



# SMART FREIGHT CENTRE

PRESENTS

November 20 & 27, 2020  
9:00 am – 12:00 pm



## THE 2020 SMART FREIGHT SYMPOSIUM VIA ZOOM

HOSTED BY THE  
LASSONDE SCHOOL  
OF ENGINEERING

# 2020 SMART FREIGHT SYMPOSIUM

Industry Session, November 20, 2020

9:00	Opening Remarks	Amir Asif	Vice-President, Research, York University
9:05	Welcome	John E. Moores	Associate Dean, Lassonde, York University
9:10	Introduction to the Smart Freight Centre	Peter Park	Associate Professor, Lassonde, York University
Session 01: Challenges in Freight Transportation (Moderator: Judy Farvolden)			
9:20	GGH Transportation Plan	Michael Casey	Manager, System Policy Office Ontario Ministry of Transportation
9:30	Canadian Centre on Transportation Data	Michael Scrim	Assistant Director, Statistics Canada
9:40	Logistics Challenges Faced Over the Pandemic	Sebastian Prins	Director, Government Relations, Retail Council of Canada
9:50	Q & A for Session 01		
10:00	Break		
Session 02: Plans for Future Freight Transportation (Moderator: Todd Letts)			
10:10	Keynote Address	Hon. Prabmeet Singh Sarkaria	Associate Minister of Small Business and Red Tape Reduction, Ontario
10:15	Goods Movement Progress	Nando Iannicca	Chair, Region of Peel
10:20	Urban Freight Electrification in the Greater Toronto and Hamilton Area	Maddy Ewing	Analyst, Pembina Institute
10:30	Walmart Canada Alternatively Fuelled Fleet 2028	Aaron Ritter	Director, Walmart Canada
10:40	The City of Toronto's Freight and Goods Movement Strategy	Nazzareno Capano; Adrian Lightstone	Manager, City of Toronto; Senior Consultant, WSP
10:50	Q & A for Session 02		
11:00	Break		
Session 03: Smart Freight Centre Research Update (Moderator: Merve Bodur)			
11:10	Smart Freight Centre Data Warehouse Update	Hasan Bayanouni	Research Associate, University of Toronto
11:20	Air Quality and Health Benefits of Greening Freight Movements	Laura Minet	Postdoctoral Fellow, University of Toronto
11:30	McMaster University Research Update	Heider Al Mashalah	Ph.D. Candidate, McMaster University
11:40	York University Research Update	Kevin Gingerich	Assistant Professor, York University
11:50	Q & A for Session 03		
12:00	Closing Remarks	Matthew Roorda	Professor, University of Toronto



# 2020 SMART FREIGHT SYMPOSIUM

Academic Session, November 27, 2020

9:00 Welcome Louis-Paul Tardif Director, Transport Canada

## Session 01: Current Issues in Freight Transportation (Moderator: Mehdi Nourinejad)

9:10	E-commerce Logistics Impacts on Communities	Heider Al Mashalah	Postdoctoral Fellow, McMaster University
9:20	Intelligent Truck Utilization	Soha Saiyed	M.Sc. Candidate, York University
9:30	Impact of Truck Signal Priority on Major Arterials	Ravi Rampure	M.Sc. Candidate, York University
9:40	Mobile Locker Storage Locations and Allocations	Si Liu	Ph.D. Student, McMaster University
9:50	Q & A for Session 01		

10:00 Break

## Session 02: Future Freight Transportation (Moderator: Glareh Amirjamshidi)

10:10	Assessing the Use of Autonomous Ground Vehicles for Parcel Delivery in a Mall	Daniel Olejarz	M.A.Sc. Graduate, University of Toronto
10:20	Impact of Truck Platooning on Two-Lane Rural Highways	Tanvir Chowdhury	Ph.D. Candidate, York University
10:30	Assessing Safety Interactions Between Trucks and Vulnerable Road Users Using a Truck Simulator	Alia Galal	Ph.D. Candidate, University of Toronto
10:40	Multimodal Autonomous Last-Mile Delivery System: Design and Applications	Mehdi Meshkani	Ph.D. Candidate, Ryerson University
10:50	Q & A for Session 02		

11:00 Break

## Session 03: Supply Chain and Logistics (Moderator: Elkafi Hassini)

11:10	Last-Mile Delivery with Crowd-Shipping and Mobile Depots	Kianoush Mousavi	Ph.D. Candidate, University of Toronto
11:20	Blockchain Based Distributed Smart Mobility Data-Markets	Ranwa Al Mallah	Postdoctoral Fellow, Ryerson University
11:30	Optimization of Mobile Robots Warehouse Fulfillment Systems	Yanling Zhuang	Research Assistant, McMaster University
11:40	Long Haul Truck Route Choice Modelling	Syed Ubaid Ali	M.Sc., York University
11:50	Q & A for Session 03		

12:00 Closing Remarks Gurpreet Singh Dhillon Region of Peel Councillor



# 2020 SMART FREIGHT SYMPOSIUM

November 20 & 27, 2020

## PRESENTERS A - Z

**Ranwa Al Mallah** received her Ph.D. degree in Computer Science from Polytechnique Montreal, Canada. She is currently a Postdoctoral Fellow at Ryerson University. She worked in the security of cyber-physical systems with the SecSI Research Laboratory, University of Montreal. In her previous research on vehicular networks and traffic safety and efficiency applications she applied artificial intelligence techniques to solve different problems in this field of application. Her current research goal is to develop multidisciplinary, secure and highly intelligent solutions for the planning, design and operation of cyber physical systems in the context of smart cities.

**Heider Al Mashalah** is a Research Engineer with the Smart Freight Centre at McMaster University. He brings a combination of operations management knowledge and practical experience. He holds Master of Science in Industrial Systems Engineering and will be starting his Ph.D. in Computational Science and Engineering at McMaster University. His primary research focus is in the areas of supply chain big data optimization and e-commerce last mile delivery.

**Syed Ubaid Ali** is a 2nd year Civil Engineering M.A.Sc. student at York University. Under the supervision of Dr. Kevin Gingerich, Ubaid is specializing in transportation engineering with a focus in freight route planning. He completed his B.A.Sc. in Civil Engineering at the University of Waterloo in 2016 and has two years of transportation planning experience at WSP Canada.

**Glareh Amirjamshidi** Ph.D., P.Eng., is a senior transportation engineer at Parsons with academic, research and practical hands-on experience in freight planning, logistics, e-commerce impacts on transportation, and urban freight modelling and optimization. She possesses in-depth knowledge in microsimulation applications, and systematic approaches to statistical data analyses. Glareh has also worked on several of the Smart Freight Centre projects as part of her postdoctoral research from 2017 to 2019. Glareh also serves as a board member of the Canadian Transportation Research Forum and PointA, and TRB's standing committee on Environmental Analysis and Ecology.

**Amir Asif** is Vice-President, Research at York University. Professor Amir Asif took office as York University's Vice-President Research & Innovation in May 2020. Asif was already well known to members of the York community, having served as the founding Chair of the Department of Electrical Engineering and Computer Science (EECS) from 2006 to 2014, Chair of Senate Subcommittee of Academic Standards, Curriculum and Pedagogy Committee (ASCP) from 2009 to 2012, and Vice-Chair of University Senate from 2010 to 2011. He has more than 15 years of experience serving in senior university leadership positions. Most recently, he was the founding Dean of the Gina Cody School of Engineering and Computer Science at Concordia University, where he developed the 2016-21 School's Strategic Plan, Inspiring a New Generation of Engineers and Computer Scientists, and the creation of faculty research support and capital infrastructure funds focused on attracting the best researchers and achieving excellence in research.



# 2020 SMART FREIGHT SYMPOSIUM - PRESENTERS A - Z

**Hasan Bayanouni** has 13 years of experience in the ICT industry. He received his B.Sc. in Computer Engineering from Ajman University in 2003. In 2017, he received his Ph.D. from University of Salford, UK. He is a postdoctoral fellow in the Department of Civil and Mineral Engineering at the University of Toronto. He led the (iCity-ITSoS) project which is part of the iCity-ORF project. He is working with the Smart Freight Centre on the Freight Data Warehouse and Data Analytics Solutions. Dr. Bayanouni worked in the industry as IT infrastructure engineer and solution architect. He led mega projects in the ICT infrastructure. He also led mega projects in the Smart Cities domain. He is focusing on the big data, data analytics, IoT Solutions and Smart Cities Solutions.

**Merve Bodur** is an Assistant Professor in the Department of Mechanical and Industrial Engineering at the University of Toronto. She also holds a Dean's Spark Professorship in the Faculty of Applied Science and Engineering. She is a faculty associate of University of Toronto Transportation Research Institute, Smart Freight Centre, and Centre for Healthcare Engineering at the University of Toronto. She obtained her Ph.D. from University of Wisconsin-Madison and did a postdoc at Georgia Institute of Technology. She received her B.S. in Industrial Engineering and B.A. in Mathematics from Bogazici University, Turkey. Her research interests include stochastic programming, integer programming, multiobjective integer programming and combinatorial optimization, with applications in a variety of areas such as scheduling, transportation, power systems, healthcare and telecommunications

**Naz Capano** is the Manager of Transportation Policy and Innovation in Transportation Services with the City of Toronto. He has over 30 years of experience in areas focused on infrastructure asset management, traffic and road operations, transportation policy and environmental initiatives related to climate change and adaption. Naz has guided a variety of strategic initiatives that include: the development of testing protocols for street sweepers; examination of tolling on the Gardiner Expressway and DVP; the development of a Free-Floating Car-Share Policy; Curbside Management Strategy; and most recently, Toronto's Freight and Goods Movement Strategy, to name a few. Naz is a graduate of the University of Toronto with B.Sc. degree in Civil Engineering.

**Michael Casey** (known as "Casey") is the manager of the System Policy Office at the Ministry of Transportation, which is responsible for the Ministry's freight policy portfolio. Casey has worked in the Ontario Public Service for 20 years. Over the last 16 years he has been working in various planning and policy roles at the Ministry of Transportation.

**Tanvir Chowdhury** is currently a Ph.D. student in the Department of Civil Engineering, Lassonde School of Engineering, at York University. He is working under the supervision of Dr. Peter Y. Park. Tanvir has completed his master's degree in Civil Engineering in 2016 from Islamic University of Technology (IUT). He has four years of industry experience in ADB, JICA, and World Bank Funded Infrastructure Development projects. Before joining Lassonde, he worked as a Road Design Engineer & Technical Project Coordinator in Snowy Mountain Engineering Corporation (SMEC). He was the President of CITE YorkU in 2019-20 and its Events Director in 2018-19. As President, Tanvir won CITE Outstanding Student Chapter of the Year Award 2020. He was a winner of CARSP Poster Presentation Competition 2019 as well. Tanvir is currently a registered EIT of Professional Engineers Ontario.



# 2020 SMART FREIGHT SYMPOSIUM - PRESENTERS A - Z

**Gurpreet Singh Dhillon** is the Regional Councillor for Brampton's Wards 9 & 10, and represents approximately 160,000 residents at both the City of Brampton and Peel Region councils. With a significant number of Brampton's 11,000 truck drivers residing in his wards, Councillor Dhillon has been a staunch proponent for the transportation industry. Councillor Dhillon has been consistently advocating for better working conditions for these individuals since first taking office. He actively works for the community, businesses and residents in order to make Peel a "community for life" and supports its local economy. After hearing from the residents he serves, Councillor Dhillon took on the role of working diligently with the Peel Goods Movement Task Force to ensure safe and efficient movement of goods and people within Brampton.

**Maddy Ewing** is an analyst at the Pembina Institute, Canada's leading clean energy think tank. In her role, she leads research and engages key stakeholders to better understand the barriers and opportunities associated with a wide range of low-carbon solutions for Canada's on-road freight sector, including demand management, fuel switching and fuel efficiency practices. Prior to joining the Institute, Maddy completed a Master of Applied Science degree at the University of Toronto in the Department of Civil & Mineral Engineering where her research focused on evaluating low-carbon alternatives to diesel fuel for long-haul trucking in Canada.

**Judy Farvolden** is Executive Director at the University of Toronto Transportation Research Institute. She holds advanced degrees in both engineering and planning and has had careers in logistics, technology and finance. She earned a Ph.D. from Princeton University in Transportation and Operations Research, with a dissertation that optimized freight consolidation in LTL operations. She ran professional services for a "Logistics-as-a-Service" company, in the cloud, location-based, real-time routing and scheduling of pick-up and delivery operations for clients across North America.

**Alia Galal** is a Ph.D. Candidate at the University of Toronto. She received her B.Sc. degree in Industrial Engineering from the Arab Academy for Science and Technology in Alexandria, Egypt in 2017. She is currently a second year Ph.D. student in the Civil Engineering department at the University of Toronto. Her Ph.D. research combines freight transportation, human factors and traffic safety as she analyzes truck drivers' skills and behaviour using a truck simulator. Her research aim is to improve traffic and vulnerable road user safety in Canada and worldwide.

**Kevin Gingerich** is an Assistant Professor in the Department of Civil Engineering at York University. Some areas of recent research include truck route choice, parking supply and demand, and infrastructure supporting long-combination vehicles. His research work has been disseminated in widely respected journals including Transportation Research Part C, Transportation Geography, and Transportation Research Record. In addition to his research and teaching, Kevin serves as the founding Faculty Advisor for the Institute of Transportation Engineers (ITE) York University Student Chapter.



# 2020 SMART FREIGHT SYMPOSIUM - PRESENTERS A - Z

**Elkafi Hassini** is a professor and chair of Operations Management at the DeGroot School of Business, McMaster University. He is also Vice Chair of the Smart Freight Centre, and Research Director for Supply Chain Analytics at the MiSCAN Lab, and an associate faculty member of the School of Computational Science & Engineering, and the eHealth program. He currently serves as a co-Editor-in-Chief of the journal INFOR: Information Systems and Operational Research, the flagship journal of the Canadian Operational Research Society (CORS). Among his current research projects are big data optimization in supply chains and last mile freight distribution and warehouse management.

**Nando Iannicca** was appointed Regional Chairman & CEO of the Region of Peel by Regional Council in 2018. Prior to his position as Regional Chair, Iannicca served as City & Regional Councillor for the City of Mississauga and the Region of Peel for 30 years. In his capacity as Chairman and Chief Executive Officer, Chair Iannicca represents the Region at official functions, promotes the Region when liaising with various levels of government, and presides over Regional Council meetings, providing leadership to Council and ensuring its decisions are implemented. During his career, the Chair has served on numerous boards, such as the Police Commission Board, Enersource/Hydro Board, and Credit Valley Conservation Board. Most recently, Iannicca served as Chair of the Peel Police Services Board in 2019 and remains a member of the Board. Chair Iannicca has also volunteered with the Trillium Hospital Foundation, Red Cross, Symphony Board, Salvation Army Red Shield Appeal, and Mississauga Food Bank, and is a Queen Elizabeth II Diamond Jubilee recipient for his 25 years of volunteer service.

**Todd Letts**, Chief Executive Officer for the Brampton Board of Trade, represents businesses that employ more than 45,000 in one of Canada's fastest growing and multicultural suburban communities. Highly respected by his peers, in 2019, Todd was elected as Canada's representative to the World Chambers Federation Governing Council of the International Chamber of Commerce. In 2020, he was appointed to the international Certified Chamber Executive Commission. That same year he was named to the Minister of Transportation for Ontario's Business Advisory Council for Transit in the Innovation Corridor. Todd is a Ford fellow in Regionalism & Sustainable Development, an honour bestowed by the United States Ford Foundation. Active in a number of economic development collaborations, he is a founding member of the Canadian Global Cities Council and Canada's Innovation Corridor Business Council.

**Adrian Lightstone** is the National Manager of WSP's Advisory Service practice. Adrian has a background in transport and freight economics. He has worked for public and private sector clients in Canada and the US including provincial, state, and federal agencies. Adrian has B.Sc.E. in Mechanical Engineering from Queen's University and a M.Sc. in Economics from the Royal Institute of Technology in Stockholm.



# 2020 SMART FREIGHT SYMPOSIUM - PRESENTERS A - Z

**Si Liu** joined the Ph.D. program in Management Science at the DeGroot School of Business, McMaster University in September 2019 and is advised by Prof. Elkafi Hassini. He holds a bachelor's degree in Process Equipment Engineering from Zhejiang University, China, a master's degree in Sustainable Energy Technology from the Royal Institute of Technology, Sweden and Technical University of Eindhoven, the Netherlands, and a master's degree in Mechanical Engineering from Michigan Technical University in the U.S. His current research interests include the application of novel transportation methods in last mile deliveries as well as sustainable supply chain technologies such as shared mobility.

**Mehdi Meshkani** is a Ph.D. student in the Transportation Engineering program at Ryerson University. He received his B.Sc. in Civil Engineering from University of Sistan & Baluchestan, Iran, and M.Sc. in Roads and Transportation Engineering from Tarbiat Modares University, Iran. He started his Ph.D. in 2018 under the supervision of Dr. Bilal Farooq. His research focuses on the development of on-demand shared mobility systems to optimally design city-scale ridesharing and ridehailing algorithms.

**Laura Minet** is a Postdoctoral Fellow in Earth Sciences and Civil & Mineral Engineering at the University of Toronto. She received her Ph.D. from the University of Toronto, her M.Sc. from McGill University, and her B.Eng. and M.Eng. from Ecole Centrale de Nantes (France). Laura works on a variety of projects looking at the impacts of traffic on greenhouse gas emissions, urban air quality, population exposure and health. Laura has recently collaborated with the advocacy group Environmental Defence as well as Ontario Public Health Association to highlight how electric vehicles and cleaner trucks can help reduce pollution, tackle climate change, improve health and save lives in the Greater Toronto and Hamilton Area.

**John E. Moores** is the Associate Dean of Research and Graduate Studies at the Lassonde School of Engineering and the York Research Chair in Space Exploration at York University. He obtained his bachelor's degree in Engineering Science (Aerospace) from the University of Toronto and a Ph.D. in Planetary Science from the University of Arizona's Lunar and Planetary Laboratory. He is a member of the Royal Society of Canada's College of New Scholars, Artists and Scientists. He has been a member of six space mission teams, most recently as a Participating Scientist on NASA's Mars Science Laboratory (MSL) Mission, popularly known as the Curiosity Rover. For his service on NASA missions, he and members of his research group have been awarded the NASA Group Achievement Award 16 times. An expert on planetary atmospheres, Moores has been an author on 81 peer-reviewed papers receiving over 6600 citations. Dr. Moores is the Director of the Technologies for Exo/Planetary Science NSERC CREATE Program, a member of the Canadian Space Agency's Planetary Exploration Consultation Committee and the Canadian Meteorological and Oceanographic Society's Scientific Committee.

**Kianoush Mousavi** is doing his Ph.D. in transportation planning under the supervision of Professor Matthew Roorda and co-supervision of Professor Merve Bodur at the University of Toronto. Kianoush's main research interest is on the application of mathematical programming in transportation problems. He is doing his Ph.D. thesis on crowd-shipping business models for improving last-mile delivery with a focus on decision making under uncertainty. Kianoush is also participating in the off-peak delivery project for the Region of Peel as the primary research analyst at U of T.





# 2020 SMART FREIGHT SYMPOSIUM - PRESENTERS A - Z

**Mehdi Nourinejad** is an assistant professor at the Civil Engineering Department of York University. He received his Ph.D. from the University of Toronto and was a Postdoctoral Fellow at the Rotman School of Management for two years. Mehdi's research focuses on optimal planning and control of transportation systems in smart cities with autonomous vehicles. He is the academic editor of *Journal of Advanced Transportation* and on the editorial board of *Transportation Research Part E: Logistics and Transportation Review*. His research on autonomous vehicles has received media coverage and is published in outlets including *Forbes*, *Fox News*, *MIT-News*, *University of Toronto Engineering News*, *Popular Science*, *Design Quarterly*, *Global News*, *Gizmag*, *Science Daily*, and *Tech Xplore*.

**Daniel Olejarz** is a recent M.A.Sc. graduate of the University of Toronto, currently working in transportation planning and analytics at IBI Group. Daniel's research is focussed on improving the efficiency of urban freight systems through the use of emerging technologies. His thesis involved collaborating with a major courier company operating in Canada to determine the implications of delivering parcels using autonomous ground vehicles.

**Peter Park**, P.Eng., is an Associate Professor in the Department of Civil Engineering at the Lassonde School of Engineering (LSE), York University since 2015. He serves as the Chair for the Scientific Advisory Committee of the Smart Freight Centre. His expertise includes transportation safety and security, intelligent transportation systems, transportation planning and advanced statistical analysis. Before joining LSE, he was a faculty member of the Department of Civil and Geological Engineering at the University of Saskatchewan (2008 to 2015). In addition to his academic experience, he has ten years of experience in national and international consulting as a transportation engineer and planner. Dr. Park serves as an Editorial Board Member for a few prestigious transportation journals including *Accident Analysis and Prevention* and *Analytic Methods in Accident Research*.

**Sebastian Prins** is Director, Government Relations of the Retail Council of Canada. He is an experienced government relations professional with a history of successful provincial advocacy for for-profit retail entities. Background includes experience in finance, with a financial analyst position at Edward Jones, and a thesis-based Master's degree, focused on sell-side analysts and earnings per share forecasts from Erasmus University Rotterdam.

**Ravichandra Rampure** is a master's student at the Department of Civil Engineering, Lassonde School of Engineering, York University. He completed his bachelor's degree in Civil Engineering from MSRIT, Bangalore, India. He is presently working as a Transportation Designer at Lea Consulting. He has over four years of industry experience as an Assistant Manager-Civil in Highway Construction and Planning with L&T TI IC, India. Currently, his research is focusing on developing a signal optimisation plan to reduce truck traffic congestion at selected signalised intersections on Dixie Road, Mississauga, Ontario.



# 2020 SMART FREIGHT SYMPOSIUM - PRESENTERS A - Z

**Aaron Ritter**, currently Director, Transportation Strategy at Walmart Canada has held progressive positions in Sales Management and Transport/Logistics for both Suppliers (Coca-Cola) and Retail (Walmart) over the last 18 years. He provides a proven track record of successfully bridging cross functional areas through innovative enterprise solutions. Aaron holds a Marketing Diploma from Mohawk College complimented with Queens/Smith School of Business - Design Thinking Program, Schulich School of Business – Lean Supply Chain Management and a Lean Six Sigma Green Belt Certification

**Matthew Roorda** has been a Professor of Civil Engineering at the University of Toronto since 2005, and a transportation engineer since 1998. He is the Canada Research Chair in Freight Transportation and Logistics and Chair of the Smart Freight Centre, a multi-university research centre. Dr. Roorda's research interests include urban freight transportation, freight planning and operations, freight and passenger survey methods, city logistics, parking, curbside management, emissions analysis, travel demand modelling, and firm behaviour.

**Sabbir Saiyed** is a Manager of Transportation System Planning at the Regional Municipality of Peel and one of the founding members of Smart Freight Centre. He has over 25 years of experience in progressively responsible positions in civil engineering, transportation and management. Apart from the Regional Municipality of Peel, Dr. Saiyed has enjoyed productive careers at the City of Markham, Regional Municipality of York, Royal Military College of Canada and the Regional Municipality of Ottawa-Carleton. He has a Ph.D. from the Royal Military College of Canada, a Master's degree in Civil Engineering from Carleton University, and is a Registered Professional Engineer in the Province of Ontario.

**Soha Saiyed** is a second-year Master's student in the Department of Civil Engineering at Lassonde School of Engineering, York University. She was Vice-President of the ITE-York University Student chapter in 2019-2020. Soha is currently working on intelligent lane utilisation measures including urban truck lanes on highways and arterials in the Region of Peel for the purpose of improving the efficiency of goods movement. Dr. Peter Park is her thesis advisor.

**Prabmeet Sarkaria** has the honour of representing his community as the Member of Provincial Parliament for Brampton South and serving the people of Ontario as the Associate Minister of Small Business and Red Tape Reduction. Before answering the call to public service, Prabmeet worked as a corporate and commercial Associate at Miller Thomson LLP. He earned his law degree from the University of Windsor as well as a Bachelor of Business Administration from Wilfrid Laurier University, where he majored in Finance. Prior to his legal career, he worked at TD Securities. Passionate about community, Prabmeet is an active volunteer. He served on the City of Brampton's Property Standards Committee as well as the Board of Directors for Hockey for Humanity and KarmaGrow. He is an avid sports fan who enjoys playing and watching hockey, basketball, baseball, and football. If you ever have the opportunity to visit his office, it will be impossible to forget who won the 2019 NBA Championship. Prab entered public service in order to be a strong advocate for hardworking families in Brampton South and all across the province he loves—and is committed to giving voice to the concerns of the everyday people he is humbled to serve.



# 2020 SMART FREIGHT SYMPOSIUM - PRESENTERS A - Z

**Michael Scrim** is currently the Assistant Director of the Centre for Tourism and Transport statistics at Statistics Canada. He has worked at Statistics for 25 years in various roles and have been responsible for working with various stakeholders to deliver key data products. Additionally, he has been involved in many international work and committees representing the agency. He is currently leading teams in the transportation domain to look at improving and filling data gaps for freight movement. His education background are degrees in Business and Education.

**Louis-Paul Tardif** is Director at Transport Canada. Mr. Tardif developed the concept of measuring supply chains using a fluidity indicator, taking into account all modes of transport and from an end-to-end perspective. Prior to joining Transport Canada in 2007, Mr. Tardif was Principal of his own consulting firm.

**Yanling Zhuang** is a third-year Ph.D. student in Management Science. She joined DeGroote School of Business in September 2019 as a visiting student. Her primary research interests are in the fields of e-commerce and logistics management.

