

## **INTRODUCTION TO THE ISSUES AT THE CTRF 2010 CONFERENCE**

The transportation and logistics landscape has changed dramatically in recent years. Shippers have attempted to minimize their working capital by reducing their inventory and seeking more efficient supply chain. Carriers have attempted to become more efficient and responsive developing more efficient systems to meet the new global trade patterns that have emerged with China and India. Governments have substituted deregulation for regulation and private ownership for government ownership to ensure better provision of service. Individuals have called for greater mobility and population and trade increases have placed greater strains on the existing infrastructure. Therefore the basic theme of the 2010 CTRF Conference is *Transportation and Logistics Trends and Policies: Successes and Failures*.

These global and domestic developments have raised several issues which this conference will explore and debate. Beyond the main conference theme, provoking sessions will examine emerging issues and trends in areas such as: safety, logistics and goods movement, urban transportation, human resource issues and the environment.

### **Organization of the Proceedings and An Overview of Individual Papers**

The papers presented in this Proceedings are organized under eighteen sessions: active transport (1); motor vehicle safety (1); transportation and supply chains; active transport (2); gateways and corridors; benchmarking and statistics; road congestion and emissions; marine transport; safety and dangerous goods; freight logistics; industry competition and market structure; transportation modelling; motor vehicle safety (2); policy and transportation trends; transport economics; mode choice; surface transport; and urban transport.

#### **1.1 Active Transportation I**

*Kristian Larsen and Jason Gilliland - Environmental characteristics associated with adult walking behaviours* - The authors examine whether urban form influences walking behaviours of adults in a typical, mid-sized North American city. Using a telephone-based survey, data on characteristics were gathered and a Geographic Information System was used to link survey data. Then a statistical analysis was employed to test the influence of individual-level and environmental factors on walking

behaviours. The practical implications of this research and areas that require more attention are indicated.

*Raktim Mitra and Ron. Buliung - The built environment, autonomous mobility, and school travel mode choice in Toronto* - This research focuses on school travel, and explores age-related differences in mode choice behaviour in the City of Toronto, Canada. Two research questions were investigated: (1) does independent mobility explain school travel mode choice?; and (2) does the relationship between mode choice vary across age groups? The findings suggest that household escorting decisions influence mode choice, and that mode choice behaviour varies across age groups. It ends with a discussion of the implications of the findings for urban policies focused on active school transportation.

*Sheyda Saneinejad, Christopher Kennedy and Mathew J. Roorda - Modelling the Impact of Weather on Active Transportation* - The effect of climate and weather on transportation choices, walking and cycling, has remained less explored. This paper introduces a weather sensitive mode-choice model developed using a combined database of travel activity and the corresponding historical hourly weather conditions in Toronto city. Weather features integrated in the model include categories of temperature ranges, wind speed, and four precipitation conditions. Two sub models are also developed and the results are examined.

## **1.2 Motor Vehicle Safety I**

*Shamsunnahar Yasmin Sabreena Anowar and Richard Tay - Injury Risk of Traffic Accidents Involving Emergency Vehicles in Alberta* - This study attempts to identify the factors that might have an influence on the probability of injurious crashes in Alberta involving at least one emergency vehicle. A binary logit model was used and the results show that crashes occurring during emergency response were less likely to be injurious during an off-peak hour, in a single vehicle accident, or when the driver is male. The risk of injurious accidents increased when the driver violated a stop or yield sign or traffic signal or when the vehicle hit a fixed object. Interactions with emergency vehicles might help in reducing these crashes.

*Md. Ahsanul Karim, Md. Mazharul Hoque and Md. Hadiuzzaman - Modelling Major Accident Types on National Highways in Bangladesh* - The

authors develops accident prediction models to express the relationship between occurrence of accident with traffic flow and road geometry based on data from *Dhaka-Aricha National Highway* in Bangladesh. A generalized linear modeling approach was used to develop separate models for major types of highway accidents. Increases in average annual daily traffic and speed increase the number of head on, rear end, overturning, hit pedestrian and total accidents and a conversion from a two way lane highway to a four lane has the reverse effect.

*Mina Hassanvand, John Douglas and Richard Tay - Speed Effects of Roadside Memorials on Curved Road* - Roadside memorials to loved ones lost in traffic mishaps have recently become a more common feature in Calgary. They have raised concerns about their potential effects on driver behaviour and traffic safety. This paper reports on a project to measure the effects of roadside memorials on traffic speed on curved roads using a mock-up memorial at three locations in the City of Calgary. The results provide some indications that roadside memorials placed before the start point of a curved road act to reduce the speeds of the vehicles entering that curve. The effect was statistically significant at only one location.

### **I.3 Transportation and Supply Chains**

*Benoit Sanclemente-Lalana - Les Technologies d'Information et de Communication appliquées à la logistique amont automobile* - Cette étude s'adresse aux logisticiens désireux de diversifier leurs activités vers la logistique amont automobile, mais pas uniquement. Elle présente, à travers trois scénarios composant une méthodologie évolutive de déploiement et d'utilisation des Technologies d'Information et de Communications, les meilleures pratiques d'un logisticien en réponse aux problématiques du secteur.

*Joseph Monteiro and Darryl Anderson - Cool Cargoes, Reefers and Refrigerated Shipping* - The world's hunger for fresh fruit and perishable foods has stimulated interest in transportation of cool cargoes. It has led to broaden agricultural trade agreements with countries. Does this spell prosperity for the future of the refrigerated shipping industry? And if so will this affect its composition and structure? In this paper, these issues are examined together with their shipping routes and the split of cargoes between reefers vs refrigerated containers are reviewed; and the important

regulations. Finally, it examines whether further consolidation in the reefer industry raises an issue.

*William P. Anderson and Andrew Coates - Delays and Uncertainty in Freight Movement at Canada-US Border Crossings* - This paper analyses global positioning system-based data on crossing times by Transport Canada. The dataset contains observations for individual shipments at specific dates, times and locations, making it possible to measure both crossing times and the variance in crossing times over a 24 hour period. We compare crossing time performance at four key bridges – the Ambassador Bridge, the Blue Water Bridge, the Peace Bridge and the Lewiston-Queenston Bridge. A buffer time index is calculated as a measure of the cost of uncertainty in crossing times.

## **2.1 Active Transportation II**

*Asya Bidordinova - Motivators and Barriers to Utilitarian Cycling in Downtown Toronto* - This study investigates factors that increase or decrease the likelihood of riding bicycles for utilitarian purposes in downtown Toronto. Data was collected and both parametric and non-parametric analytic techniques were used to investigate factors that are positively or negatively associated with cycling. The author indicates that the results will be useful for further promoting cycling.

*Andrea Oppedisano - Mid-rise Buildings on Toronto's Avenues-Responding to the Public Realm* - The City of Toronto anticipates up to 500,000 new residents over the next 20 years. Main streets or avenues are no longer suitable for accommodating Toronto's future growth. But how exactly should Toronto's avenues intensify? To answer this question, the City has undertaken a study which examines how to encourage a built form which respects and positively responds to the needs of local pedestrians and adjacent uses.

*Tony Redington - Modern Roundabout Technology Unlocks the Stifled Walking Mode in Canada and United States* - This paper surveys the pedestrian mode and its relation to the 44-year-old modern roundabout technology. It explores the modern roundabout and the pedestrian mode issues. It concludes by suggesting the roundabout as central to fostering the

pedestrian mode and shifting urban trips from the auto mode to pedestrian, bicycle and transit modes.

## **2.2 Gateways and Corridors**

*Darren Prokop - Adak, Alaska: A Marine Business Case* - The author in this paper attempts to determine if efficiencies exist for large ocean vessels, plying the North Pacific Ocean's great circle routes, in using Adak, Alaska as a port of call for refueling. The author briefly examines Alaska's success in becoming a global air cargo gateway and its lessons for ocean carriers. A discussion of the range of operations of these carriers along these routes is provided. Finally, the marine business case for Adak is set out.

*James D. Frost - The Close Dry Port Concept and the Canadian Context* - The issue of "dry ports" or inland terminals has been considered in Nova Scotia, New Brunswick, B.C., and on the Prairies. This paper will consider several examples in North America and Europe and suggest their applicability in the Canadian context. The issue is important from a "sustainability" standpoint, in terms of container movements within congested urban areas. They also have the potential to provide an efficient means for coastal ports to extend their markets inland.

*Maryem Ahbib - Continental Gateway and Trade Corridor Quebec-Ontario: better multimodality* - This research applies a Benefit-Cost Analysis (BCA) to the transportation network of the Continental Gateway and the Trade Corridor Ontario-Quebec (CGTCOQ). It also proposes a structure of a National Planning methodology to the same area.

## **2.3 Benchmarking and Statistics**

*Garland Chow and Vijay Gill - Towards the Development of a System-Wide Total Logistics Cost Index* - The performance of the transportation sector cannot be measured by direct price alone, service has also to be considered. The authors present an approach that can be taken to develop an aggregate indicator of Total Logistics Cost performance over time by employing logistic cost models that use transit time and transit time variability as key inputs. Potential applications of the model and the data are also described.

*Marc-André Roy and Elizabeth Drake - Benchmarking Performance of Intercity Passenger Rail Operations: Challenges & Strategies* - This paper:

i) outlines some of the challenges and issues in benchmarking and comparing intercity passenger railway performance, and ii) presents some of the strategies and methodological approaches used to address these challenges. Specifically, this paper outlines methods used for defining and promoting a common basis for comparison of passenger rail KPIs (key performance indicators), ensuring the comparability of underlying data, as well as facilitating the development of clear and robust policy lessons.

*Masood Hassan, Keir Packer, Tony Churchill and Alan Windhorst - Statistical Compendium of Freight Transportation in Alberta* - This paper presents a summary of the salient aspects of “An Overview and Statistical Compendium of Freight Transportation in Alberta”. The topics covered include: an overview of the road, rail, air, pipeline, port systems serving Alberta’s freight transportation and trade; examples of user-friendly tables and charts; a review and discussion of data deficiencies and gaps, and suggested methods for keeping the report updated.

### **3.1 Road Congestion and Emissions**

*Dorothy Yen, Jean Andrey and Clarence Woudsma - Truck drivers’ perspectives on vehicle idling* - This study provides insight into line-haul drivers’ idling perceptions of both idling behaviour and associated initiatives by the Canadian government and employers to reduce idling. More than half the participants drive for companies that have a no-idling policy, over 2/3 of the drivers have an anti-idling device installed, and a majority of them report little idling behaviour. No clear relationship between truck drivers’ idling frequency, on-board anti-idling devices and level of environmental concerns is found.

*Michelle Ruddy, Lindsay Matthews and Tania Del Matto - Analyzing engine idling reduction opportunities at three Ontario ski resorts* - The goal of this study is to provide data on the current state of engine idling behaviours at ski resorts, while aiming to reduce climate-altering greenhouse gas emissions and improving air quality by undertaking initiatives that reduce engine idling among ski resort staff and visiting drivers. The pre and post-launch phases were studied and a substantial decreases in CO<sub>2</sub> emissions were found after the distribution of promotional materials after the pre-launch phase.

*Samah El-Tantawy and Baher Abdulhai - Self-Learning Acyclic Adaptive Traffic Signal Control* - In this paper, Reinforcement Learning (RL), an

Artificial Intelligence (AI) technique that emerged from machine learning, is used to solve the closed-loop optimal traffic signal control problem. A Q-Learning algorithm is developed for multiphase intersection to minimize the experienced vehicle delay. The learning algorithm yields a control law that maps system state to optimal control actions. Different Q-Learning models are developed to address different network state definitions. The algorithm is evaluated on a simulation and the proposed control system is compared. The Q-Learning control system consistently outperformed the pre-timed signal control under different traffic conditions, reducing delay by as much as 50%.

### **3.2 Marine Transport**

*Philip John, James S. Christie and Michael C. Ircha - Places of Refuge for Ships in Need of Assistance in Canada: Policy Lessons Learned from Other Major Maritime Nations* - Developing a policy for places of refuge for ships in need of assistance is prudent if Canada is to continue to be a major player in world trade. This study reveals the need for developing a risk assessment procedure for Canadian ports and for creating a unified and coordinated command and control structure for rapid and effective decision-making. Canada's existing administrative framework can be modified to meet the challenges of growing maritime trade, especially in fossil fuel products.

*Marc-André Roy and Peter Harrison - Short Sea Shipping in Canada: Lessons Learned and Research Model for the Development of New Services* - This paper will outline the key findings from recent studies by a Canadian company, CPCS, which focus on informing policy discussions on the integration of marine transportation in regional multimodal transportation systems. Of particular relevance, CPCS developed a research model that can be applied to any region with access to a sea port to assess opportunities for shifting relevant transportation flows to the marine mode on a competitive basis.

*Riad Mustafa, Ming Zhong and Michael Ircha - Short Sea Shipping in Canada: Regulatory and Policy Issues* - Short sea shipping is being looked at as a mode choice to alleviate congestion, to improve the utilization of the waterway system, and to develop trade. Short sea shipping is facing serious barriers and deteriorating port infrastructure. This paper conducts an extensive review in relation to domestic and international marine regulatory policies in the US and Canada to see how they interact with the promotion and development of short sea shipping in North America. It then focuses on

the challenges and obstacles faced by short sea shipping and identifies a list of actions governments must take.

### **3.3 Safety and Dangerous Goods**

*Garland Chow, Jinwoo Lee and William G. Waters II - Exploratory Evaluation of Commercial Vehicle Inspection Technologies in British Columbia* - This paper addresses the issue of what technologies can be adopted to affect the choice of trucks to be brought in for inspection and those that can bypass the inspection station - as it involves delays resulting in costs. If low risk vehicles could be identified and not delayed, this would save time for the vehicles and make inspection more effective by concentrating on higher risk trucks. Two technologies are evaluated together with their benefits and costs.

*Michèle Provencher - Risk Analyses in the Rail Transport of Dangerous Goods: How to Best Avoid Releases* - The Transport Dangerous Goods Directorate, conducts risk analyses of the transportation of dangerous goods by mode, such as a survey of the coupling speeds in hump yards to evaluate the applicability of imposing a speed limit, establishing the reliability of pressure relief valves and girth seams in railcars with a view to an alternative re-qualification interval, or establishing the probability that the width of a derailment would exceed a certain distance from the main track. A summary of the volume of dangerous goods transported in Canada by rail is presented along with accident statistics.

*Kube Douglas - Air Canada's Pilot Health Program – A commitment to safety and employee engagement* - Many disorders that may end a pilot's career are preventable with early identification and lifestyle modification. The author describes health risks to pilots, a leading occupational health program run by Air Canada, along with its link to safety and employee engagement. Air Canada's pilot health program not only ensures compliance with aviation regulations but also helps prevent disease, supports safe operations, contains costs associated with absenteeism and improves emotional connectedness to the company.

*Hossam Abdelgawad and Baher Abdulhai - Planning for Emergency Evacuation: Are Large Canadian Cities Ready?* - Planning for emergency evacuation situations in the City of Toronto is the subject matter of this paper. The authors propose six questions to demonstrate the readiness of city

planners and officials to plan for large-scale emergency evacuation. The results are found encouraging in terms of system performance. One potentially critical dimension that needs further research is user equity, which may have a direct bearing on compliance.

#### **4.1 Freight Logistics**

*Blair Sherwood and Barry E. Prentice - Airship Logistics Centres: The 6<sup>th</sup> Mode of Transport* - Until the 1960s, cargo on airplanes was strictly a by-product of passenger transport, and only in the past decades have dedicated cargo airports become established. The authors explore the ground handling and cargo exchange needs of a new generation of airships as almost no literature exists on this topic. They are of the opinion that airship cargo centres are likely to emerge over the next two decades and they consider such aspects as location, configuration and operations.

*Juergen K. Bock, Uwe Apel and Barry E. Prentice - Forestry Transport: Concept for Autonomous Unmanned Airship Logging* - The authors describe the layout of a lighter-than-air cargo carrier for autonomous unmanned operation in forestry. The system requires coordination of a ground system for UAV-type (unmanned aerial vehicle) monitoring and control, weather forecasting and physical operations. For economic and ecological reasons, hydrogen gas is proposed for both vehicle structure and fuel in combination with liquefied methane. The method of externally suspending payloads and expedient cargo exchange are explained. It concludes with a technology development plan.

*Paul Jakubicek and Clarence Woudsma - Logistics Locations in the GTA: Context and Industry Perspectives* - This research attempts to identify where logistics activity is occurring within the GTA, and to explore which factors are influencing patterns of locations. Also, the extent to which congestion related uncertainties in travel times are changing the supply chain network design of local firms is explored. Two methods are used to undertake this study. First, locations of DLW(Distribution, Logistics and Warehousing) firms within the GTA are identified and their spatial characteristics analyzed. Secondly, interviews are carried out to determine the range and importance of factors influencing their location decisions.

*Louis A Le Blanc and Laura A Valentine - Freightquote.com: Value Added Intermediation in Transportation* - This paper is a case study in the

application of internet technology in the transportation brokerage industry. The focus of the study is the value of network on brokering by enlarging the network of shippers and carriers, service as well as infrastructure operations. It allows for a larger scale of the network, wider geographic scope and faster compounding of network externalities. It also describes its competitive advantage through the use of superior technology.

#### **4.2 Industry Competition and Market Structure**

*Joseph Monteiro and Benjamin Atkinson - Container, Container Shipping Trends and Implications* - The 'box that changed the world' has attracted attention in the last few years. This is more because of the shortages in port infrastructure and containers throughout the globe. The effects of containerization have had a major impact on world trade. This paper reviews the container shipping industry, its history, and structure together with the trends in container, ship size and implications. Then regulations that affect the movement of containers and container shipping companies are examined with implications of the container shipping industry becoming oligopolistic.

*Joseph Monteiro and Gerald Robertson - Railways in Canada and the Experience with Regulatory Reform- With Emphasis on the Competitive Provisions* - Railways in Canada have played a particularly important role in Canadian history. It laid the foundation for economic growth and prosperity. It still forms the backbone of transportation services in Canada and accounts for as much as 18% of the transportation sector. This paper examines: the structure of the railways in Canada; regulation of the railways in Canada both before the deregulation era and after reforms were introduced and the experience of regulatory reforms in Canada with particular emphasis on competition.

*Joseph Monteiro - Do Airports Compete?* - Whether airports compete has attracted the interests of several groups. It has also evoked a great deal of emotion from those seeking increases in airport charges and those who oppose them. This paper reviews recent developments, outlines the most common issues raised in defining airport markets, and how airport markets have been defined UK and Australia. Thereafter, the central issue whether airports compete is examined by reviewing the experiences in UK and Australia, together with an examination of academic literature and an industry study.

*Darryl Anderson and Joseph Monteiro - Marine Container Terminal Operators: the Extent of Competition* - Marine container operators are key players in supporting the growth of world trade and in port competitiveness. Recently, consolidation of marine port terminals has stimulated further interest in this subject. Before the recession, the container shipping industry faced a global capacity crunch which together with the high and stable rate of return made terminals more attractive to investors. This paper basically examines marine terminal operators in Canada, their market share, the extent of competition and regulations that affect them. It then briefly examines, the experience and situation in a few countries.

#### **4.3 Transportation Modelling**

*Lina Kattan, Khandker Nurul Habib, Md. Tazul Islam and Nadeem Shahid - Information Provision and Drivers' Compliance to ITS (information technology service) application: Case Study on Variable Message Sign and Other Sources of Traffic Update in Calgary, Alberta* - The authors examine how the familiarity of different mediums of information affect drivers' understanding of the transportation system and thereby defines their response to ITS technology. This paper uses Deerfoot Trail in Calgary as a case study. The findings from this study enhances our understanding of drivers' response to ITS technology and helps in devising an efficient system.

*Alex Anas and Robin Lindsey - Road Pricing, Public Transport and Market Structure* - Since benefits from road pricing and public transport are interdependent, tolling and public transport supply decisions should be coordinated. However, a number of toll roads and public transport systems around the world are operated by private entities with goals of maximizing profits rather than overall transport system efficiency. To examine these market structure considerations, this paper develops a model where commuters choose between driving and taking a bus. Four regimes are considered.

*Hanna Maoh, Mark Ferguson, Pavlos Kanaroglou and Matthew Roorda - A New Approach for Estimating Establishment-Based Origin-destination Trip Matrices for Urban Commercial Vehicle Movements* - In this paper the authors propose and examine a robust method for generating establishment based origin-destination trip matrices that can be used to study urban commercial vehicle movement in large urban regions. A microsimulation

tour-based commercial vehicle movement model from Calgary, Alberta is adapted to examine the Greater Toronto and Hamilton Area. Some preliminary results including the evaluation of the generated results are provided and discussed.

*Nilesh Anand, Ron van Duin and Lori Tavasszy - Multi agent modeling for city logistics policy analysis: potentials and challenges* - This paper explains how effectively the multi agent system can be used to replicate the process of city logistics in modeling the details of urban freight movement. It discusses potentials of a multi agent system for city logistics in mapping complexity of domain, time and discipline. With the interactions between different stakeholders there emerges a behaviour which is difficult to predict in classical methods but can be effectively simulated in a multi agent system. Along with emergent behaviour, flexibility and natural description are other potentials that are discussed in this paper focusing on city logistics policy analysis.

### **5.1 Motor Vehicle Safety II**

*Mohammad Shafayat Hossain, John Douglas Hunt and Richard Tay, - Students' Perception of Pedestrian Risk* - The aim of this study is to explore student's perception of pedestrian risk and the factors associated with it. An additional aim is to assess students' preference of various pedestrian facilities. A questionnaire survey was conducted among University of Calgary students, and a total of 165 samples were collected. Results show that risk perception varies significantly with student's age, driving license availability, ethnic identification of the students, and the average weekly walk duration of the students. In addition, push button crossing facility is found to be the most preferred of the pedestrian alternatives.

*Sabreena Anowar, Shamsunnahar Yasmin and Richard Tay - Analysis of Holiday Crashes in Alberta* - This research aims to shed some light on the characteristics of the accidents occurring on the holidays on Albertan roadways and attempts to find out if these accidents are significantly different from the non-holiday period accidents. Chi-square test of statistical significance was applied for the purpose, using the accident data for the years 2004-2006. In addition, a binary logistic regression model was also applied. Their study showed that road type, lighting condition, point of impact and driver gender are the important determinants of the injury holiday crashes in Alberta.

*Shakil Mohammad Rifaat, Richard Tay and Alex de Barros - Effect of Neighbourhood Street Pattern on Motorcycle Crash Severity at Calgary* - The objective of the study is to explore the influence of street pattern on motorcycle crash injury in the City of Calgary. Four ordered response models were estimated using crash data for the years 2003-2005. Could the main finding be sensitive to different econometric models used? To capture the confounding effects, control variables are incorporated in the models. This study will help policy makers, engineers and planners.

## **5.2. Policy and Transportation Trends**

*Emily Bates, Philip Cartwright and Nick Mulder - Macro Trends-Transport Impacts* - The authors describe the ongoing shift of the economic centre of gravity to Asia, the relative declining power of the US and Europe as global powerhouses and the lack of major urban centres. In response to slow growth in transportation and financial constraints and the need for urban-centred growth, this paper outlines suggested public policies for long-term strategic planning and funding for urban transit and intercity highways, revitalization of bus and rail passenger systems, fostering Canada-US cross border alliances in the rail, truck and air sectors, and steps for international Open Skies and airline mergers.

*Paul D. Earl - Policy Failure or Legal Failure? The Case of Logistical Control of Western Grain* - This paper examines the Canadian Wheat Board's (CWB) regulatory powers over transportation. Firstly, it argues that the legislative provisions that provide the CWB with the power to control transportation were written for circumstances that no longer exist. Secondly, it argues that the history of the so-called "car allocation" system supports the thesis that, since about 1970, these legislative provisions have not given the CWB the necessary authority to control grain logistics in the way that they have done.

*Paul D. Earl - The 1996-97 Grain Transportation Failure: A History; A Critique; and the Perspective Ignored by the CTA* - One of the more spectacular failures in the history of Canadian transportation was the breakdown in grain movement in the winter of 1996/97. In its wake, the Canadian Wheat Board successfully pursued a "level of service" case with the Canadian Transportation Agency (CTA). This paper reviews that failure and the CWB's complaint, discusses why the CTA's decision was so

dramatically flawed, and presents a perspective on the breakdown that was submitted to, but completely ignored by, the Agency.

### **5.3 Transport Economics**

*Ana Yanas - Depreciation of Light Duty Vehicles: Evidence from the Canadian Red Book* - The author builds a dataset on depreciation from regular records of the market value of private vehicles and presents findings from this unique analysis tool. The depreciation cost is analyzed by type of vehicle, by province of registration, and by vehicle age.

*Benjamin Atkinson and Joseph Monteiro - Maritime Industries - Are They Becoming More Concentrated?* - Increases in concentration usually attract attention as was recently the case when consolidation swept the maritime industries. These mergers have raised questions among a number of observers? How will they affect rates, choices and competition? Are there barriers to entry in the industry? Will it affect the entry of new competitors in maritime industries? These questions are examined together with the economic meaning of concentration, the structure of various maritime industries, mergers and views of antitrust authorities.

*Robert McKinstry and Fares BouNajm - Investigating the Economic and Social Benefits of Public and Private Investment in Short Line and Regional Railway Infrastructure* - The objective of the paper is to investigate future economic and social benefits of public and private investment in the short line and regional railway system. To quantify potential economic and social benefits, the paper will draw on the existing work. The outcome of this paper is intended to demonstrate the importance of short line and regional railways and to assist future policy decision making for investment.

### **6.1 Mode Choice**

*Khandker M. Nurul Habib and Hamid Zaman - Effects of Incorporating Latent and Attitudinal Information in Mode Choice Model* - This research exploits the hybrid choice modelling approach to investigate how much improvement can be achieved by integrating stated preference information in mode choice model estimation. The authors use commuter survey data obtained from the City of Edmonton employees in 2008. The survey collected revealed mode choice as well as some stated preference information.

*Sundar Damodaran - Commute Distance and Policy Implications* - The author begins with a trend analysis for the Greater Toronto and Hamilton Area, exploring spatial statistics in terms of workers' place-of-residence, place-of-work, and the linkage between them. The author then focuses on the housing prices and local tax rates between various municipalities in the region. The trend analysis will lead to a case study which encourages local regional municipalities to undertake an in-depth analysis of workers' mobility and other variables such as housing price and tax rates. It also presents policy implications.

*Amjad Khan, Lina Kattan and Richard Tay - Policies to Promote Sustainable Transportation in Calgary* - In examining the effects of policy related variables on commuter modal choice, the authors use structural equation modeling (SEM) to link attitudinal variables (latent variables) and respondents' characteristics to mode choice. The effects on mode choice of changes in eleven variables (both latent and exogenous variables) were considered. The SEM identified six important policy variables or groups of manifest variables.

## **6.2 Surface Transport**

*Barry E. Prentice, Charles Mossman and Adam van Schijndel - Taxi Fares and the Capitalization of Taxi Licenses* - This paper undertakes a regression analysis of taxi cab licence values and changes in the regulated fares in Manitoba from 2000 to mid-2009. The capitalization of taxi licence values and changes of fees in Winnipeg is used to illustrate the inefficiency of the current system. This supports the authors case for deregulating the taxicab industry in Winnipeg.

*Joseph DiJohn and Jillian Tenebrini - Chicago's CREATE Rail Program: A Successful Public-Private Partnership* - The paper will review the Chicago Region Environmental and Transportation Efficiency Program's origin, the challenges in obtaining funding, development of the priority projects for investment, construction progress, the resulting improvements in the region's freight and passenger operations and the overall impact on the region. The project will reduce rail travel times and improve freight and passenger efficiency by investing in infrastructure improvements in the Chicago metropolitan area.

*Ehsan Jafari, Amin Ramezani, Behzad Moshiri, Karim Salahshoor, Baheer Abdulhai - Adaptive Freeway Traffic State Estimator Based on Measurement*

*Fusion Method* - The purpose of the reported real-data testing (of a real-time freeway traffic state estimator) is, first, to demonstrate some drawbacks in previous methods, second, to propose two methods based on dual filtering and measurement fusion to improve the previous methods. The main conclusions of the simulations are: 1. In previous methods, due to using one filter for state estimation of two different systems, the estimator result may be unacceptable; 2. State estimates of both systems in dual filtering approach, are unbiased and acceptable, but performance of the estimators is very sensitive to selected segment for estimation of the model parameters; and 3. In dual filtering based on Optimal Weighting Measurement Fusion (OWMF) method, fused speed and density of all segments are applied to estimate model parameters by one separate EKF from that used to estimate traffic variables, which its performance index is better than dual filtering in the best case.

### **6.3 Urban Transport**

*Sybil Derrible and Bilal Farooq - The Four Outcomes of Transit and Land-Use* - Transit investment has positive impacts on land-use development. These impacts are neither systematic, nor evenly distributed through the system. The authors then distinguish four types of neighbourhoods: urban-sprawled, compact, laissez-faire and strategic. They then indicate that effort should be put into forecasting the possible outcomes of planning new transit lines in order to be able to steer land-use development in the desired direction in Toronto.

*Leonardo J. Basso, Cristian Angelo Guevara, Antonio Gschwender and Marcelo Fuster - Congestion Pricing, Transit Subsidies and Dedicated Bus Lanes: Efficient and Practical Solutions to Congestions* - The authors analyze urban congestion management policies through numerical analysis of a simple binomial logit model that: allows users to choose between car or transit; considers congestion interactions between cars and buses and in bus stops; and allows for optimization of frequency, vehicle size, spacing between stops and percentage dedicated to bus lanes. The results are discussed together with the distributional aspects of policies.

*Richard M. Soberman - Making Transit Work – The Main Ingredients* - The author indicates that three things must happen if the delivery of public transit services is really going to be transformed to meet expectations. First, changes in governance models are needed; second, financial models are needed; and finally, it is probably time to take a serious look at compensation schemes.