

THOMAS SMAHEL, M.ARCH, CCPE, RSP2B
President and Principal Consultant

Human Factors North Inc.
500 King Street West, Suite 300
Toronto, Ontario
M5V 1L9

Telephone: (416) 596-1252
E-mail: tsmahel@hfn.ca



Mr. Smahel is a Canadian Certified Professional Ergonomist and is certified as a Road Safety Professional (Level 2 - Behavioural). He has over 25 years of experience at Human Factors North Inc., where he is President and Principal Consultant. He holds an M.Arch. (2007) in Architecture, specializing in environmental impacts on human performance, and a B.A.Sc. in Industrial Engineering (1999), with a thesis specializing in human factors research in transportation. Mr. Smahel is a past board member of the Canadian College for the Certification of Professional Ergonomists (CCCPE) and is currently Past-Chair of the Transportation Association of Canada (TAC) Road Safety Committee (RSC). He has acted as a human factors expert witness in over 200 legal cases involving collisions between motor vehicles, trains, transit vehicles, pedestrians, and cyclists and has assisted in the human factors analysis in over 240 other legal cases.

PROFESSIONAL EXPERIENCE

March 2021 – present
President – Human Factors North Inc.

January 2011 – March 2021
Principal Consultant – Human Factors North Inc.

January 2007 – January 2011
Consultant – Human Factors North Inc.

May 1999 – January 2007
Research Associate – Human Factors North Inc.

DESIGNATIONS

Canadian Certified Professional Ergonomist (CCPE) – 2007
Road Safety Professional (Level B: Behavioural) (RSP2B) - 2023

EDUCATION

M.Arch – Master of Architecture (Environmental / Human-Centred Design) – 2007
University of Toronto

B.A.Sc. – Industrial Engineering (Human Factors Specialist) – 1999
University of Toronto
(Thesis title: “Attentional Demands of Driving: A Study in Driver Looking Behaviour”)

PROJECTS - ROAD SAFETY

407 ETR

- Conduct human factors assessment of driver distraction in vicinity of digital billboards

AECOM

- Design and carry out comprehension test to evaluate detour sign options for Highway 115 near Peterborough

Canada Post Corporation:

- Conduct literature review to determine ergonomic issues for mail delivery vehicles

CIMA:

- Provide human factors contribution to the development of guidelines for static electronic advertising signs for the Town of Oakville
- Conduct human factors assessment of the March Road at-grade crossing in Ottawa
- Provide human factors contribution to the Digital Billboard guidelines for MTO (location selection, placement criteria, and design)
- Prepare human factors guidelines for dynamic message sign messages
- Provide human factors contribution to the TAC Road Safety Course
- Provide human factors contribution to the York Region Traveler Safety Plan, including development and analyzing a road user survey addressing road safety issues
- Provide human factors contribution to the Signage, Traffic, and Wayfinding Plan for the Highland Creek Treatment Plant Security Study.

City of Ottawa:

- Conduct human factors review of the Fallowfield at-grade rail crossing

City of Toronto:

- Conduct on-road experiment to evaluate legibility of street name signs in downtown and suburban regions
- Conduct on-road experiment with eye-tracking equipment to measure amount of driver distraction due to commercial advertising

Delcan:

- Provide human factors, signage and wayfinding expertise for Hwy 407 Transitway Value Engineering Workshop
- Provide human factors analysis of the Highway 26 Realignment Preliminary Design, including three roundabouts

Dillon Consulting (for Ministry of Transportation - Ontario):

- Conduct laboratory study to examine comprehension of warning and construction symbols and signs for Books 6 & 7 of the *Ontario Traffic Manual*

Downtown Yonge Business Improvement Association:

- Provide human factors advice on Downtown Yonge Street Traffic Pole Branding & Holiday Decorations Project, to ensure conspicuity of traffic signals

Fondation MAIF (France):

- Conduct interviews with young drivers and their parents to determine capabilities of teenage drivers

Greater Toronto Airport Groundside Association:

- Conduct two laboratory studies to measure drivers' decision times and accuracy as they responded to simulated wayfinding tasks using road signs guiding them into and out of the airport
- Conduct literature review of speed reducing countermeasures to be implemented on roadways leading into the airport

Gresham, Smith & Partners (Nashville, Tennessee):

- Provide human factors contribution to ACRP Wayfinding and Signing Guidelines for airport terminals and landside operations
- Provide human factors analysis and wayfinding assessment for roadway, parking, curbside, and terminal signage at Denver International Airport
- Provide human factors analysis and wayfinding assessment for parking, curbside, and terminal signage at San Francisco International Airport

HDR (formerly iTRANS Consulting):

- Develop methodology and carry out visual night-time inspection of the conspicuity, visibility, and legibility of MTO guide signs on 11 freeway segments in southern Ontario
- Conduct series of human factors visibility tests to assess the visibility, conspicuity, and visual distinctness of new lighting concepts for winter snow maintenance vehicles
- Conduct operational performance review of the active transportation facility at Duckworth Street and Highway 400
- Provide human factors contribution to literature review regarding state of practice converting HOV lanes to HOT lanes (for MTO)
- Provide human factors expertise for Holt Rd Interchange (Clarington) Value Engineering Workshop
- Provide human factors expertise for Hwy 6 Value (Guelph) Value Engineering Workshop
- Provide human factors expertise for Detroit River International Crossing (Windsor) Value Engineering Workshop
- Provide human factors expertise for Hwy 17 (Sault Ste Marie) Value Engineering Workshop
- Conduct human factors literature and field research in support of the design and selection of Rural Community Mail box lay-bys (for Canada Post Corporation)
- Assist in the development of the Rural Mail Box Traffic Safety Assessment Tool (for Canada Post Corporation)
- Conduct literature review of human factors and permanent raised pavement markers (for U.S. NCHRP)
- Conduct review, including interviews with drivers and pedestrians, of pedestrian crosswalks with refuge islands
- Provide human factors expertise to report outline safety issues associated with converting High Occupancy Vehicle (HOV) lanes into High Occupancy Toll (HOT) lanes
- Conduct series of human factors visibility tests to assess the visibility, conspicuity, visual distinctness of new lighting concepts for winter snow maintenance vehicles
- Conduct nighttime visibility assessment to examine the visibility, legibility, and retroreflectivity of ground-mounted freeway signs
- Conduct human factors component of the operational performance review of the active transportation facility at Duckworth Street and Highway 400

- Provide human factors input into MTO assignment exploring 140 km/h design speed standards

Hydro One:

- Contribute to analysis of vehicle fleet crashes and provide countermeasure recommendations

IBI Group (for Ministry of Transportation – Ontario):

- Design and conduct on-road and laboratory experiments to determine reading time requirements and message comprehension for bilingual changeable message signs
- Conduct design charette, focus group with representative drivers, field examination, and two phases of comprehension testing for bilingual changeable message signs, including traffic and safety messages
- Contribute to human factors and traffic safety review of system sponsorship and advertising on changeable message signs

Insurance Bureau of Canada:

- Design and supervise on-road study to examine the effects of cell phones on novice drivers compared to experienced drivers

ITT Industries:

- Conduct on-road experiments to determine sight distance requirements for non-signalized skew and horizontal curve intersections in urban and rural settings

KPMG (for Ministry of Transportation - Ontario):

- Assist in the assessment of human factors issues in regard to commercial signing

Ministry of Transportation in Ontario:

- Conduct on-road experiment with eye-tracking equipment to assess safety of monitoring during G2 driver licence examinations
- Conduct safety assessment of an at-grade intersection on Highway 17 near Sudbury

MORR Transportation Consulting Ltd (for Transportation Association of Canada)

- Design and carry out experiment to assess the conspicuity and comprehension of non-standard crosswalk treatments

Morrison Hershfield:

- Conduct literature review and review of signing plan with respect to safety issues associated with the “Battleship Configuration” at highway work zones

MRI Global (Kansas City, Missouri):

- Conduct on-road assessments of high-risk locations of median collisions

National Research Council:

- Conduct literature review on expected safety impacts of introduction of Low Speed Vehicles on public roadways

New Brunswick Department of Tourism and Parks:

- Provide human factors expert opinion on highway sign design issues relating to the Scenic Drive program in New Brunswick

Parks Canada:

- Conduct on-road and laboratory testing with a representative group of drivers to provide an empirically sound basis for sign layouts and selection of retro-reflectivity of sign background for Guide Sign Manual

Parsons:

- Conduct comprehension testing for new bilingual Dynamic Message Sign templates

R.F. Binnie & Associates

- Conduct human factors assessment of bicyclist-related signing needs specific to bridge joints

Stantec (for Ministry of Transportation Ontario):

- Conduct human factors analysis of the Highway 401 corridor between London and Tilbury
- Conduct human factors analysis of the Highway 401 interchanges and underpasses between London and Tilbury

Totten Sims Hubicki (for Ministry of Transportation Ontario):

- Conduct literature review on traffic calming measures for freeway transition zones

Transportation Association of Canada:

- Conduct evaluation of current standards used for sign letter size and to establish guidelines for optimal sign letter size for text signs

Transportation Development Centre – Transport Canada:

- Co-ordinate data collection efforts of fatigue management program implementation at trucking companies in Montreal (with AlphaLogik, Inc.), Calgary (with SagaTech Electronics Inc.), and California (with Alertness Solutions). Analyze before and after corporate and driver measures to assess impacts on fatigue.
- Investigate, through literature review and laboratory, simulator and on-road testing, and provide recommendations to improve the conspicuity, alerting capabilities, and safety effectiveness of various highway-railway grade crossing elements
- Conduct literature review concerning the investigation of commercial motor vehicle driver cumulative fatigue recovery periods

Transport Canada:

- Contribute to the literature view of laboratory testing methods and results for Level 2 and Level 3 driver interfaces
- Assess the environmental, economic, safety and social benefits of roundabouts

URS Canada Inc (for Ministry of Transportation Ontario):

- Conduct human factors assessment of widening section of Hwy 401 between RR25 and the Credit River including a literature review on HOV lane design and lane restrictions of commercial vehicle operators
- Conduct human factors assessment of driveways located in close proximity to a new freeway interchange
- Conduct preliminary human factors assessment of GTA West freeway connection to the interchange of Highway 401 and 407ETR
- Conduct human factors assessment of widening section of Hwy 410 between Highway 401 and Queen Street, including a literature review on HOV lane design

WSP Canada Inc. (formerly MMM Group / McCormick Rankin Corp / Delphi)

- Conduct human factors assessment of the speed management at the Brighton Swing Bridge (for MTO)
- Conduct human factors assessment of the speed management at the new Highway 7 east terminus (for MTO)
- Conduct human factors component of road safety audit of Highway 407 East (for MTO)
- Contribute human factors expertise in the development of the TAC Geometric Design Guide for Canadian Roads
- Conduct human factors assessment of 263 Adelaide Street West parking access
- Conduct human factors assessment of driver distraction due to dynamic billboards at Pearson International Airport
- Conduct ergonomic assessment of bus operator workspace in the context of railway crossing hazards for OC Transpo
- Conduct human factors review of Ontario Bikeway Planning and Design Guidelines
- Provide human factors advice on signing for Confederation Bridge guide signage
- Provide human factors contribution for simulation study of roundabout at Hwy 406 and Regional Road 27 to determine the effectiveness of the positive guidance proposed by MTO
- Provide human factors advice on signing for Cobequid Pass toll signage
- Conduct speed profile analysis for freeway transition zones
- Conduct speed profile analysis for Hwy 403 safety review
- Conduct human factors review of proposed signing at St. Peter's Road intersection in Prince Edward Island
- Conduct human factors review of proposed signing at Brighton Swing Bridge
- Conduct human factors review of warning signs on highway adjacent to TC Energy power plant during periods of very low visibility
- Carry out a human factors analysis of the current guide signing on QEW in both directions from Guelph Line to North Shore Boulevard
- Conduct a human factors analysis of the current conditions at all the approaches on the Perimeter Trunk Highway 101 in Winnipeg, Manitoba
- Conduct an analysis of the relevant human factors issues present at the intersection of PTH 1 and PTH 5 as part of a multi-disciplinary In-Service-Road-Safety-Review (Manitoba)
- Provide human factors contribution to the development of at least three crash truck conspicuity options and develop evaluation criteria.
- Provide a series of three assessments of the speed management plan on New Highway 7 at Woodlawn Drive in Guelph
- Provide human factors contribution to the TAC Synthesis report: "Design and Operation of Lower Speed Collector and Arterial Roads"

PROJECTS – TRANSIT and RAIL TRANSPORTATION SAFETY

CSA Group:

- Prepare a white paper to outline the key challenges that exist in the Canadian public transit sector, and to identify opportunities for the development of standards based on human factors knowledge in three areas:
 - Work activities of public transit vehicle operators,
 - Customer experience while on public transit vehicles,
 - Customer experience while wayfinding within a public transit system

City of Brampton:

- Conduct cognitive demands analysis (CDA) for Bus Operator position

Daimler Buses North America:

- Conduct human factors review to address visual concerns from operators of the Orion VII Next Generation transit bus

Grand River Transit – Kitchener / Waterloo:

- Conduct on-road study to assess bus driver workload while making manual stop announcements

Hatch (for Metrolinx):

- Assess the effect of train bells on customer behaviour on UP Express platforms

OC Transpo:

- Assess the visual and physical ergonomics-related hazards in relation to the bus operators' workspace in the new Alexander Dennis E500 bus
- Conduct an ergonomic assessment of a new video monitor location on the Alexander Dennis E500 bus

Metrolinx:

- Conduct ergonomic evaluation of the driver's area of three bus designs used by Metrolinx in 2023: Alexander Dennis Double Decker, MCI D4500 Series Coach, and Alexander Dennis Enviro500EV Electric Double Decker.
- *Conduct ergonomic evaluation of 2025 version of MCI D45 CRT coach bus*

New Flyer Industries Canada:

- Conduct ergonomic evaluation for the 40 foot XCelsior Diesel Electric Bus (XDE40)

Parsons:

- Conduct pedestrian surveys and video analysis of pedestrian behaviour at railway crossings to evaluate the effectiveness of grade-crossing enhancements at improving pedestrian safety
- Conduct human factors assessment of features at railway grade crossings such as multi-train warning signs (for Metrolinx)
- Develop human factors system requirements specifications for the Broadway Subway Extension (for TransLink B.C.)

Proterra (U.S.)

- Conduct human factors assessment of electric bus for Toronto Transit Commission

Toronto Transit Commission (TTC):

- Assess visual concerns from operators of the Orion VII bus vehicle
- Assess visual concerns from an operator of a commercial van
- Create drawings for the re-design of the speed control display for the new Automatic Train Control for use by Yonge-University Subway operators
- Assess visual line of sight obstruction of Fare Media Validation Prototype (Orion V and Orion VII)
- Conduct visual and cognitive assessment of the operator control panel for the Bombardier prototype low-floor streetcar
- Assess visual obstruction due to the protective barrier for large operators in NOVA RTS buses
- Assess visual clarity of new collector booth design
- Conduct review of subway stations with elevated frequency and severity of slip, trip, and fall events
- Conduct ergonomic review of 11 Subway Work Car vehicles in order to identify factors that would affect the safe and effective operation of the Subway Work Car fleet
- Conduct ergonomic assessment of the upper portion of the protective barrier on TTC buses
- Conduct ergonomic assessment of view obstructions associated with bicycles placed in the front bike rack on the Nova LFS Artic bus
- Conduct ergonomic re-assessment of view obstructions associated with bicycles placed in the modified front bike rack on the Nova LFS Artic bus
- Conduct ergonomic assessment of one person train operation on subway vehicles
- Conduct line of sight assessment for Geismar Crane vehicle
- Conduct ergonomic assessment of alarms faced by Power Control Operators at Transit Control
- Conduct ergonomic assessment of inattention and distraction for subway Operators
- Conduct ergonomic review of the guard indicator light on T1 subway cars
- Conduct ergonomic review of lighting in main transit control room
- Conduct ergonomic review of handrails on new Bombardier low-floor streetcars
- Conduct ergonomic assessment of proposed Control Room at Wilson Yard
- Conduct ergonomic assessment of Bus Operator startle response at railway crossings
- Evaluate whether motion induced blindness in the subway tunnel may have contributed to a near miss event
- Carry out two visibility assessments at St. Patrick subway station in response to an incident at track level
- Conduct ergonomic assessment of potential concerns related to the monitoring of customer activity on Line 5 platforms
- Conduct human factors and ergonomics evaluation of light rail vehicle operation on Line 6

TransLink:

- Conduct human factors assessment of new train warning sign including comprehension testing with a representative sample of drivers
- Conduct human factors assessment of the design and placement of Station Entrance Emergency Information Panels at all 33 SkyTrain stations
- Conduct human factors assessment of the design and placement of two types of dynamic information displays on all platforms at all 33 SkyTrain stations

VIA Rail Canada:

- Prepare report summarizing analysis of subject incidents and validation of current findings as to causes and corrective path
- Prepare report summarizing analysis of VIA's self-reporting and incident investigation process – Identification of additional causes and remedial actions

WGD Consulting (for Edmonton Transit):

- Prepare work systems ergonomics report for the Capital Line South Extension Llew Lawrence Operations and Maintenance Facility Building

PROJECTS – OTHER

C-Can Power Systems:

- Carry out a design review of displays and controls for nine new rectifiers that will be installed at OPG Darlington

Centre for Leadership and Human Resource Management (CLF/HRM):

- Conduct literature review to determine health and safety and ergonomic issues associated with the use of video display terminals in correctional institute control rooms

ErgExperts (New York, New York) (for Canada Post):

- Design and conduct laboratory study to evaluate visual demands associated with multiple postal delivery methods

Hatch:

- Conduct an on-site evaluation on the effect of train bells on customer behaviour on UP Express platforms (for Metrolinx)

Keilhauer

- Conduct literature review of ergonomic features and international guidelines and standards for office chair design

Law Society of Ontario

- Perform a human factors and ergonomic evaluation of the LSO Great Library at Osgood Hall

MDA Space

- Provide human factors requirements for the GERS training facility and provide methods and acceptable targets for requirement verification
- Conduct Human-In-The-Loop evaluations to demonstrate the verification of HMI-related GERS system requirements

Office of the Worker Adviser:

- Participate in the re-design of an office workstation for a client with special needs including building prototype

Shore Tilbe Irwin & Partners:

- Provide human factors and wayfinding design input during the Pickering Nuclear Generating Station administration building cafeteria upgrade

Toronto Community Housing Corporation (TCHC):

- Conduct cognitive demands analyses for 27 job types

Tyne Engineering (for AECL):

- Carry out a human factors assessment of the new design for the Thermovolt and Transcope instruments
- Carry out a design review of the Portable Feedwater Sampling System and prepare a Human Factors Engineering Summary Report
- Contribute to Human Factors Program Plan for Light Water Detritiation Facility at Chalk River Laboratories

- Contribute to Human Factors Verification and Validation Plan for Light Water Detritiation Facility at Chalk River Laboratories
- Contribute to Human System Interface Design Guide for Light Water Detritiation Facility at Chalk River Laboratories
- Contribute to Maintenance, Inspection and Testing Design Guide for Light Water Detritiation Facility at Chalk River Laboratories
- Contribute to Human Factors Engineering Summary Report for Light Water Detritiation Facility at Chalk River Laboratories
- Prepare Human Factors Program Plan (HFEP) for Ontario Power Generation Portable Feedwater Sampling System

LEGAL CLIENTS

Qualified as an Expert Witness in the Ontario Superior Court of Justice.

- Karadimas v. Solmon
- Labanowicz v. Corporation of the Town of Fort Erie
- Hill et al v. Cranney
- Queen v. Bodajla

Provided human factors evidence in Depositions for cases in the States of Indiana and Illinois

Carried out over 200 human factors forensic analysis, including site investigations, and authored expert reports for:

- AMR Barristers and Solicitors LLP
- Agro Zaffiro LLP
- Aviva Trial Lawyers
- Beard Winter
- Bell Baker LLP
- Benson Percival Brown LLP
- Bergeron Clifford LLP
- Boghosian + Allen LLP
- CBM Lawyers
- City of Ottawa
- Conte and Associates
- De Rose Barristers and Solicitors LLP
- Dyer Brown LLP
- Erickson & Partners
- Fireman Steinmetz Daya
- Gluckstein Personal Injury Lawyers
- Grillo Barristers
- Haghani Law Office
- Harrison Pensa LLP
- Hughes Amys LLP
- Kelly Law Offices
- Lerner LLP
- Linden & Associates
- Lofranco Correiro
- Loopstra Nixon LLP
- Malach Fidler Sugar + Luxenberg LLP
- MartaWatson LLP
- McCormick, Haney & Brimblecombe LLP
- O'Brien, Jacklin, Wickett, Sulman
- Oatley Vigmond
- Paquette Travers & Deutschmann
- Pipella Law
- Preszler Injury Lawyers
- Quinn Thiele Mineault Grodzki
- Rachlin and Wolfson
- Shillingtons LLP
- Siskinds LLP
- Torokin Manes
- Toronto Transit Commission
- Zuber & Company

Contributed to the human factors forensic analysis, including site investigations, in over 200 expert reports authored or co-authored by Dr. Alison Smiley for:

- Agro Zaffiro
- Beard Winter
- Bennett Jones
- Boland Howe
- Borden Ladner Gervais
- Dyer Brown
- Evans Philp
- Martin & Hillyer
- McLeish Orlando
- Miller Thompson
- Mollison McCormack
- Moodie Mair & Walker
- Oatley Vigmond
- Quinlan Abrioux

- Fasken Martineau
- Harrison Pensa
- Lerner LLP
- Siskinds
- Toronto Transit Commission
- Wissensz Law

PROFESSIONAL MEMBERSHIPS

- Canadian College for the Certification of Professional Ergonomists
- Transportation Association of Canada
- Association of Canadian Ergonomists
- Association of Pedestrian and Bicycle Professionals

COMMITTEES

- Transportation Association of Canada (TAC) Road Safety Committee (Chair: 2023-2025; Co-Chair: 2021-2023; Secretary 2019-2021; member 2013-present)
- Canadian College for the Certification of Professional Ergonomists (CCCPE) (Disciplinary Committee: 2024; Board Member; 2015-2018)
- Toronto Centre for Active Transportation (Steering Committee member, Chair of Research sub-committee: 2011-2013)
- Transportation Research Board (TRB) Bicycle Transportation Committee (Friend: Review research papers, 2011-present)

CONFERENCE PAPERS and PUBLICATIONS (peer reviewed):

Smahel, T. ACRP Report 161: Guidelines for improving airport services for international customers. *Presented at the 2017 annual meeting of the AAAE/IAAE North America / Central Europe Airport Issues Conference, Budapest, Hungary.* October 2017.

Smahel, T. Airport features most likely to affect international traveler satisfaction. *Presented at the 2017 annual meeting of the Transportation Research Board, Washington D.C.* January 2017.

Smiley, A., Smahel, T., Pearsall, M., and Dow, T. Field test of visibility markers for snow maintenance equipment. *Presented at the 2017 annual meeting of the Transportation Research Board, Washington D.C.* January 2017.

Smiley, A. and Smahel. Traffic Control Devices. *Human Factors in Traffic Safety, 3rd Edition.* Alison Smiley, Ed. ISBN 13: 978-1-933264-88-2, Lawyers & Judges Publishing Company, Inc., Tucson, Arizona. 2016.

Smahel, T., Ng, H., and Chu, S. Human Factors Analysis of Real-Time Rail Crossing Information Sign. *Presented at the 101st annual meeting of the Transportation Association of Canada, Charlottetown, PEI.* September 2015.

Smiley, A., Smahel, T., and Erwin, S. Human factors evaluation of new pictogram-based messages for bilingual variable message signs. *Presented at the 100th annual meeting of the Transportation Association of Canada, Montreal Quebec.* September 2014.

Smahel, T. and Smiley, A. Human factors assessment of distraction, workload, and traffic safety in relation to bus operator workload during manual stop announcements. *Presented at the 100th annual meeting of the Transportation Association of Canada, Montreal Quebec.* September 2014.

McLeod, D., Rowland, T., Rudin-Brown, C., Smahel, T., and Rose, A. New Zealand drivers' perceptions of the costs and benefits of speeding: Comparisons to Canadian Data. *Presented at the 24th annual meeting of the Canadian Association of Road Safety Professionals.* June 2014.

Smiley, A. and Smahel, T. Effect of an advance warning sign on driver behaviour at a passive rail crossing. *Presented at the 91st annual meeting of the Transportation Research Board, Washington D. C.* January 2012.

Smahel, T. and Smiley, A. Evaluation of bilingual sign layout and information load prior to implementation of new signing system. *Transportation Research Record, 2248,* pp. 37-44. 2011.

Smiley, A., Smahel, T., Courage, C., Fitch, G., and Currie, M. Required letter height for street name signs: An on-road study. *ITE (Institute of Transportation Engineers) Journal,* Vol. 81, No. 7, 2011.

Smahel, T. *LEED and Ergonomics: Working together to create healthy and productive workplaces.* Presented at the Association of Canadian Ergonomists Conference. June 2010.

Smahel, T., and Smiley, A. Evaluation of roadway guide signs at Toronto Pearson International Airport. *Transportation Research Record, 2185.* pp. 63-70. 2010.

Smiley, A., Smahel, T., Boivin, D., Boudreau, P., Remmers, J., Turner, M., Rosekind, M. and Gregory, K.B. *Effects of a fatigue management program (FMP) on fatigue in the commercial motor vehicle industry.* Presented at the Apnea/Sleep Disorders sessions of the annual convention of the Ontario Trucking Association, Toronto, Ontario, November 19, 2009.

Smiley, A., Smahel, T., and Donderi, D.C. On-road and laboratory evaluation of bilingual variable message signs. *Advances in Transportation Studies: An International Journal, B (19),* pp. 85-96. 2009.

Smiley, A., Smahel, T., Boivin, D., Boudreau, P., Remmers, J., Turner, M., Rosekind, M. and Gregory, K.B. *Effects of a fatigue management program (FMP) on fatigue in the commercial motor vehicle industry.* Presented at the International Conference on Fatigue Management in Transportation Operations, Boston, Massachusetts, March 2009.

Robinson, J.R., Smiley, A., Smahel, T., and Chisolm, G. Design guidance for freeway transitions to signalized intersection: Some application heuristics. *Transportation Research Board 88th Annual Meeting Compendium of Papers DVD, Paper #09-2861.* 2009.

Smahel, T., Smiley, A., and Donderi, D. The effects of cellular phone use on novice and experienced driver performance: An On-Road study. *Presented at the 52nd Annual Meeting of the Human Factors and Ergonomics Society.* September 2008.

Smiley, A., Persaud, B., Bahar, G., Mollett, C., Lyon, C., Smahel, T., Kelman, L. Traffic safety evaluation of video advertising signs. *Presented at the 84th Annual Meeting of the Transportation Research Board, Washington, D.C.* January 2005.

Smiley, A., Smahel, T., and Eizenman, M. The impact of video advertising on driver fixation patterns. *Presented at the 83rd Annual Meeting of the Transportation Research Board*, Washington, D.C. January 2004.

Bahar, G., Mollett, C., Persaud, B., Lyon, C., Smiley, A., Smahel, T., and McGee, H. (2004). Safety evaluation of permanent raised pavement markers. *NCHRP Report 518*, Transportation Research Board, Washington, D.C. 2004.

Smiley, A., Courage, C., Smahel, T., Fitch, G. and Currie, M. Required letter height for street name signs: An on-road study. *Presented at the 80th Annual Meeting of the Transportation Research Board*, Washington, D.C. January 2001.

INVITED PRESENTATIONS AND COURSES

Ontario Provincial Police (full day): “Human Factors in Traffic Safety”. May 2013, May 2015. May 2016, May 2017.

University of Toronto, MIE 1414: Human Factors in Transportation: “Human Factors in Bicycle Crashes”. 2014-2024.

University of Toronto, MIE 345: Case Studies in Ergonomics: “Human Factors in Bicycle Crashes”. 2012-2016, 2018-2024.

Ryerson University, CV 8400: Road Safety: “Introduction to Human Factors”. 2014, 2017, 2024.

University of Toronto, MIE 345: Case Studies in Ergonomics: “The Effects of Cellular Phone Use on Novice and Experienced Driver Performance”. 2007 – 2010, 2012-2016.

University of Toronto, MIE 345: Case Studies in Ergonomics: “Slip and Fall Accidents”. 2008 - 2010, 2012-2014.

University of Toronto, MIE 345: Case Studies in Ergonomics: “Wayfinding Exercise at Robarts and Gerstein libraries”. 2007 - 2009.

University of Toronto Human Factors Interest Group: “Human Factors and Road Safety: Case Studies”. April 2009.

EPIC Municipal Infrastructure Training (full day): “Design Safer Roads for Pedestrians and Cyclists”. March 2014, February 2016, February 2017. February 2019.

Transportation Association of Canada (TAC) Workshop: How to conduct an in-service road safety review, “Introduction to Human Factors”. September 2014.

Association of Canadian Ergonomists (webinar at Annual Conference): “Ergonomics: LEEDing the Way”. August 2012.

Ontario Good Roads Associates: “Bicycle Crashes: What Can We Learn From Them”. October 2011.

Association of Canadian Ergonomists (Ontario Chapter): “LEED: Green Design, Green Ergonomics”. June 2010.

Greater Toronto Area Environmental, Health, Safety and Ergonomics Network: “From Sick Buildings to Healthy Workplaces”. May 2009.

International Facility Managers Association: “Ergonomics and Human Factors Aspects of Universal Design”. May 2009.

TECHNICAL REPORTS

Smith, S. and Smahel, T. *Ergonomic Evaluation of MCI D45 CRT Coach Bus*. Report prepared for Metrolinx. November 2025.

Smahel, T. and Smith, S. *Human Factors & Ergonomics Assessment of Vehicle Operation on Line 6*. Report prepared for TTC. September 2025.

Smahel, T. and Smith, S. *Metrolinx Grade-Crossing Enhancements – Pedestrian Comprehension Evaluation Report*. Report prepared for Parsons. September 2025.

Rudin-Brown, M. and Smahel, T. *Report on Activity 4.2: Analysis of VIA’s Self-Reporting and Incident Investigation Processes: Identification of Additional Causes and Remedial Actions*. Report Prepared for VIA Rail Canada. August 2025.

Rudin-Brown, M. and Smahel, T. *Report on Activity 6.1: Analysis Report of Incidents and Validation of Current Findings as to Causes and Corrective Path*. Report Prepared for VIA Rail Canada. May 2025.

Smith, S. and Smahel, T. *Work Systems Ergonomics Report (Interim) – Capital Line South Extension Llew Lawrence Operations and Maintenance Facility Building*. Report prepared for WGD Consulting. April 2025.

Smahel, T. and Smith, S. *Human Factors Review of Line 5 Platform Monitoring*. Report prepared for TTC. December 2024.

Smith, S. and Smahel, T. *Human Factors and Ergonomics Evaluation of the Law Society of Ontario (LSO) Great Library – Wayfinding Assessment*. Report prepared for LSO. November 2024.

Smith, S. and Smahel, T. *Human Factors and Ergonomics Evaluation of the Law Society of Ontario (LSO) Great Library – Staff Interviews and User Survey*. Report prepared for LSO. July 2024.

Smahel, T. *Operational Performance Review of Highway 10 – Human Factors Analysis*. Report prepared for HDR Corporation. July 2024.

Smahel, T. and Smith, S. *Human Factors Issues in Transit Industry*. Report prepared for CSA Group. September 2023.

Smith, S. and Smahel, T. *Ergonomic Evaluation of Buses*. Report prepared for Metrolinx. July 2023.

Rudin-Brown, M., Smahel, T., Smith, S. *Gateway External Robotics System (GERS) Human Factors Development: HITL Report #1*. Prepared for MDA Space. July 2023.

Smith, S. and Smahel, T. *Ergonomic Evaluation of the 40 FT XCelsior Diesel Electric (XDE40) Bus*. Report prepared for New Flyer Industries Canada. March 2023.

Smahel, T. and Smiley, A. *Signing Needs / Requirements Specific to Bridge Joint Sites*. Report prepared for R.F. Binnie & Associates. March 2023.

Smahel, T. and Smiley, A. *Comprehensive Motorcycle Safety Study*. Report prepared for City of Toronto Transportation Services. December 2022.

Montufar, J., Olfert, M., Gu, S., Baugh, N., Smiley, A., Smahel, T., Bahar, G. *Non-Standard Pavement Markings for Crosswalk*. Prepared for Transportation Association of Canada. August 2022.

Smahel, T. *Human Factors Analysis of Highway 401 Interchanges and Underpasses Between London and Tilbury*. Report prepared for Stantec. July 2022.

Rudin-Brown, M., Smahel, T., Smith, S. *Gateway External Robotics System (GERS) Phase B Preparation – Human Factors Requirements for GERS Training Facility*. Prepared for MDA Space. March 2022.

Smahel, T. and Smith, S. *Union-Pearson Express Bell Cessation Pilot – Impact of Train Bells on Customer Behaviour*. Report prepared for Hatch Engineering (for Metrolinx). December 2021.

Smahel, T. *Human Factors Assessment of Multi-Train Warning Signs*. Report prepared for Parsons (for Metrolinx). October 2021.

Smith, S. and Smahel, T. *Ergonomic Evaluation – TTC Electric Bus Comparison*. Report prepared for Toronto Transit Commission. March 2021.

Smith, S. and Smahel, T. *Ergonomic Evaluation of the BYD K9M Bus*. Report prepared for Toronto Transit Commission. February 2021.

Smith, S. and Smahel, T. *Ergonomic Evaluation of the New Flyer Xcelsior Bus*. Report prepared for Toronto Transit Commission. February 2021.

Smahel, T. *Ergonomic Review of Bus Operator Startle Response at Railway Crossings*. Report prepared for Toronto Transit Commission. November 2020.

Smahel, T. *Human Factors Analysis of Highway 401 Corridor Between London and Tilbury*. Report prepared for Stantec. October 2020.

Smith, S. and Smahel, T. *Ergonomic Evaluation of the Catalyst E2 Duopower Bus*. Report prepared for Proterra Inc. August 2020.

Smahel, T. and Smith S. *Human Factors / Ergonomics Review of the Wilson Yard Control Room Renovation*. Report prepared for Toronto Transit Commission. August 2020.

Smith, S. and Smahel, T. *Ergonomic Review: Low Floor Light Rail Vehicle Handrail and Handstrap Addition*. Report prepared for Toronto Transit Commission. December 2019.

Smiley, A. and Smahel, T. *Driver Distraction on 407ETR due to Digital Billboards*. Report prepared for 407ETR. August 2019.

Smahel, T. and Smiley, L. *Human Factors Guidelines for Dynamic Message Sign Messages*. Report prepared for CIMA+. August 2019.

Smith, S. and Smahel, T. *Ergonomic Assessment of the T1 Subway Car Reset Button Relocation*. Report prepared for Toronto Transit Commission. June 2019.

Smahel, T. and Smith S. *Human Factors / Ergonomics Review of the Transit Control Theater – fourth Row*. Report prepared for Toronto Transit Commission. March 2019.

Smahel, T. and Smiley, L. *User Comprehension Testing – Overhead Sign Options on Highway 115*. Report prepared for AECOM. February 2019.

Smahel, T. *Geismar Crane Line of Sight Assessment*. Report prepared for Toronto Transit Commission. June 2018.

Smahel, T. *Ergonomic Review of Power Control Alarms*. Report prepared for Toronto Transit Commission. June 2018.

Smahel, T. *Ergonomic Review of Subway Operator Distraction Prevention Strategies*. Report prepared for Toronto Transit Commission. November 2017.

Smahel, T. *Operational Performance Review – Active Transportation Facility – Duckworth Street and Highway 400*. Report prepared for HDR Corporation (for the Ministry of Transportation in Ontario). October 2017.

Smiley, A., Smahel, T., and Green, P. *Laboratory Testing of Level 2 and Level 3 Driver Interfaces: A Review of 19 Studies*. Report prepared for Transport Canada. August 2017.

Smahel, T. *MTO Guide Sign Reflectivity – Visual Night-time Inspection*. Report prepared for the Ministry of Transportation in Ontario. June 2017.

Smahel, T. *Ergonomic Assessment of New Location of Video Monitor on Alexander Dennis E500 Bus*. Report prepared for OC Transpo. May 2017.

Smahel, T. *Ergonomic Assessment of the Guard Indicator Light on T1 Subway Cars*. Report prepared for Toronto Transit Commission. March 2017.

Smahel, T. and Smiley, A. *Human Factors Assessment of 263 Adelaide Street West Parking Access*. Report prepared for WSP / MMM Group. January 2017.

Smahel, T. and Smiley, A. *Human Factors Assessment of Station Entrance Emergency Information Panels*. Report prepared for South Coast B.C. Transportation Authority (TransLink). October 2016.

Smahel, T. and Smith, S. *Human Factors / Ergonomics Review of One Person Train Operation (OPTO) on Line 4*. Report prepared for Toronto Transit Commission. May 2016.

Smahel, T., Kawaja, K., and Donderi, D. *Ergonomic Assessment of Low Headroom Areas on 8400 Series Nova Buses*. Report prepared for Toronto Transit Commission. February 2016.

Smahel, T. and Smiley, A. *Human Factors Assessment of Highway 33 between Collins Bay Road and Coverdale Drive*. Report prepared for Ainley Graham & Associates Ltd. November 2015.

Smahel, T. and Smith, S. *Ergonomic Review of the Placement of PRESTO equipment on Four Bus Models*. Report prepared for Toronto Transit Commission. November 2015.

Smahel, T. and Smith, S. *Ergonomic Review of the Placement of PRESTO equipment on Two Streetcar Models*. Report prepared for Toronto Transit Commission. October 2015.

Smiley, A. and Smahel, T. *Driver Distraction due to Dynamic Billboards*. Report Prepared for MMM Group Ltd. June 2015.

Smiley, A. and Smahel T. *Human Factors Review of the Fallowfield At-Grade Rail Crossing*. Report prepared for City of Ottawa. March 2015.

Smiley, A. and Smahel T. *Ergonomic Assessment of Bus Operator Workspace and Railway Crossing Hazards for OC Transpo*. Report prepared for MMM Group Ltd. January 2015.

Smahel, T. *Ergonomic re-assessment of line of sight on Nova LFS Artic buses with modified front bike rack*. Report prepared for Toronto Transit Commission. January 2015.

Smahel, T. *Ergonomic assessment of forward view on Nova LFS Artic buses with bicycles in front bike rack*. Report prepared for Toronto Transit Commission. September 2014.

Smiley, A. and Smahel, T. *Snow Plow Perception of Closing Velocity and Conspicuity Assessment*. Report prepared for Ontario Ministry of Transportation. March 2014.

Smahel, T. and Smith, S. *Human Factors / Ergonomics Review of TTC Subway Work Cars*. Report prepared for Toronto Transit Commission. March 2014.

Smahel, T. *Ergonomic Assessment of the Upper Portion of the Protective Barrier on TTC Buses*. Report prepared for Toronto Transit Commission. February 2014.

Smiley, A. and Smahel, T. *Snow Plow Equipment Visibility Verification Study*. Report prepared for Ontario Ministry of Transportation. January 2014

Smahel, T. *Ergonomic Review of Slip, Trips, and Falls on Subway Station Stairs*. Report prepared for Toronto Transit Commission. January 2014.

Smiley, A. and Smahel, T. *Snow Plow Checkerboard Selection Test*. Report prepared for Ontario Ministry of Transportation. December 2013

Smahel, T. *Ergonomic Assessment of Collector Booth Glass Clarity – Davisville Station*. Report prepared for Toronto Transit Commission. December 2013.

Smahel, T., Smith, S., Donderi, D.C., and Kawaja, K. *Human Factors Engineering Summary Report – Ontario Power Generation Portable Feedwater Sampling System*. Report prepared for Tyne Engineering. July 2013.

Smahel, T., Smith, S., Donderi, D.C., and Kawaja, K. *Human Factors Engineering Program Plan (HFEP) – Ontario Power Generation Portable Feedwater Sampling System*. Report

prepared for Tyne Engineering. June 2013.

Smahel, T and Smiley, A. *Human Factors Analysis – TransLink Rail Crossing Information System (RCIS) Motorist Advisory Signs*. Report prepared for South Coast B.C. Transportation Authority (TransLink). April 2013.

Smahel, T and Smiley, A. *Human Factors Assessment – Highway 410 from Highway 401 to Queen Street*. Report prepared for URS Canada Inc. November 2012.

Smahel, T *Ergonomic Assessment of Collector Booth Glass Clarity*. Final Report prepared for Toronto Transit Commission. August 2012.

Smiley, A. and Smahel, T. *MTO Bilingual Variable Message Signs: Phase 2 Results*. Final Report prepared for IBI Group. July 2012.

Donderi, D.C., Smith, S., Kawaja, K., Smahel, T. and Lallani, R. *Human Factors Engineering Summary Report for the Light Water Detritiation Facility (LWDF)*. Report prepared for Tyne Engineering. April 2012.

Donderi, D.C., Smith, S., Kawaja, K., Smahel, T. and Lallani, R. *Design Guide: Maintenance, Inspection, and Testing for the Light Water Detritiation Facility (LWDF)*. Report prepared for Tyne Engineering. February 2012.

Donderi, D.C., Smith, S., Kawaja, K., Smahel, T. and Lallani, R. *Design Guide: Human System Interface for the Light Water Detritiation Facility (LWDF)*. Report prepared for Tyne Engineering. February 2012.

Smiley, A. and Smahel, T. *Human Factors Assessment – Highway 401 from Regional Road 25 to Trafalgar Road*. Report prepared for URS Canada Inc. January 2012.

Donderi, D.C., Smith, S., Kawaja, K., Smahel, T. and Lallani, R. *Human Factors Engineering Program Plan (HFEPP): AECL Chalk River Laboratories Light Water Detritiation Facility, Building 215*. Report prepared for Tyne Engineering. November 2011.

Donderi, D.C., Smith, S., Kawaja, K., Smahel, T. and Lallani, R. *Human Factors Engineering Verification and Validation Plan (HFEVV): AECL Chalk River Laboratories Light Water Detritiation Facility, Building 215*. Report prepared for Tyne Engineering. August 2011.

Smahel, T. *Ergonomic assessment of trip and fall accidents on main stairwells at 2800 Speakman Drive*. Report prepared for Hatch Engineering. September 2011.

Smiley, A. and Smahel, T. *MTO Bilingual Variable Message Signs: Results – Phase 1*. Report prepared for IBI Group. August 2011.

Smahel, T., Smiley, A. and Mitchell, D. *Visual behaviour comparison between two methods of mail delivery*. Report prepared for Canada Post Corporation. November 2010.

Smiley, A. and Smahel, T. *Human Factors Assessment of Highway 406 Southbound Transition*. Final Report prepared for IBI Group. November 2010.

Smith, S. and Smahel, T. *Physical and Visual Ergonomic Evaluation of the Orion VII Next Generation Bus*. Final Report prepared for Daimler Buses North America. November 2010.

Smiley, A, Smahel, T, Trick, L. and Toxopeus, R. *Final Report on Highway 406 Simulation*. Final Report prepared for Delphi-McCormack Rankin. November 2010.

Smahel, T. and Smiley, A. *Assessment of Traffic Safety in Relation to Making Manual Stop Announcements*. Final Report prepared for Grand River Transit. July 2010.

Smahel, T. and Smiley, A. *Pedestrian Signs Photo Summary: Comments and Recommendations for Denver International Airport*. Final Report prepared for Gresham Smith and Partners. June 2010.

Smahel, T. and Smiley, A. *Frequently Asked Question Survey Results for Denver International Airport*. Final Report prepared for Gresham Smith and Partners. June 2010.

Smiley, A and Smahel, T. *Roadway Signs Photo Summary: Comments and Recommendations for Denver International Airport*. Final Report prepared for Gresham Smith and Partners. June 2010.

Smahel, T. and Smith, S. *Ergonomic / Human Factors Review of the Bombardier Streetcar Prototype*. Final Report prepared for Toronto Transit Commission. May 2010.

Smiley, A., Smahel, T. and Page, L. *Analysis of MVA Incident Database for Hydro One Networks inc.* Report prepared for Hydro One Networks Inc. December 2009.

Smahel, T. and Smith, S. *Ergonomic / Human Factors Review of the Fare Media Validation Prototype*. Final Report prepared for Toronto Transit Commission. November 2009.

Smiley, A., Smahel, T., Boivin, D., Boudreau, P., Remmers, J., Turner, M., Rosekind, M., and Gregory, K. *Effects of a Fatigue Management Program on Fatigue in the Commercial Motor Carrier Industry*. Final Report prepared for the Transportation Development Centre of Transport Canada. June 2009.

Bahar, G., Smahel, T. and Smiley, A. *Study of the Environmental, Economic, Safety and Social Benefits of Roundabouts*. Final report prepared for Director General Surface Policy, Transport Canada. March 2009.

Smiley, A., Smahel, T., and Page, L. *Older drivers and highway design*. Report prepared for the Canadian Automobile Association, Ottawa, Ontario. December 2008.

Smiley, A. Smahel, T. and Bahar, G. *Low speed electrical vehicles: Human factors and road safety impacts*. Report prepared for National Research Council, Ottawa. October 2008.

Smiley, A. and Smahel, T. *Human factors assessment of an entrance at Station 19+765 RT in the vicinity of the Gladu Road interchange*. Final report prepared for URS Canada Inc. September 2008.

Smiley, A. and Smahel, T. *Human factors assessment of an entrance at Station 19+900 RT in the vicinity of the Gladu Road interchange*. Final report prepared for URS Canada Inc. September 2008.

Smiley, A. and Smahel, T. *Human Factors expert opinion on highway sign design issues relating to the Scenic Drive program in New Brunswick*. Final report prepared for New Brunswick Department of Tourism & Parks. June 2008.

Smahel, T. *Assessment of Visual Concerns for Fire Prevention Van*. Final report prepared for Toronto Transit Commission. May 2008.

Smiley, A., Kline, D., Caird, J., Smahel, T., Shorten, J., and Jung, S. *Visual Behaviour and Conspicuity / Effectiveness of Grade Crossing Elements*. Final report prepared for Transportation Development Centre of Transport Canada. March 2008.

Smith, S., Smahel, T., and Kawaja, K. *Review of the Physical and Visual Ergonomic Concerns for the Orion VII Bus*. Final report prepared for the Toronto Transit Commission. December 2007.

Smahel, T and Smiley, A. *Driver comprehension of advance sign messages*. Final report prepared for Transportation Development Centre of Transport Canada. November 2007.

Donderi, D. and Smahel, T. *The Yonge-University subway ATC speed control display should look just like the AWS speed control display until routine AWS operation is ended*. Final report prepared for Toronto Transit Commission. November 2007.

Bahar, G., Smiley, A., Cotton, R., Howes, D., Tanaka, K., Ngau, G., Dustin, K. and Smahel, T. *Rural Community Mail Boxes – Lay-by site selection and design*. Final Report prepared for Canada Post Corporation. November 2007.

Kawaja, K and Smahel, T. *Human factors and ergonomic design input for Pickering NGS administration building cafeteria upgrade*. Prepared for Shore Tilbe Irwin & Partners. May 2006.

Smiley, A., Smahel, T., and Donderi, D. *The effects of cellular phone use on novice and experienced driver performance: Part 2 – On-road study*. Final report prepared for The Insurance Bureau of Canada. August 2006.

Smiley, A and Smahel, T. *Laboratory testing of layout alternatives prior to implementation of new signing system*. Final report prepared for Parks Canada. July 2005.

Smiley, A., Donderi, D., and Smahel, T. *Bilingual alternatives for VMS, PVMS and static signs*. Final report prepared for IBI Group (for the Ministry of Transportation, Ontario). May 2005.

Donderi, D, Kawaja, K, Patten, D, Smahel, T. *Expert advice on computer display screens*. Final report prepared for Centre for Leadership and Human Resource Management. February 2005.

Smiley, A. and Smahel, T. *MUTCD warning and regulatory letter heights in relation to the proposed standard*. Final report prepared for Transportation Association of Canada. September 2004.

Smiley, A., Smahel, T., and MacGregor, C. *An evaluation of parents' understanding of the capabilities of teenage drivers*. Final report prepared for Fondation MAIF, Paris, France. October 2004.

Smahel, T and Smiley, A. *On-road test of Parks Canada guide and street name signs*. Final report prepared for Parks Canada. March 2004.

Smiley, A., Donderi, D., Davis, D. and Smahel, T. *Assessment of safety of monitoring during G2 driver licence test*. Report prepared for Ministry of Transportation Ontario. June 2003.

Smiley, A. and Smahel, T. *Phase II: Wayfinding study for Pearson International Airport*. Final report prepared for the Greater Toronto Airport Groundside Association. February 2003.

Smiley, A. and Smahel, T. *Sight distance requirements for non-signalized skew and horizontal curve intersections*. Final report prepared for ITT Industries, Systems Division, Colorado Springs, Colorado. February 2002.

Smiley, A. and Smahel, T. *Freeway to highway transitions and speed-reducing countermeasures on the Highway 417 to 7 transition*. Report prepared for Totten Sims Hubicki Associates (for the Ministry of Transportation in Ontario). September 2001.

Smiley, A. and Smahel, T. *Wayfinding study for Pearson International Airport*. Final report prepared for the Greater Toronto Airport Groundside Association. June 2001.

Smiley, A., Smahel, T. and Bahar, G. *Human factors operational review: Intersection of Highway 17 and Regional Road 55*. Prepared for the Ministry of Transportation in Ontario, Sudbury District. April 2000.

Smiley, A. and Smahel, T. *Driver comprehension of warning and temporary conditions signs to be included in Books 6 and 7 of the Ontario Traffic Manual*. Presented to the Ministry of Transportation in Ontario. October 1999.

Smiley, A., Courage, C., Smahel, T., and Fitch, G. *Driver response to Toronto street name signs: An on-road study*. Final report for Toronto Transportation. August, 1999.

11/2025