

## LUIS F. MIRANDA-MORENO

### **Assistant Professor**

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Applied Mechanics  
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### **EDUCATION**

#### **Ph.D. in Civil Engineering - Transportation**

University of Waterloo, Canada, (2002- 2006).

Department of Civil and Environmental Engineering

Ph.D. thesis: *Models and methods for identifying hazardous locations for safety improvements*. Supervisors: Liping Fu and Frank Saccomanno.

#### **MEng in Transportation** (direct transfer into PhD program)

Department of Civil and Environmental Engineering

University of Waterloo, Canada, (2002- 2003).

#### **Master of Engineering in Transportation**

University "Autónoma del Estado de México", Mexico (1997-1999).

Department of Civil Engineering

Master's thesis: *Trip generation modeling for a medium-sized Mexican city*.

Supervisor: Eusebio Cardenas G.

#### **Bachelor of Civil Engineering**

University "Michoacana", Mexico (1992-1997).

## **WORK EXPERIENCE:**

*Aug. 2008 to present:*

### **Assistant Professor**

Department of Civil Engineering and Applied Mechanics, McGill University, Canada

**Activities:** i) Teaching undergraduate and graduate Civil Engineering courses, ii) supervising masters and PhD students, iii) developing transportation research activities and projects involving researchers and professionals in public agencies and local engineering firms, iv) fulfilling administrative activities, service to research committees and organization committees in civil engineering, etc.

*Sept. 2006 to Aug. 2008:*

### **Post-doctoral Fellow**

CDAT/CRAD, Laval University, Canada.

**Activities:** Participating in both individual and team projects related to transportation and environmental engineering financed by Canadian and US transportation agencies such as Transports Québec, Natural Resources Canada and New York State Department of Transportation.

*April 2008 to June 2008:*

### **Visiting Post-doctoral Researcher**

Laboratoire d'Economie des Transports, CNRS, Lyon, France.

**Activities:** Working in transportation research projects related to mobility and information and communication technologies (ICT).

*April 2005 to Sep. 2006*

### **Doctoral Internship**

Interdisciplinary Research Group on Mobility, Environment and Safety (GRIMES), Laval University, Canada.

**Activities:** Working in road safety projects for Transport Canada, Ontario Ministry of Transportation and "Société de l'assurance automobile du Québec".

*Sept 2002 to April 2005*

### **Research Assistant**

Transportation Group, Department of Civil Engineering, University of Waterloo, Canada.

**Activities:** Helping to develop a web-based decision support tool for hotspot identification and countermeasure analysis of Canadian highway-railway grade crossings for Transport Canada.

Sept. 1999 to Sept. 2002

**Associate Researcher**

Mexican Transport Institute, Ministry of Transport and Communications, Mexico.

**Activities:** Working on projects related to planning and design of a rail-road intermodal transportation system in Mexico as well as the evaluation of cargo capacity and saturation problems of Mexico-US road border crossings.

**TEACHING EXPERIENCE:**

**Courses offered at McGill**

- CIVE 319 - Transportation Engineering
- CIVE 540 - Urban Transportation Planning
- CIVE 546 - Transportation Safety Analysis

**Participation in other McGill courses:**

- CIVE 418 - Design Project
- CIVE 432 - Technical Paper
- URBP 636 - Transportation Seminar

**Teaching assistant at University of Waterloo:**

- Transport Principles and Applications (Fall 2003)
- Urban Transport Planning (Fall 2004)

**Lecturer at the School of Economics, University of State of Mexico:**

- Financial Mathematics (1999 -2001)
- Optimization Techniques (1999 -2001)

**CURRENT ASSOCIATIONS:**

- Member of CIRRELT, Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation.
- Member of CDAT, Centre for Data and Analysis in Transportation, Université Laval.
- Adjunct Professor, Department of Civil and Environmental Engineering, University of Waterloo
- Adjunct Professor, Department of Regional and Urban Planning, Laval University

## **AWARDS AND SCHOLARSHIPS**

- Postdoctoral Scholarship, Laval University, 2006-2008
- Doctoral Scholarship of the Transport Ministry of Mexico for Ph.D. studies: 2002-2006
- Graduate Scholarship, University of Waterloo: 2003-2005
- Civil Engineering Scholarship, University of Waterloo: Spring 2004
- International Graduate Student Award, University of Waterloo: 2002-2004
- Scholarship of the Transport Ministry of Mexico for Master's studies: 1997-1999

## **REVIEWER OF JOURNALS**

- *Accident Analysis and Prevention*, Springer
- *Canadian Journal of Civil Engineering*, NRC Research Press
- *Journal of the Transportation Research Board*
- *Journal of choice*

## **CURRENT COLLABORATIONS WITH OTHER INSTITUTIONS**

- *Texas A&M University, Dominique Lord* - Bayesian methods in road safety applications and co-authoring papers.
- *University of Waterloo, Liping Fu and Frank Saccomanno* – Working on safety and mobility impact of winter weather and road maintenance. Collaborating in research projects for Ontario Ministry of Transportation and Transport Canada. Co-authoring several papers and co-supervising graduate students.
- *Purdue University, Satish Ukkusuri*. Working on pedestrian safety issues. Collaborating in a project for the New York City Department of Transportation,
- *Laval University, Martin Lee-Gosselin and Philippe Barla*. Working on land use and transit strategies to reduce greenhouse gas emissions. Collaborating in research projects for Quebec Ministry of Transportation. Co-authoring several papers and co-supervising graduate students.
- *Harvard University, Walter Willett and Anne Lusk*. Working on cycling and safety facility designs. Co-authoring several papers.

## RESEARCH FUNDING

### a. Research Operating Grants and Equipment

Granting agency	Project title	Period	Amount	Role	Status
NSERC– discovery grant	“Modeling tools for analysis of safety and mobility of non-motorized transportation modes”	2009-2013	\$110,000.0	PI	Granted
FQRNT– new researcher and equipment	“Une méthodologie de modélisation intégrale pour l’analyse de la sécurité piétonne aux intersections urbaines”	2010-2012	\$58,000.0	PI	Granted
FQRNT – team grant	“Analyse empirique des relations entre formes urbaines, offre de transport en commun et émissions de gaz à effet de serre liées au transport des personnes dans le contexte urbain québécois”	2010 - 2013	\$145,000.0	PI	Granted
FQRNT – strategic network	“Réseau stratégique de recherche et d’innovation en sécurité routière”	2010 - 2015	\$500,000.0	Team member	Granted
CFI	“Leaders Opportunity Fund - An integral transportation safety laboratory for sustainable urban mobility”	2010-2014	\$200,000.0	PI	Granted
FQRSC – team grant (road safety program)	Cyclist safety improvement in urban Quebec: the role of road designs, built environment and traffic exposure	2011-2014	\$150,000.0	PI	Submitted
<b>Total:</b>			<b>1,163,000.00</b>		

**b. Research Projects financed by transportation agencies or firms**

<b>Project</b>	<b>Transportation agencies/firms</b>	<b>Period</b>	<b>Amount</b>	<b>Role</b>	<b>Status</b>
Ministère des Transports du Québec	Mobilité et changements climatiques: bilan et analyse des déterminants des émissions de gaz à effet de serre associées aux déplacements des ménages de la ville de Québec.	2008-2010	\$30,000.0	co-PI	Granted
Ministère des Transports du Québec	Étude concernant l'utilisation d'une ligne continue dans la zone d'influence de la sortie ou de l'entrée des autoroutes	2010-2011	\$32,000.0	PI	Granted
CIMA+	Document d'orientation - bureau de la sécurité des déplacements	2009-2010	\$20,000.0	PI	Granted
CIMA+	City of Montréal Speed limit Evaluation Study	2009-2010	\$15,000.0	PI	Granted
Ministère des Transports du Québec	Development of a Monitoring Program and Air Quality for Autoroute 25	2010-2013	\$160,000.0	PI	Granted
<b>Total:</b>			<b>\$257,000.00</b>		

**Summary of funding received and in revision from 2008 to Present**

<b>Role</b>	<b>Amount</b>
Principal investigator	Granted: <b>\$740,000.00</b>
	In process (submitted): <b>\$150,000.00</b>
Co-principal investigator	Granted: <b>\$30,000.00</b>
Team member	Granted: <b>\$500,000.00</b>

## LIST OF PUBLICATIONS

("Underline" denotes graduate student in supervision or co-supervision)

### **Published (or in press) refereed articles**

- a.1. Lusk A., Furth F., Morency M., **Miranda-Moreno**, Willett W., Dennerlein J. (*in press*) "Bicyclists' Crash and Injury Rates on Cycle Tracks in North America vs Bicycling in the Street". *Injury Prevention*.
- a.2. **Miranda-Moreno L.**, Morency, P., El-Geneidy A. "How does built environment influence pedestrian activity and pedestrian collisions at intersections? *Accident Analysis and Prevention (accepted)*.
- a.3. **Miranda-Moreno, L.**, Nosal T. "impact of weather on physically separated cycling facilities and temporal trends in an urban environment?" Paper submitted to *Journal of Transportation Research Record (accepted)*.
- a.4. **Miranda-Moreno L.** Fernandes D. "Pedestrian activity modeling: land use, urban form, weather and spatio-temporal trends", *Journal of Transportation Research Record (accepted)*.
- a.5. Sahaby A., Strauss, J., **Miranda-Moreno, L.**, Manaugh, K. Estimating the Potential Effect of Speed Limits, Built Environment and Other Factors on the Pedestrian and Cyclist Injury Severity Levels in Traffic Crashes. *Journal of Transportation Research Record (accepted)*.
- a.6. **Miranda-Moreno, L.**, Bettex, L., Zahabi A., Kreider, T., Barla P. (*first revision*) "A simultaneous modeling approach to evaluate the endogenous influence of urban form and public transit accessibility on distance traveled", *Journal of Transportation Research Record (accepted)*.
- a.7. Usman, T., Fu, L., **Miranda-Moreno, L.** (2010), "Quantifying safety benefit of winter road maintenance: Accident frequency modeling", *Accident Analysis and Prevention*, 42, pp 1878–1887.
- a.8. Manaugh, K., **Miranda-Moreno, L.**, El-Geneidy, A. (2010) "The effect of neighbourhood characteristics, accessibility, home-work location, and demographics on commuting distances", *Transportation*, 37, 627–646.
- a.9. Barla, P., **Miranda-Moreno, L.**, Savard, N., Thériault, M., Lee-Gosselin, M. (2010) "A disaggregated empirical analysis of the determinants of urban travel GHG emissions", *Journal of the Transportation Research Board (in press)*.

- a.10. Legay C., Rodriguez M.J., **Miranda-Moreno L.**, Sérodes J.B., Levallois P. (2010) Multi-level modelling of chlorination by-product presence in drinking water distribution systems for human exposure assessment purposes, *Environmental monitoring and assessment (in press)*.
- a.11. Proulx, F., Rodriguez M., Serodes, J., **Miranda-Moreno L.** (2010) Factors influencing public perception and use of municipal drinking water. *Water Science and Technology*, 10(3), 472-485.
- a.12. Young-Jin P. and **Miranda-Moreno L.F.** (2010), "Estimation of speed differentials on rural highways using hierarchical models", *Canadian Journal of Civil Eng*, 37(4), 624-637.
- a.13. **Miranda-Moreno L.**, Fu L., Lord D. and Ukkusuri S. (2009), "How to incorporate accident severity and vehicle occupancy into the hotspot identification process?", *Journal of the Transportation Research Records*. 2102, 53-60.
- a.14. Barla P., Lamonde B., **Miranda-Moreno L.**, and Boucher N. (2009), "Traveled distance, stock and fuel efficiency of private vehicles in Canada", *Transportation*, 36, 389-402.
- a.15. Lee-Gosselin M. and **Miranda-Moreno L.** (2009), "What is different about spontaneous urban activities that were planned with the aid of ICTs? Some early evidence from Québec, Canada", *Journal of Transport Geography*, 17, 104-114.
- a.16. Francisque, A., Rodriguez, M.J., **Miranda-Moreno, L.**, Sadiq, R. (2009) "Modeling of bacteria counts in a water distribution system", *Water Research* 43, 1075-1987.
- a.17. Montenegro, P., Rodriguez, M.J., **Miranda-Moreno, L.** Joerin, F., & Proulx, F. (2009) "Occurrence of citizen complaints concerning drinking water: a case study in Quebec City", *Journal of Water Supply: Research and Technology*, 58(4) pp. 257-266.
- a.18. Francisque, A., Rodriguez, M., **Miranda-Moreno, L.**, Sadiq, R.. (2009) Prioritizing monitoring locations in a water distribution network: a fuzzy risk approach" *Journal of water supply: Research and technology*, 58(7), pp. 488-509.
- a.19. **Miranda-Moreno, L.** and Lee-Gosselin, M. (2008). "A week in the life of baby boomers: how do they see the spatial-temporal organization of their activities and travel?" *Transportation*, 35(5), 629-653.
- a.20. Lord D., and **Miranda-Moreno L.** (2008), "Effects of low sample mean values and small sample sizes on the parameter estimation of hierarchical Poisson



models for motor vehicle crashes: a Bayesian perspective”, *Journal of Safety Science*, 46, 751-770.

- a.21. **Miranda-Moreno, L.**, Labbe, A., and Fu, L. (2007), “Multiple Bayesian testing procedures for selecting hazardous sites”, *Accident Analysis & Prevention*, 39(6), 1192-1201.
- a.22. **Miranda-Moreno L.** and Fu L. (2006), “A comparative study of alternative model structures and criteria for ranking locations for safety improvements”, *Networks and Spatial Economics* (6), 97–110.
- a.23. **Miranda-Moreno L.**, Fu L., Saccomanno F., and Labbe A. (2005), “Alternative risk models for ranking locations for safety improvement” *Journal of the Transportation Research Board*, 1908, 1-8.
- a.24. Saccomanno F., Fu L. and **Miranda-Moreno L.** (2004), “Risk-based model for identifying highway-rail grade crossing blackspots” *Journal of the Transportation Research Board* 1862, 127-135.

**Journal articles submitted (in revision):**

- a.25. **Miranda-Moreno L.F.**, Lord D. and Fu L., (*second revision*) “Bayesian road safety analysis: incorporation of past experiences and effect of hyper-prior choice” Paper submitted to *Journal of Safety Research* (December 2009).
- a.26. Barla P., **Miranda-Moreno, L.**, Lee-Gosselin, M. “Urban travel CO2 emissions and land use”. Paper submitted to *Transportation Research Part D* (July, 2010).
- a.27. Francisque, A., Rodriguez, M., Sadiq, R., **Miranda-Moreno L.** (*first revision*) “Classification of heterotrophic plate count (HPC) in a water distribution network: a fuzzy rule based approach”. Paper submitted to *Environmental Modelling & Software* (*submission date: July, 2010*).
- a.28. **Miranda-Moreno L.**, Strauss, J., Morency, P. (*first revision*) “Exposure Measures and Injury Frequency Models for Analysis of Cyclist Safety at Signalized Intersections”. Paper submitted to the *Journal of Transportation Research Record* (*submission date: July, 2010*).

**Published book chapters**

- b.1. **Miranda-Moreno L.F.** and Fu L. (2009), “Traffic Safety Study: Empirical Bayes or Full Bayes?” *Transportation Statistics*, edited by Brian W. Sloboda, J. Ross Publishing, Inc, 2009.

**Accepted or published proceedings/conference papers**

- c.1 Usman, T., Fu, **Miranda-Moreno, L.** (2010). "Modeling the severity of winter road collisions". 8th International Transportation Specialty Conference, Canadian Society of Civil Engineers, Winnipeg, Manitoba June 9-12, 2010.
- c.2 Usman, T., L. Fu, **Miranda-Moreno, L.** Perchanock, M. (2010). "A Multilevel Disaggregate Model for Quantifying the Safety Effect of Winter Road Maintenance". Paper presented at the 13th Winter Road Congress Meeting, Quebec City, Canada.
- c.3 **Miranda-Moreno**, Morency P., Zahabi A., Manauagh K. (2010). "Effect of speed limits, road design, land-use and other factors on crash severity levels involving non-motorized users and motor vehicles". *8th International Transportation Specialty Conference*. Winnipeg, Manitoba, June 9-12, 2010.
- c.4 Usman, T., L. Fu, **Miranda-Moreno** (2010). Accident Prediction Models for Quantifying Safety Benefit of Winter Road Maintenance. Paper presented at the 89th Annual Meeting of the Transportation Research Board, Washington D.C.
- c.5 Lee-Gosselin, M., **Miranda-Moreno, L.F.**, Marius Thériault, M. (2009) "Evolution of travel and daily activity patterns and ICTs: Some results from the Quebec City Panel Survey". Paper presented for the *Fourth Specialist Meeting of the Network ICTs: mobilizing persons, places and space*. Québec, Canada, 7-9 October 2009.
- c.6 Fu L., Saccomanno F. and **Miranda-Moreno L.F.**, (2008) "GradeX - GradeX: Decision Support Tool for Hot Spot Identification and Countermeasure Analysis of Highway-Railway Grade Crossings", *TRB 86th Annual Meeting Compendium of Papers CD-ROM*, Washington, D.C.
- c.7 **Miranda-Moreno L.F.** and Fu, L., "Probabilistic Methods for Ranking and Selecting High Risk Highway-railway Grade Crossings" *9th International Level Crossing Safety and Trespass Prevention Symposium*, Montréal, Québec, Canada, September 10-14, 2006.
- c.8 Fu L., Perchanok M.S. and **Miranda-Moreno, L.F.**, "Effects of Winter Weather and Maintenance Treatments on Highway Safety", *TRB 85th Annual Meeting Compendium of Papers CD-ROM*, Washington, D.C.
- c.9 **Miranda-Moreno L.F.**, Lord D. and Fu L. (2008), "Bayesian road safety analysis: incorporation of past experiences and effect of hyper-prior choice" *TRB 86th Annual Meeting Compendium of Papers CD-ROM*, Washington, D.C.

- c.10 Lee-Gosselin, M., Ramadier T., Eaux C., **Miranda-Moreno, L.F.** “Time-space interactions in Quebec City and Strasbourg: exploring the decision styles of travellers” *12th Conference of the International Association for Travel Behaviour Research*, 2009, Jaipur, India.
- c.11 Lee-Gosselin M., Rondier P. and **Miranda-Moreno L.F.** (2007) “The Evolution of Perceived Spatio-Temporal Flexibility in Activity Patterns”. Published in the paper compendium of the *11th International Conference on Travel Behaviour Research*, Kyoto, 16-20, August 2006.

### **Reports produced for government agencies**

- d-1 Barla P., Miranda-Moreno L., Savard-Duquet N. (2010) “*Mobilité et changements climatiques: bilan et analyse des déterminants des émissions de gaz à effet de serre associées aux déplacements des ménages de la ville de Québec*”, Report prepared for the Quebec Ministry of Transportation.
- d-2 CIMA team, Miranda-Moreno, et al. (2010) “*Evaluation de l’impact de la réduction des limites de vitesse à 40 km/h*”. Report prepared for the City of Montreal.
- d-3 Barla P., Miranda-Moreno L., Savard-Duquet N. (2009) “*Formes urbaines et mobilité que dit la recherche?*”, Report prepared for the Quebec Ministry of Transportation.
- d-4 CIMA team, **Miranda-Moreno**, et al. (2009) “*Document d’orientation bureau de la sécurité des déplacements*”, Report prepared for the City of Montreal.
- d-5 Boucher N. and **Miranda-Moreno L.F.** (2008), “*Perspectives of railway transportation in Canada*”. Report prepared for Natural Resources of Canada.
- d-6 Saccomanno F., Fu L. and **Miranda-Moreno L.** (2008), “*Decision Support Model for Prioritizing Safety Improvement Programs at High Risk Highway-Railway Grade Crossings*”. Report prepared for the Transportation Development Centre, Transport Canada.
- d-7 Saccomanno F., Fu L., Ren C. and **Miranda-Moreno L.F.** (2004), “*Identifying Highway-Railway Grade Crossing Black Spots: Phase One*”. Report prepared for the Transportation Development Centre, Transport Canada.

- d-8 Fu F., **Miranda-Moreno L.F.** and Shah Q.A. (2006), *“Impact of Winter Weather and Maintenance Treatments on Highway Safety and Mobility”*. Report prepared for the Ontario Ministry of Transportation (MTO).
- d-9 Bustos A., **Miranda-Moreno L.F.**, Acha J., Aguerrebere R. (2003), *“Analysis of Potential Markets for Intermodal Terminals in the International Trade Mexico-USA”*. Report published by the Mexican Transport Institute (Instituto Mexicano del Transporte, Publicación Técnica No. 235).

### STUDENT SUPERVISING

#### Former graduate students:

Name	Degree	Year of graduation	Home Department/ University	Title of Thesis Present	Current Position
A. Francisque:	PhD, in co-supervision with M. Rodriguez	2009	School of Regional and Urban Planning, Laval University	Strategies for improving the surveillance of drinking water quality in distribution networks: application of emergent modeling approaches	Post-doctoral position, UBC
Nikolas Savard-Duquet,	Masters, in co-supervision with P. Barla	2009	Department of economics, Laval University	Mobilité et changements climatiques : Bilan et analyse des émissions de gaz à effet de serre liées aux déplacements des résidents de la région de Québec	Fisheries and Oceans Canada
L. Bettex	Masters, in co-supervision with Michel Bierlaire	2010	Ecole de Génie Civil, Ecole Polytechnique Fédérale de Lausanne	Analyse des relations entre la forme urbaine, l'accessibilité aux transports en commun et la mobilité quotidienne des habitants de la ville de Québec, Canada	Citec, Genève, Switzerland
M. Bagheri	Post-doctoral fellow	Summer 2010	Department of Civil Engineering, McGill University	Contributing severity factors in train-car collisions at grade highway-railway crossings	Post-doctoral fellow, McGill

**Current graduate students:**

<b>Name</b>	<b>Degree</b>	<b>Years</b>	<b>Home Department/University</b>	<b>Title of Thesis Present</b>
<b><i>PhD students</i></b>				
Amir Zahabi	PhD, main supervisor	2009/2012	Department of Civil Engineering, McGill University	Novel methods for estimating CO2 emissions and evaluating transportation reduction strategies
Taimur Usman	PhD, in co supervision with L. Fu	2006/2010	Department of Civil Engineering, University of Waterloo	Models for quantifying safety benefits of winter road maintenance
Kevin Manaugh	PhD, in co-supervision with A. El-Geneidy	2010/2013	School of Urban Planning, McGill University	To be defined
<b><i>Masters students</i></b>				
Tyler Kreider	Masters (thesis)	Aug 2009 – Aug 2011	Department of Civil Engineering, McGill University	The link of built environment and travel outcomes
J. Strauss	Masters (thesis)	Jan 2010 – Dec 2011	Department of Civil Engineering, McGill University	Intersection designs and bicycle safety in urban Quebec
P. St-Aubin	Masters (thesis)	Jan 2010 – Dec 2011	Department of Civil Engineering, McGill University	Diver behavior and safety analysis for specialized freeway lane markings
David Fernandes	Masters (thesis)	Jan 2010 – Dec 2011	Department of Civil Engineering, McGill University	Pedestrian risk exposure modeling at signalized intersections
Sabrina Chang	Masters (thesis)	Aug 2010 – Aug 2012	Department of Civil Engineering, McGill University	To be defined
Wei Yi Kho	Masters (project)	Aug 2010 – Aug 2012	Department of Civil Engineering, McGill University	To be defined
Rui Jiang	Masters (project)	Aug 2010 – Aug 2012	Department of Civil Engineering, McGill University	To be defined