix traffic stream. Using series of input/output data set, the model constructs a fuzzy inference system (FIS) whose membership function parameters are tuned (adjusted) in combination of a least squares type of method and a back-propagation algorithm. This model could be used as an embedded tool for traffic simulation software, particularly to mimic lane changing behavior utilizing local data.
What makes a successful bio-product is a generating significant interest in many parts of the Canadian economy. In the broadest sense, a bio-product is based on renewable biological resources that can be used to produce fuels, chemicals, plastics and other industrial products. Many bio-products initiatives and private/public investments have run into trouble because of problems with value chain development and sustainability.

For any value chains to operate effectively, business leaders and policymakers need to understand where the value is created and how the created value can be captured. From a policy perspective, it is important to understand the factors that can contribute to success and failure of bio-product value chains.

Why do bio-product value chains fail? This paper introduces an approach that focuses on the basics of production and consumption in a value chain. When a value chain is distilled to its essence, production and consumption are based on three activities:

- Acquisition (A)
- Transformation (T)
- Distribution (D)

This analysis shows that it is feasible to analyze bio-products in terms of their values within the chain. As bio-products leave the laboratory and enter the market economy an increasingly important consideration will be their economic viability. The ATD model provides a methodology for that assessment.
Session 3.2.2 Supply Chain Issues

A Case Analysis of Supply Chain Investments

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ABSTRACT

This analysis presents a methodology to risk-adjust the rate of return required for investments in supply chain infrastructure. A simulation model generated cash flows resulting from potential capacity enhancements to an intermodal transfer facility for bulk commodities. The risk profile from firms that typically make this kind of investment was utilized to determine a required rate of return for the proposed projects that were evaluated based on benefit-cost ratios. The case study analysis integrates financial flows resulting from improvements in physical flows brought about by potential capacity changes.
Is Carrier Choice Different for 3PLs and other End-shippers? Some Preliminary Findings

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ABSTRACT

As companies have increasingly sought to outsource their non-essential activities, there has been a dramatic rise in the use of the services of external companies (often referred to as Third Party Logistics Companies or 3PLs) to organize transportation logistics. Little is known about the degree to which their choice of carriers differs from that of traditional end-shippers. Because this sector is expected to grow in the future and thereby to exert more influence on the way freight is shipped, understanding any differences that they might manifest in carrier choice is useful in itself, but also potentially critical in evaluating the potential for rail to increase its share of freight.

This paper presents some findings of a unique shipper carrier-choice stated preference survey of shippers in the Quebec City-Windsor Corridor. The survey was conducted during the fall of 2005. The survey was designed explicitly to evaluate shipper preferences for the carriage of intercity consignments, and particularly their preferences for carriers that contract the services of rail companies to carry these shipments via trailer on flat car (TOFC). Survey data were used to estimate mixed-logit carrier choice models. The resulting models suggest that while 3PLs behave similarly to other end-shippers in most respects, they are even more mistrustful of the use of rail to move their consignments than other end shippers. Among other things, this suggests that increasing rail’s share of freight faces tremendous challenges.
Shipping conferences and the exemption to these conferences from antitrust laws have been in existence in some countries for nearly a century. The 1990s witnessed mounting criticism against the exemption for these ocean liner conferences. But little was accomplished other than reducing the scope of the exemption. In a historic move, the European Commission is leading the way through this impasse by proposing to its ministers in 2005 to approve the repeal.

First, the developments in the European Union proposing the repeal of the exemption are examined. Second, the major developments in the US following its 1998 reforms are presented. Third, Australia’s review of its exemption are described and then Canada’s current status on this matter is reviewed. Finally, a few concluding remarks are provided.
The Port of Anchorage is currently undergoing an expansion project expected to increase its land size by more than double and its dock length by nearly triple. The project, to be completed by 2012, will be funded by federal and state grants as well as port equity. As Alaska’s regional port it serves 80% of the state’s maritime trade and 90% of its population. The strategic locale of the port has been put to use through several military deployments and, most recently, the Stryker Brigade Combat Team. It is also homeport for the U.S. Coast Guard Marine Safety and Security Team.

This paper outlines the economic impact of the Port of Anchorage in the midst of this $375.9 million project and in anticipation of the issuance of a new revenue bond. Previous research in 1999 estimated the total annual economic impact of the port to be about $750 million per year. New estimates for the total impact as well as its breakdown for direct, indirect, induced and employment impacts will be estimated.
Development of an Intermodal Freight Transportation Information System for Policy Analysis and Planning in the Manitoba Capital Region

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ABSTRACT

Intermodalism is a rapidly growing and important component of the freight transportation systems of urban and metropolitan areas. Its nature requires the collaboration, coordination, and cooperation of diverse public and private sector agencies for policy analysis and systems planning. In recent years, metropolitan areas throughout North America have been working to improve the understanding and service requirements of intermodal operations. However, many current information sources and systems used to generate this understanding are dated, inconsistent, proprietary, incompatible, or incomplete. This has a significant impact on the quality of decisions made, and the timeliness of these decisions.

This paper describes an initiative to design, develop and implement an integrated information system to better service policy analysis among the many and varied stakeholders involved in metropolitan intermodal freight transportation issues. The initiative converts intermodal freight data into information that can facilitate understanding and decision-making related to intermodal freight transportation.

This paper outlines the methodology used to develop an intermodal freight transportation information system for the Manitoba Capital Region and provides lessons learned from this process. The methodology includes the establishment of the transportation system, the demand for intermodal freight, intermodal commodity flows, and intermodal traffic flows and illustrates how integrating these components can be used as a tool to assist decision-makers regarding transportation and policy decisions.
Analysis of Pedestrian Safety on Five Major Arterial Roads in Dhaka, Bangladesh

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ABSTRACT

This paper presents manifold aspects of Pedestrian accidents in selected links of the five major arterial roads in Dhaka, the capital of Bangladesh which is one of the most accident prone cities in the world. Of all reported accidents in Bangladesh (1998 to 2004), 44% accidents are pedestrian accidents. About 62% of urban pedestrian accidents are concentrated in Dhaka City (1998 to 2004). Among different types of accidents in Dhaka, Pedestrian accidents are the predominant being 47% which reveals the deteriorating pedestrian safety condition in Dhaka city. These pedestrian accidents accounted for about 71% of all the fatal accidents occurring Dhaka City in last 8 years. The loss of lives are expected to continue if suitable corrective measures are not taken by applying engineering measures as appropriate through extensive research and investigations on pedestrian safety.

The major portion (about 67%) of the pedestrian accidents and pedestrian casualties (66%) of Dhaka City comes from the road links of Dhaka City. Inadequate and indiscriminate use of footpath, poor zebra crossing, uncontrolled signalized junction, lack of bus lay by on road side, lack of enforcement to force the pedestrians to use underpass and overpass, dangerous alighting and boarding passengers, lack of adequate median barrier etc. contribute to the high rate of pedestrian accidents in the links of Dhaka. So, countermeasure plan should be undertaken proposing basic traffic engineering countermeasures to reduce the number of pedestrian accidents and enhance pedestrian safety.
Population Synthesis: Comparing the Major Techniques Using a Small, Complete Population of Firms

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ABSTRACT

Population synthesis techniques are algorithms that take aggregate population data, as well as sample population data as inputs, and produce a complete list of a population’s members, each with associated attribute data, as output. Various types of synthetic populations can be created to suit different needs; these may include individual, household, dwelling and firm populations, to name just a few.

The purpose of this paper is fourfold: to implement the CO and IPFSR techniques for general use; to compare the two techniques, by measuring each one’s ability to recreate the known population; to ensure that for both techniques, higher quality input data yields higher quality synthesized populations; to gain an idea of the minimum input data requirements for each technique to produce synthetic populations of reasonable quality. These objectives are realized through a series of comparisons of the outputs from both techniques, using various levels of input data, to the known population.
The Role of Interactive Effects in Mode Choice: Understanding Automobile Ownership through Qualitative Research

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ABSTRACT

Many of today’s environmental problems are tied, in part, to society’s over-reliance on the automobile. However, efforts to bring about modal shifts typically have had limited success. Building on a growing body of mode choice and planned behaviour research, this study explores the factors influencing automobile ownership. A grounded theory approach is used to identify the factors associated with travel-mode change. Semi-structured interviews were conducted with 20 driving members of a car-sharing organization, located in a mid-sized Canadian city, who made a decision to go car-lite (car-sharing is their additional vehicle) or car-free (car-sharing their primary vehicle). Findings underscore the complexity of modal shift decisions and highlight the need to account for life events.
Session 4.2.1 Warehousing and Transportation

Investigating the Demand for Warehouse Space and the Spatial Attributes Influencing Those Decisions

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ABSTRACT

The availability of capacity in the warehouse and distribution center industry is a key component to sustaining a thriving economy, especially for a trade-dependent state such as Washington. Access to the capacity of these facilities is critical for the economic vitality of Washington industries that utilize them and their down-stream customers.

Although the demand for space in warehouses is such an important issue, estimating this demand can be a difficult task, primarily due to access limitations to specific data and information. Prior research efforts to estimate and determine the demand for warehouse space have utilized very simplistic models that have proven to be inaccurate and unreliable over time. Because these models use weak proxies and very broad information, the optimal location and square footage demanded is, at best, a rough estimation. The goal of this research was to develop an improved estimation model that will accurately determine the demand for warehouse space.

Some of the findings are consistent with previous research, while others are not. Initial investigation suggests that spatial attributes did not play a significant role in determining the demand for square footage in a warehouse facility, but examining the clustering patterns based on different attributes did give some information concerning locational impacts.
ABSTRACT

Conceptually, three categories of benefits from highway investments can be identified:

1. reduced travel costs for serving existing trips;
2. reduced inventory/logistic costs for firms; and
3. an increase in regional economic activity due greater operating scale and accessibility economies.

Conventional methods of cost/benefit analysis measure only a portion of the total benefits which theoretically accrue, due to disagreements on the attribution of benefits and/or difficulties in measurement. Multiple Criteria Evaluation techniques such as the Multiple Accounts Evaluation framework used by the BC Ministry of Transportation assess some of these potential benefits in a qualitative fashion but do not attempt to quantify them.

There have been numerous recent articles and studies focusing on estimation of the benefits to firms in terms of reduced inventory and logistics costs for firms. The U.S. Federal Highway Administration (FHWA) has made available a modeling tool called the Intermodal Transportation and Inventory Cost State Tool (ITIC-ST) which was developed in the course of a major study on the impact of truck weights and dimensions in the Western U.S. States. In addition to estimating changes in transportation costs, ITIC-ST estimates the impact of the reliability of transportation on firms inventory and logistics costs.

This paper highlights a study done for the BC Ministry of Transportation which uses the ITIC-ST methodology to estimate the impact of increased highway reliability on inventory and warehousing costs for freight flows on the Highway 1 Corridor in B.C. It includes a description of the ITIC-ST model, the methodology for identification and estimation of the major parameters used in the analysis, and a summary of the results.

The validity of this methodology for including supply chain benefits in analysis of infrastructure improvements is discussed in relation to conventional measures, and the implications for design
of performance measurement systems for estimation of benefits and post-project evaluation will be highlighted.
Warehousing Strategy: The Limits of the Theory of Inventory Centralization

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ABSTRACT

According to Slack & alii (2004), the common approach to deciding how much of any particular item to order, when stock needs replenishing, is called the economic order quantity (EOQ) approach. This approach attempts to minimize the total cost. The sum of holding and order costs is minimized when order quantity is equal to \( \sqrt{\frac{2DC_o}{C_h}} \). This value (also called Wilson formula) constitutes the optimal quantity, that is to say the EOQ. In this formula, \( D \) represents the demand per period of time, \( C_o \) is the cost of placing an order and \( C_h \) the cost of holding one unit in stock for a period of time.

By close links with this approach, the theory of inventory centralization is based on the Square Root Law (Starr & Miller, 1962; Maister, 1976; Fernie & Sparks, 2004), which is establishing the global cost from the cost of holding inventories. In this case, the move from ten depots towards a completely centralized system using only one warehouse reduces the inventory requirement by 68 per cent (McKinnon 1989), that is to say exactly: \( \left[ \frac{1}{\sqrt{10}} \right] - 1 \). It is besides the reason why we call this law the Square Root Law (SRL).

The theory of inventory centralization is at the moment somewhat questioned. Indeed, the costs of transportation are increasing (in particular with the increases of petroleum prices), and this is why stocks could be redistributed (and therefore less centralized) over different sites… Moreover, if the hypothesis of a constant \( C_h \) does not constitute a problem, one could not say the same for the hypothesis of a constant \( C_o \)... This is why we question through this research the SRL: “\( C_o \) cannot be considered any more as a constant data in different scenarios”. In fact, \( C_o \) depends on the number of sites and, about this point, there is a known trade-off between warehousing and transportation: as the number of sites is high, the cost of operating them is also high, but transport operating cost is low, and vice versa (Cooper & alii, 1991).

For that, we can consider two scenarios. In the first scenario (d depots), the order cost, which includes transportation cost, is less than the order cost of the second scenario (w warehouses) and not equal as in the traditional model of the SRL, because transportation between warehouses and final customers constitute a new cost for the retailer.
ABSTRACT

There has been an explosion of interest in inland container handling facilities as an alternative means of expanding the capacity of on-dock container terminals at seaports. Rising land costs and urban encroachment on port facilities are pervasive, affecting all but the most recently constructed greenfield port sites. Growing community pressures to mitigate the environmental and traffic congestion impacts of port operations have also constrained the ability of ports to expand their capacity.

However, a rush to inland facilities risks sacrificing the efficiency of the inland transportation and handling systems. This is particularly true for intermodal cargo, because both the flow of cargo and the flow of containers must be accommodated.

This paper examines the potential system impacts of inland container handling facilities on the efficiency and community impacts of port operations, based on the existing facilities in British Columbia’s Lower Mainland. The analysis will focus on major container-handling port clusters including Port of Vancouver’s terminals on the South Shore of Burrard Inlet and at Roberts Bank, and Fraserport’s Surrey and Richmond properties.
Atlantic Gateway Opportunities and Challenges

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ABSTRACT

Atlantic Canada has traditionally played a major role in international trade through its deep water ports and other transportation infrastructure. However the economic opportunities go well beyond the simple transportation of goods. Today the focus is on logistics which opens up new opportunities for areas such as Atlantic Canada.

The paper is based on a research project undertaken in 2006 that examined the opportunities for New Brunswick from the increased international freight traffic passing through, around and over Atlantic Canada. The study examined the opportunities for New Brunswick to add value to the logistics chains for the major trade flows.

This paper expands the focus to include Atlantic Canada and identify the types of opportunities that should be pursued. The paper proceeds to examine the constraints, issues and potential benefits.
ABSTRACT

The development of Inland Ports, particularly as Gateways for non-traditional Corridors, is being undertaken as a strategy for economic development by many jurisdictions. The opportunity is created by growing congestion over traditional, coastal gateways and their associated corridors, and needs for massive infrastructure investments. Inland port developments generally aim to take advantage of existing infrastructure bases. The benefit of attracting trade processing over non-traditional inland ports is that other value added processes tend to be undertaken where trade is processed, from assembly to break-bulk activities. While the economic activity associated with the transportation services and trade processing are not insignificant, the real economic development is from these value adding activities.

The research reported in this paper was undertaken as part of the feasibility study for the Canada East Inland Port located in Moncton, New Brunswick. The research was to define the State of the Art of Inland Port development as the context for assessing the feasibility of an Inland Port development centred on the expansion of the Dieppe Industrial Park located on the north side of the Greater Moncton International Airport and straddling the CN Rail mainline and the Trans Canada Highway.

Case studies were undertaken of inland port initiatives along the mid continent corridor of North America including: Winnipeg, Des Moines, Kansas City, Fort Worth and San Antonio; the NASCO Conference was also attended. Visits were also made in northern Europe including: Lille, Rouen, Duisburg and Luxembourg.

The major finding of the study was that it is as important for a community’s economic development in the 21st century to be a port on a corridor as it was to be located on the railway in the 19th century. The local case is illustrated by the development of Winnipeg over Selkirk when it was chosen as the western Canada gateway for the Canadian Pacific rail corridor. Today, Winnipeg aspires to be an inland port based in part on the polar routes connecting to the mid continent corridor for North American distribution.

The paper presents the findings from the case studies, the factors required for successful development and suggest strategies for smaller, no traditional jurisdictions like New Brunswick and Manitoba.
ABSTRACT

Mots clés: Transport urbain, Recherche opérationnelle, la décision à multicritères, transport maritime de courte distance.

Depuis quelques années, le problème de congestion routière préoccupe la plupart des villes cosmopolites. Dans cette étude, nous travaillons sur le problème de congestion du transport intremodal d'Istanbul pour le passage du Bosphore. Istanbul se situe entre les cotes Asiatiques et Européennes. Le transport urbain au Bosphore se réalise actuellement par trois moyens : les deux ponts du Bosphore et le transport maritime. Nous focalisons dans ce travail sur trois alternatives possibles pour déterminer la meilleure solution de transport: la construction d’un 3ème pont, la construction d'un tunnel férrovière passant sous la mer de Marmara et l’amélioration du transport maritime. L'étude que nous présentons se déclinerà selon plusieurs critères et orientations tels que l'économique, l'environnement, l'aspect social et culturel et d'autres critères liés aux politiques des transport.

Nous avons choisi la méthode de TOPSIS pour le choix multicritères. Nous détaillerons le choix de cette méthode qui s'avère, dans le cadre de notre travail, être la meilleure méthode a priori étant donné que certaines de nos données sont obtenus à partir de questionnaires. Apres avoir déterminé la meilleure alternative, nous discuterons l’efficacité de la solution selon plusieurs points de vue tels que la sécurité routière et l’aspect économique.
ABSTRACT

The primary objective of this study is to investigate the spatial relationships between construction aggregate shipments and the per axle payload weights of trucks as it pertains to highway deterioration, applied in this case to the State of Washington. Because the productive life of the pavement is directly affected by frequent, heavy aggregates shipments traveling long distances, this study focuses on the relationship between pavement damage and axle payload weights.

This study utilizes data from a survey investigating the transportation and operational characteristics of Washington’s mined products conducted under the six-year comprehensive research project Strategic Freight Transportation Analysis at Washington State University. A previous study investigated the transportation characteristics of mined aggregates using a spatial autoregressive model, where a significant positive relationship between payload weights and shipment distances was established. This study expands by assessing the “contribution” of aggregates hauling trucks to pavement deterioration using per axle loads.

The results reveal a statistically significant, positive relationship between per axle weights and the shipment distance categories. According to the well established per axle weight and pavement damage relationship, incremental changes in per axle payload weights resulting from longer shipment distances clearly suggest that longer haulage increases the magnitude of pavement deterioration. This direct relationship between road impact and the distance hauled emphasizes the importance of the proximity of mine sites to different end users, supporting the Department of Transportation and private aggregate mining firms in utilizing gravel sources close to job site, even if they lack economies of scale.
ABSTRACT

Throughout Canada’s history, transportation has been a major part of national policy. Policy has not remained static; it has evolved over time to adapt to new challenges and changes over time. Ample testimony of this is provided in the major milestones in Canadian transportation policy, the subject of this paper.

The policy in rail transportation and air transportation are the focus of this paper. First, an overview of policy in rail transportation is presented and then the major milestones in rail transportation in greater detail. Second, an overview of policy in air transportation is presented and then the major milestones in greater detail. The future of transportation policy and future concluding remarks are presented in a companion paper dealing with water and highway transportation policy.
Water transportation has always played an important role in Canada’s internal and external trade from the early colonial days. It is much older than highway transportation dating back to the 1600s and so is its policy. Roads played no part in the imagination of 19th century Canada nor did they offer the early settlers freedom from the tyranny of nature. It is therefore not surprising that there was no clear discernible road policy before 1850.

First, this paper provides an overview of policy in water transportation and then examines the milestones in water transportation. Second, an overview of policy in highway transportation and its milestones will be reviewed. Third, our view of the future of transportation policy will be briefly described. The final section presents a few concluding remarks.
Session 5.3.1 Transportation Education

“50 Years of Transportation Education -- Then, Now and Next”

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ABSTRACT

The origin of this paper was to reflect on the changes that university transport education has undergone over the last fifty years since the UBC Faculty of Commerce and Business Administration (now the Sauder School of Business) was established in 1956. Its Bachelor of Commerce degree program has allowed students to specialize in transport and related subjects since that time. This paper reflects on the changes that have taken place in the transport and logistics industries, and how North American university transport programs and some individual courses have changed as well. In 1956, transport was rail-dominated and each mode was regarded as a separate entity with its own unique problems but subject to extensive government controls. “Logistics” was an arcane military term. How times have changed. The changes in industry, markets and education are summarized emphasizing the links between economics, management and public policy issues with transport education. We conclude with prospective developments.

We characterize the changing orientation over four periods plus the future:

1. 1950s: Descriptive; modal focus with rail dominant; regulated industry; traffic management.
2. 1960s and 1970s: More analytic, particularly economics of markets and competition to replace detailed regulation; logistics management; stronger economic base for management and public policy analysis;
3. 1980s to mid 1990s: Deregulation implemented and analysis of deregulation experience; growing resource constraints; greater attention to management tools and less on economics; greater integration of transport and logistics with other subjects; gradually less attention to public policy issues in transport.
4. Mid 1990s to present: Supply chain management processes and tools gain wide acceptance; better integration with other business subjects; global and integrated transport orientation; resource constraints and lagging infrastructure investment.
5. Future: Global perspective essential; greater integration across companies and operations; public issues of policy and investment resurface; environmental concerns begin to be taken seriously hence reconciling environment and transportation supply and demand becomes important.
Session 6.1.1 Transit Usage and Productivity

Trip Chaining and Men and Women Drivers in Canada

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ABSTRACT

Trip chaining is the practice of stopping at intermediate points during a journey. Examples might be stopping for a coffee, stopping to drop children off at school, picking up dry-cleaning, all on the trip to work. It is encouraged as a good driving behaviour from an energy consumption perspective. It can complicate the life of engineers planning commuter travel patterns. Analytical work in other countries have found that a “key difference in the developed world is the propensity of women to combine a set of activities relating to their extensive range of household tasks within the overall structure of one journey period (trip chaining) whereas men are more likely to make a single purpose trip” (Turner and Grieco, 1998). Do men and women in Canada have different trip chaining behaviour?

This paper uses some earlier work based on the General Social Survey and more recent data from the 2005 Canadian Vehicle Survey to examine trip chaining behaviour from a gender perspective.
Exploring the Impacts of a Universal Transit Program:
A Case Study of Brock University

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ABSTRACT

In this paper we present and discuss the results of a study that explored various impacts of Brock University’s “U-Pass” program, which provides students with fare-free public transit access in exchange for the payment of a flat-rate annual fee. The study results suggest that this program is viewed positively by most students, including many who are required to pay the annual fee but are either unwilling or unable to commute by public transit.

Among the program’s benefits are a dramatic increase in public transit ridership among students, the reduction of on-campus parking pressures, and a lower cost of attending university for many students. However, the study also identified several challenges that, if addressed, could potentially lead to improved service efficiencies for the three transit agencies taking part in the program and, ultimately, further transit ridership increases among students.
ABSTRACT

The concept of urban sustainability is much discussed, yet remains difficult to define. That being said, a plethora of operational measures to assess urban sustainability are presented in the literature. In this paper we adopt a broad range of these measures to assess the cities of Hamilton, Ontario and Halifax, Nova Scotia. Our purpose is two-fold. First, we explore each urban region in terms of spatial structure and urban design in order to gain a better understanding of the two study areas, to underlie an eventual modeling effort. Second, we use various quantifiable measures of urban sustainability to directly compare the Hamilton Census Metropolitan Area (CMA) to the Halifax CMA. The measures of urban sustainability which refer to the urban transport system are emphasized in the discussion. This sort of comparison is relevant in that it can serve to ascertain the effects of different policies and urban landscapes on urban land use and transportation sustainability. Furthermore, comparisons between the cities of Halifax and Hamilton are few and far between.
Projections of British Columbia-Washington Truck Freight Border Crossings Based on Commodity Trade

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ABSTRACT

As the Canada and the United States move forward in interactive trade, continuing adaptation to the changing transportation needs is critical in maintaining efficiency and reducing costs of raw and manufactured goods. This project identifies key commodity groups in order to create a profile and project future traffic at major and minor British Columbia border port crossings. The central resource used to create the port profiles is the Strategic Freight Transportation Analysis (SFTA) database, which is a compilation of freight origin-destination survey results conducted by the Transportation Research Group at Washington State University. The survey, allows for the examination of freight flow routes by commodity, both northbound and southbound, thus allowing profiles to be created for seven border ports in British Columbia, many not known to be evaluated before this research effort.

Once the profile was created, projections of northbound and southbound truck crossings to the year 2015 were estimated for each border port. Linear regression analysis was used to determine the potential growth of crossings by border port, based on the growth of trade between Canada and the U.S. and the commodity profile of each border crossing. Particular attention was paid to the effect of empty trucks on traffic growth.

Twenty-two commodity categories crossing the various British Columbia border ports were identified and forecasted to 2015. Based on the growth of trade in these commodities, there is an expected ten year growth in the number of annual truck crossings ranging from 3,000 trucks in Patterson to 159,000 trucks at the Pacific Highway border ports.
The methodology used is unique and was successful. Furthermore, these projections on the future composition of commodities crossing between Washington and British Columbia serve as a guideline for future transportation of traded goods and the infrastructure investments necessary to support those flows.
Freight Transportation: Who Is The Decision Maker?

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ABSTRACT

An efficient goods movement system is essential to economic growth of a country. However, the majority of Canadian urban areas do not have data sources that provide the level of detail required to create sophisticated transportation modeling frameworks to evaluate policy and plan infrastructure. In order to effectively model freight movement, an in-depth understanding of the decision makers is required. However, freight transportation is a very complex system and involves many stakeholders, which complicate the policy-making and planning process. Therefore, a better understanding of the relationships of all stakeholders involved and their behaviour in the goods movement system is crucial.

This paper explores the roles and relationships of the decision makers in freight through a comprehensive review of the current literature. From this review, the major decisions and actors for these decisions are identified and mapped using Unified Modeling Language (UML) notation to better understand the relationship of the actors. Then current modeling frameworks are then discussed and evaluated based on the review of the stakeholders and the decision making process identified. This paper will focus on the actors that are responsible for the transportation of goods in the supply chain and as a result does not focus on a single company or business.
Canadian Transportation Networks

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ABSTRACT

Networks in transportation have existed in Canada for some time and their importance has been highlighted since globalization. Some observers believe that they define the key to success in today’s dynamic marketplace. This is hardly surprising in a world where being able to provide service is of paramount importance since the dismantling of regulatory, legal and international barriers.

This paper considers the theme of this year’s conference ‘Canadian transportation networks: gaps and opportunities’. It reviews the meaning of a network and the various networks in different transportation modes. The gaps and opportunities in Canadian transportation networks are examined thereafter. Then the economic rationale for networks and their impact is briefly considered. Finally, the treatment of networks under the Competition Act and in two other major jurisdictions are briefly examined.
North American Gateway and Corridor Initiatives in a Changing World

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ABSTRACT

The explosive growth of the Asian economies and in particular, those of India and China, are transforming the global economy, world energy demands and world trade flows, transportation networks and infrastructure of ships, ports, railways, roads, planes, airports and all of their related multi-modal handling facilities. Central to the transformation of global trade logistics is the role of Gateways and Corridors in the economic development of region’s and continents.

Canada’s Asia Pacific Gateway and Corridor Research Initiative is a consortium of four western research agencies established to explore the role of Gateways and Corridors in the economic development process. The research consortium conducted three roundtables in the Prairies at Calgary, Regina and Winnipeg and a major conference at Vancouver in the spring of 2007.

This paper provides a brief introduction to some of the theory, concepts, reality and issues surrounding the development of trade gateways and corridors in Canada and around the world and identifies areas for further research and policy development for Canada and North America to retain their competitive position in the global economy.
Session 6.3.2 Gateways and Corridors

A North American Transportation Infrastructure Strategy

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ABSTRACT

The North American economy best visualized as a deeply integrated continental system, a system that is structured by networks linking production centers and distribution hubs across the continent. These linkages rest on ties to business, communities and local and state-provincial governments.

In the 1990s, flows of goods and capital across North America’s internal borders increased dramatically. More and more of the movement of goods was intra-company, reflecting the deepening of cross-border production, distribution and supply systems. With little government involvement, companies worked out their own strategies for building new continental systems and solving problems as they arose.

But limits to bottom-up growth began to emerge. Today, our transportation and border infrastructure barely suffices to support this expanding North American economy. We have relied far too long on aging infrastructures and traffic management systems in all transportation modes, and there are still too many public policy and regulatory barriers to effective adaptation of the transportation system. Indeed, national regulatory systems affecting transportation systems often work at cross purposes. What this means is that the ability of North American firms to extend and even maintain cross-border supply chains may be at risk.

How can we think about a strategy that will lead to an efficient and secure North American transportation infrastructure for the 21st century?
Economists are very bad at explaining why particular countries, regions, or cities perform better than other. Theories abound and policy suggestions are numerous and varied. Over the years there has been a continuing interest in the role that transport can or should play in the economic growth process. Interest has fluctuated between looking at the general role of transport as a stimulus, a causal factor, in economic growth and the specifics of particular modes of transport or forms of transport initiative. Among the latter, the notion of developing transport gateways and corridors has often been posited as a way of using transport to foster growth in a region.

This paper takes a critical look at this concept and considers the usefulness of the gateway/corridor concept as a development tool in the context of modern industry, transport technology, and institutional structures. The paper examines some of the theoretical issues involved and takes a number of case studies for illustration.
Research on competition among trucking firms has focused on the coalignment (or fit) between business-level strategy (e.g., Low-cost, differentiation, and focus strategy) and firm resources. In this study, data were collected from top executives of 332 motor carriers in the U. S. Using competitive strategies of differentiation (innovation and customer responsiveness) and low cost and resources of logistics and management and human resources in the trucking industry, we developed ten combinations that used varied strategies and resources to accomplish firm performance.

Performance is measured in terms of five dimensions: efficiency, flexibility, quality, timeliness, and resource acquisition. Further, based on the ten combinations, we constructed twelve configurations of strategies and resources used by organizations in our data set of motor carriers. Finally, using analysis of variance, we compared the twelve configurations with respect to each dimension of performance. We find significant differences across a few configurations as well as support for equifinality across other configurations.
Contingency Planning for Unpredictable Absence of Delivery Vehicle Drivers

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ABSTRACT

Unexpected absence of drivers calls for emergency operational tactics to ensure completion of planned merchandise deliveries. A standard contingency in the literature is to create a pool of reserve drivers (e.g., typically a pool of standby drivers and draw exclusively draw from this pool as circumstances dictate. Because of the expense to maintain a staff complement of part-timers, alternative contingencies warrant consideration.

This paper proposes an alternative that minimizes the part-time pool by reassigning routes/workload among drivers who do show up at work. In the multi-route vehicle routing problem, the opportunity to use this alternative arises because the cost-minimizing distribution of travel distances across routes often allows one or more drivers to perform the extra duty of handling an additional route (subject to time-window and workload constraints). By accounting for costs such as overtime rates when drivers are called on in emergency situations to do more than their originally assigned driving duties and the cost to maintain the part-time staff, this study tests the efficacy of the aforementioned alternative. Its efficacy is confirmed by the fact that it is less costly than the standard contingency: while the standard contingency adds just under 22% to driver payroll, the proposed alternative adds a noticeably smaller cost of slightly over 14%.
Session 7.1.3 Motor Carrier Issues

Cost of Light Road Vehicles in Canada

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ABSTRACT

Light road vehicles clearly dominate domestic passenger travel. However, their impact in terms of total cost has not being fully explored in Canada. This paper examines the total cost of light road vehicles in the year 2000. It breaks down various light road vehicles cost categories by vehicle class, geographical region, and vehicle age. In addition, it analyzes cost categories from different perspectives such as distance traveled on highways and otherwise, passengers, and different types of roads. The present study is one of the research components of the Full Cost Investigation (FCI), a project by Transport Canada with the support of provincial and territorial departments of transport.

One of the main challenges and contributions of this exercise is linking unit cost technical studies with data on the intensity of use from the Canadian Vehicle Survey. It expands the potential of existing data sources by creating new variables and cost categories. It provides a first basis for future comparisons between light road vehicles and alternative modes of transportation. The results show the pattern of light road vehicles use depending on vehicle age, geographical location, and vehicle size.
The mid 1980s witnessed a new era for the introduction of competition in rail transportation when reforms were proposed. It was supposed to signal a new era in Canada's transportation history - an era of greater competition, less regulatory intervention and more innovative transportation services. An era when more choices and greater competition in rail transportation would be made available to shippers.

In this paper, one of the competitive access provisions: competitive line rates (CLR) are examined. First, the concept of CLR and the objectives of the CLR will be examined. Second, the CLR provision in the 1987 Act, issues in decisions on CLRs of particular interest and the 1996 amendments will be examined. Third, the underlying theory behind the CLR will be reviewed; various views on how it could be improved and the new competitive connection rates provision will be examined. Finally, a few concluding remarks will be made.
Session 7.2.2     Rail Regulatory Issues

CCR - an idea that is premature and founded on a false premise

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ABSTRACT

CLR do not work. NTARC found as much in its 1993 report when it said:

“CN and CP Rail have effectively declined to compete with each other through CLR, and as a result the provision largely inoperative in Canada.”

Not much has changed since the statement was made. The remedy is rarely used because it is subject to far too much uncertainty (as to rate outcome), cost (legal and management costs are prohibitive for most shippers) and time (a minimum 120 day determination, likely exacerbated by interlocutory motions, all for a one-year rate). It does not merit serious consideration by shippers in an environment of planning and projection that is based on much longer investment horizons.
Commercial Dispute Resolution between Railways and Shippers in Canada

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ABSTRACT

The economic regulation of freight railways in Canada has been in place for decades. More recently, the focus of such regulation has been on remedies to provide a measure of protection to shippers - Final Offer Arbitration of freight rates, Competitive Line Rates, Interswitching Regulations, and a review process by the Canadian Transportation Agency under Level of Service provisions to consider whether a railway is fulfilling its service obligations.

There has been a general shift in legislative circles towards alternative dispute resolution mechanisms such as mediation and arbitration as a means to avoid costly and lengthy court cases. In the US, the National Grain Feed Association has negotiated processes for mediation and arbitration between their members and the American Association of Railroads.

This paper considers the development of a new Commercial Dispute Resolution mechanism to settle disputes between railways and shippers in Canada, as a means of developing a more effective and cooperative relationship between railways and shippers over the long term.
When a loved one is lost in a crash, mourners often place roadside memorials to help with their grieving process but the placing of memorials has raised many questions about the impact the memorials themselves have on road safety. The two main views are that memorials either reduce road safety by distracting drivers or improve road safety by warning other drivers to proceed carefully. This paper collected and examined data relating to the effects of roadside memorials to allow for better informed policy to improve road safety.

Responses to the driver questionnaire revealed that the majority of drivers preferred an informally allow policy; even those strongly opposed to memorial use acknowledged the importance of the memorials for the grieving process. In addition, many respondents report that they slow down in response to seeing a memorial. Responses to agencies survey indicated that road agencies in Alberta mostly do not have a policy, largely attributed to the sensitive nature of the subject and the political issues. The important factors agencies considered are discussed and the alignment of these issues with road user views is discussed. Collection and analysis of speed, following distance, and collision rates is also discussed as ongoing research.
Fast or Not So Fast: Benefits and Costs of Voluntary Security Investment for Canadian Motor Carriers

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ABSTRACT

The Free and Secure Trade (FAST) initiative allows low risk goods transported by trusted drivers and trusted carriers to pass rapidly through border crossings. Participation in this voluntary border security program has not exceeded 50 percent. This paper examines the benefits and costs of implementing FAST. Canada to U.S. border processes are captured in process maps, a simulation model is developed and the model is populated with arrival and processing times of commercial vehicles. The waiting time benefits of implementing FAST by truckers are found to be dependent on the traffic density of the border crossing and the FAST adoption rate. We find that truckers who do not adopt FAST also benefit from FAST adoption as the waiting line in the non FAST lanes decrease. Policy implications are developed for how the FAST should be implemented.
Tangible and Intangible Benefits of Security Measures for Transportation in Canada

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ABSTRACT

Focus on the security of transportation networks has increased since the terrorist attack of September 11, 2001 and subsequent attacks in Madrid and London. Transportation networks have characteristics that make them particularly attractive to terrorists. These include:

- Multiple access points;
- Economic importance;
- High visibility; and,
- Public involvement and ownership.

Enhanced security has increased government spending and the costs of the private sector. Between 2002/03 and 2006/07, the Government of Canada collected $1.97 billion through the Air Travelers Security Charge for increased screening at airports in Canada. Canadian exporters face the costs of advanced notification systems and inspection of goods at ports of exit to the U.S. and tougher entry documentation requirements for persons. The cost of increased wait times for trucking companies at the Canada/U.S. border is estimated to range from $Cdn 179 million to $Cdn 406 million.

The cost and effectiveness of transportation security programs is an on-going debate. This paper examines the other side of the cost-benefit equation. The purpose of this analysis is to provide some balance to the discussion of increased transportation security by focusing on the benefits that security measures yield.

The paper begins with some theoretical concepts of risk assessment. Against this backdrop an economic model of social costs and benefits is described. The qualitative assessment of the tangible and intangible benefits of security based on this foundation is presented.