



Pedram Izadpanah

Ph.D., P.Eng.



Expert Summary

Dr. Pedram Izadpanah has more than 18 years of academic and consulting experience in different areas of Transportation Engineering. Dr. Izadpanah's strengths include data mining, statistical modelling, and prediction models. His expertise involves development of new methodologies to collect, process, and analyze transportation data to improve decision making process for clients. He is a Professional Engineer in the Province of Ontario.

Specialized Professional Competencies

- Statistical modelling and analysis in transportation engineering
- Network Screening and Safety Performance Function (SPF) Development
- In-service road safety reviews
- Road Safety Audit
- Vision Zero and road safety strategic plans

Professional Experience

- True North Safety Group: 2022 - present
- TES Information Technology: 2018 - 2021
- CIMA+: 2009 - 2018
- Transportation Systems Research Group: 2005 - 2009
- Synectics Inc.: 2007 – 2008
- Rah Andishan Consulting Engineers: 2004 - 2005

Academic Background

- Ph.D., Civil Engineering, Transportation Engineering, University of Waterloo, 2010
- M.Sc., Civil Engineering, Transportation Planning, Sharif University of Technology, 2004
- B.Sc., Civil Engineering, Sharif University of Technology, 1999

Project Experience

Road Safety Strategic Plan (RSSP) – Niagara Region (Ongoing)

Developed a road safety strategic plan using the safe system principles to achieve the long term goal of Vision Zero. Conducted significant stakeholder and public consultation. Developed a 5-year action plan.

Road Safety Management and Plan – City of Niagara Falls (Ongoing)

Produced AADT for intersections and road sections. Developed Safety Performance Functions (SPFs) for intersections and road sections. Conducted network screening to identify locations with a potential for safety

improvement. Developed an annual collision report to identify patterns and trends. Developed emphasis areas for Vision Zero plan.

Operation Performance Review (OPR) Guide Update – Ministry of Transportation Ontario – Head Office (2022)

Updated the MTO OPR Guide to include updated and more case studies (e.g. roundabouts). Updated the content of the guide to include new technologies such as video conflict analysis. Updated the content of the guide to retire Safety Analyst and replace it with TES.

Deployment of the TES Application for the City of Vaughan – City of Vaughan (2022)

Identified the needs of the City for a transportation data management system. Compiled all infrastructure attributes. Processed 5 years of historical collision data. Processed historical TMC and ATR data. Conducted network screening to identify locations with safety issues. Provided training to staff.

Development of a Prioritization Methodology for Video Conflict Data – York Region (2022)

Developed a statistical model to identify intersections that have higher than expected number of conflicts at signalized intersections. Developed models for various types of conflicts and severity.

Review of the Intersection of Aberdeen Avenue and Governor Crescent – City of Vaughan (2022)

Conducted a site visit. Reviewed historical collision. Ran warrants for traffic signal. Reviewed the intersection for AODA compliance, sightlines, and visibility. Developed two alternatives to address AODA issues and illegal parking issues.

HWY 115 Safety Analysis – Ministry of Transportation Ontario – Eastern Region (2022)

Conducted a safety review along a stretch of Highway 115 from Lansdowne Street to Highway 35. Reviewed collision frequencies and severities on mainline and interchange mainline sections before and after the

implementation of 4 different pavement types. Conducted the analysis for different road surface conditions.

In-Service Road Safety Review – Niagara Region (2023)

Conducted in-service road safety review for the intersection of Welland Ave and Lake Street in the City of St. Catharines. Conducted collision analysis, reviewed network screening results, conducted site visits during day and night times, and measured lighting conditions. Developed countermeasures to address safety issues. Conducted benefit-cost analysis.

In-Service Road Safety Review for 15 Intersections – City of Hamilton (2022)

Conducted in-service road safety review with focus on pedestrian and cyclists for 15 intersections along Main Street and King Street corridors. Conducted collision analysis, reviewed network screening results, conducted site visits during day and night times, and measured lighting conditions.

In-Service Road Safety Review for 4 corridors – City of Hamilton (2022)

Conducted in-service road safety review with focus on pedestrian, cyclists, and access management for the 4 corridors of Upper Gage, Upper James, Queenston, and Barton. Conducted collision analysis, reviewed network screening results, conducted site visits during day and night times, and measured lighting conditions.

In-Service Road Safety Review – City of Hamilton (2022)

Conducted in-service road safety review along Ridge Road including the intersections. Focused on road side safety devices along the escarpment.

Network Wide AADT Production – City of Richmond Hill (2023)

Estimated historical AADT for counted intersections and road sections. Utilized the counted locations to develop AADT for non-counted locations. Developed a network-wide AADT map.

Annual Collision Report – Niagara Region (2022)

Conducted a detailed collision analysis for 2017-2021 to identify patterns and trends in the collisions for all road users. Developed graphics and drafted text. Developed a visually appealing report for elected officials and the public.

Annual Collision Report – City of Hamilton (2022)

Conducted a detailed collision analysis for 2017-2021 to identify patterns and trends in the collisions for all road users. Developed graphics and drafted text. Developed a visually appealing report for elected officials and the public.

Annual Collision Report – City of Brantford (2022)

Conducted a detailed collision analysis for 2017-2021 to identify patterns and trends in the collisions for all road users. Developed graphics and drafted text. Developed a visually appealing report for elected officials and the public.

Annual Collision Report – Niagara Region (2020)

Conducted a detailed collision analysis for 2015-2019 to identify patterns and trends in the collisions for all road users. Developed graphics and drafted text. Developed a visually appealing report for elected officials and the public.

School Crossing Guard Warrant, Exposure Index – City of Vaughan (2022)

Developed a methodology for the study to consider exposure index and risk factors. Collected traffic counts at intersections with various traffic control for the spring and fall of 2022. Developed a plan for new locations and for the future monitoring.

Riley Communities Mobility Study & Improvements Plan - City of Calgary (2022)

Retained as part of the Urban Systems project team to conduct a planning-level safety review of the intersections and roadways within Calgary's Riley Community, supporting Calgary's Safer Mobility Plan.

Development of Safety Performance Functions (SPFs) and Network Screening - City of Cambridge (2022)

Updated the road network model. Estimated AADTs for intersections and road sections for counted locations. Predicted AADTs for non-counted intersections and road sections. Developed SPFs for various site types for collision severity levels and initial impact types. Conducted network screening for intersections and road sections. Documented the results.

TES Application Enhancement, York Region (Ongoing)

Conducted road network update. Developed methodologies for predictive traffic signal warrants, systemic network screening, site selection for automated speed enforcement, and site selection for traffic calming locations.

Web-Based and Mobile Application for Sign Inventory Data Collection and Maintenance, Seminole County, Florida, 2021

Managed the day-to-day activities of the project. Identified the needs of the County through a virtual workshop. Developed a web and GIS based application to inventory all traffic signs. Developed capability to track all maintenance activities on traffic signs. Developed capability to track the cost associated with environmental events. Developed a mobile application for sign inventory and tracking maintenance activities for iOS and Android devices.

Transportation Operations and Safety Study, Halton Region (2020)

Compiled collisions and traffic volume data. Produced AADTs. Conducted network screening. Conducted benefit-cost analysis of countermeasures. Developed a white paper for conducting in-service road safety reviews and road safety audits. Developed a policy paper on the Region's road safety programs.

Evaluation of the City of London Road Safety Strategy, City of London, 2020 and 2021

Prepared collision data for the time before the implementation of the road safety strategy and after the road safety strategy. Performed a before and after analysis to determine the effect of the countermeasures implemented.

Development of Annual Safety Report, County of Essex (2021)

Reviewed the 2015-2019 collision data. Identified patterns and trends. Suggested countermeasures and further studies to address.

Development of Safety Performance Functions (SPFs) and Network Screening, City of Hamilton (2021)

Updated the road network model. Estimated AADTs for intersections and road sections for counted locations. Predicted AADTs for non-counted intersections and road sections. Developed SPFs for various site types (including ramps and parkway sections in the City of Hamilton) for collision severity levels and initial impact types. Conducted network screening for intersections and road sections. Documented the results.

Development of Safety Performance Functions (SPFs) and Network Screening for Intersections and Rural Roads, City of Ottawa (2021)

Updated the road network model. Estimated AADTs for intersections and road sections for counted locations. Predicted AADTs for non-counted intersections and road sections. Developed SPFs for various site types (including intersections and rural road sections) for collision severity levels and initial impact types. Conducted network screening for intersections and rural road sections using the sliding window with empirical Bayes method. Documented the results.

Road Safety Audit, Peel Region (2019)

Conduct collision analysis for the safety review of twenty-five locations in Peel Region. Developed CMFs for proposed countermeasures. Conducted benefit-cost analysis to identify viable countermeasure.

Deployment of the TES Safety Module for MTO, Ministry of Transportation Ontario (Ongoing)

Incorporated MTO collisions into TES. Customized the TES Safety Module to replace Safety Analyst for network screening, countermeasure selection, benefit-cost analysis, and project prioritization as part of the MTO APIL process.

Development and Implementation of Road Crash Database System in Kenya, Kenya National Highways Authority (Ongoing)

Updated Kenya's national crash report form. Implemented TES for Kenya including GIS and infrastructure inventory. Developed a mobile app for iOS and Android for crash reporting for the police. Customized reports.

TES Application Upgrade and Implementation, Ministry of Transportation Ontario (2022)

Updated the GIS and infrastructure inventory in TES for MTO. TVIS-LHRS reconciliation. Implemented volume production methodologies for MTO in TES including PDCS, PCS, and non-counted stations. Customized reports for MTO volume reporting. Implemented curve matching for PSC stations.

Manual for Uniform Traffic Control Devices for Canada, Sixth Edition, Transportation Association of Canada (TAC), 2018

Lead for the update of safety effects of traffic control devices. Co-lead of the temporary conditions section.

Transportation Risk Assessment, Nuclear Waste Management Organization (NWMO), 2018

Developed methodology for estimation of risk of nuclear materials via road and rail. Collected collision and traffic volume data from Ministry of Transportation Ontario. Estimated probability of collision on MTO highway network and railway network. Estimated risk of nuclear material transportation via road and rail. Reviewed deliverables. Managed budget and liaison with subconsultants.

2016 Travel Time Survey, Ministry of Transportation Ontario – Central Region, 2018

Reviewed project deliverables. Develop methodologies for GPS data collection and purchased data from TomTom.

Safety Assessment of 60 At-Grade Railway Crossings, City of London, 2018

Managed the project on time and on budget. Reviewed project deliverables. Prepared the

data for sharing of information to satisfy municipal requirements. Developed a field data collection checklist considering the new Transport Canada's grade crossing standards. Supervised site visits. Assessed the compliance of at-grade crossings with the applicable standards and regulations. Recommended improvements to the deficient railway crossings. Developed a plan for London to ensure that all crossings are reviewed based on the new proposed Transport Canada's regulations.

Traffic Volume Information System (TVIS2), Ministry of Transportation Ontario – Head Office 2015

Developed algorithms for annual production of Annual Average Daily Traffic (AADT). Documented the algorithms in a methodical approach for MTO programmers to implement the algorithms for TVIS2. Assisted the development team to implement and code the algorithms.

Update the Safety Analyst Software based on 2009 and 2010 Data, Ministry of Transportation, Head Office, 2014

Updated the Safety Analyst software using the 2009 and 2010 collision and traffic volume data. Re-calibrated the Ministry's Safety Performance Functions.

Highway Element Investment Review (HEIR) – Survey of Use and Transition to SafetyAnalyst, Ministry of Transportation Ontario, 2012

Oversaw development of a questionnaire for MTO staff to identify how and when they use the HEIR guidelines and spreadsheets. Supervised engineers to compare the HEIR and SafetyAnalyst and reviewed the final report and deliverables.

Configuration of SafetyAnalyst Software for Efficient and Effective Safety Management of MTO's Road Network, Ministry of Transportation Ontario, Head Office, 2013

Managed day-to-day activities of the project, Compiled infrastructure, collision, and volume data from all MTO Regions, and developed codes to convert the infrastructure, collision, and volume data from the existing databases to a format that complies with SafetyAnalyst.

Development of Safety Performance Functions and Network Screening, City of London (2020)

Conducted data analysis. Developed SPFs and conducted network screening for intersections and midblocks. Identified candidate sites for in-service road safety review.

Development of Annual Safety Report, City of Hamilton (2020)

Reviewed the 2015-2019 collision data. Identified patterns and trends. Suggested countermeasures and further studies to address the trends identified in the collision data.

Development of a Traffic Sign Inventory for the City of Ottawa, City of Ottawa (2020)

Day-to-day management of the project. Worked with the team to adjust and fine tune the accuracy of the road feature detection algorithm.

Sign Inventory Pilot, City of Ottawa (2019)

Developed a methodology for sign detection using videos obtained from commercial cameras equipped with GPS. Oversaw the implementation of the technology.

2018 Travel Time Studies, Halton Region (2019)

Developed project methodology. Reviewed the results and deliverables.

Development of SPFs and Site Selection for Red Light Cameras, City of Guelph (2019)

Conducted data analysis. Developed SPFs and conducted network screening for signalized intersections. Identified candidate sites for red light cameras using several factors including pedestrian collisions.

Development of SPFs and Site Selection for Red Light Cameras, City of Ottawa (2019)

Conducted data analysis. Developed SPFs and conducted network screening for signalized intersections. Identified candidate sites for red light cameras using several factors including pedestrian collisions.

Collision Analysis and Safety Review of Red Hill Valley Parkway (RHVP) and Lincoln Alexandre parkway, City of Hamilton (2018)

Reviewed collision data occurred on ramps of the RHVP and the LINC. Identified patterns in collisions and potential contributing factors. Developed potential countermeasures to improve safety on the study area ramps.

Guidelines for Defining and Measuring Urban Congestion, Transportation Association of Canada, 2018

Managed the project on time and on budget. Reviewed project deliverables. Worked directly with the Project Steering Committee. Presented at TAC Spring and Fall meetings. Developed a detailed Table of Content for the guide. Provided technical oversight and input into the development of all seven chapters.

Development and Recalibration of SPFs and Network Screening, Peel Region, 2018

Reviewed the infrastructure inventory, traffic volume, and collision data. Developed SPFs for intersections and midblocks. Conducted network screening. Provided training for Regional staff.

VivaNext BRT Hwy 7 - Road Safety Audits, York Region, 2017

Completion of comprehensive road safety audits through 30/60/90 & Final design stages as well as construction RSAs. Work undertaken for project consortium, EDCO.

Strategic Road Safety Plan, City of Kingston (2018)

Conducted literature review of best practices in vision zero. Analyzed collision data to identify emphasis areas. Conducted public opinion surveys. Held three workshops with stakeholders.

Transportation Safety Strategic and Operational Plan (TSSOP), Peel Region, 2018

Developed a coalition building and communication plan with stakeholders. Conducted a comprehensive literature review of road safety strategic plans, vision zero, and Region's safety programs. Presented in workshops with stakeholders.

Conducted a comprehensive collision analysis for identification of emphasis areas. Conducted a public opinion survey to assist in the identification of emphasis areas.

Road Safety Strategic Plan, City of Toronto, 2016

Conducted data analysis and survey of 1000 residents of the City of Toronto to identify emphasis areas. Set vision and goals for the strategic plan. Developed an extensive list of countermeasures. Held two stakeholder meetings. Developed the road safety strategic plan.

Safety Performance Function Development Update, Halton Region, 2017

Reviewed and signed off of project deliverables. Compiled the infrastructure, traffic volume, and collision data for SPF development.

In-Service Road Safety Review of Fermor Avenue Bridge, City of Winnipeg, 2016

Managed the project on time and on budget. Reviewed draft and final reports. Supervised field visit and data collection. Identified safety and operational issues for the existing conditions. Recommended countermeasures and improvements for inclusion in the design of the new bridge and the study area with focus on pedestrian and transit.

Development of Safety Performance Functions, Region of Waterloo, 2016

Managed the project on time and on budget. Quality control of all deliverables. Prepared infrastructure, traffic volume, and collision data. Developed Safety Performance Functions for intersections and road sections.

Development of Safety Performance Functions and Network Screening and In-Service Road Safety Review, Niagara Region, 2016

Managed the project on time and on budget. Presented the results at the Region Council Meeting. Quality control of all deliverables. Prepared infrastructure, traffic volume, and collision data. Developed Safety Performance Functions for intersections and road sections. Conducted network screening using

the Empirical Bayes method. Worked with the Region to identify twenty locations for in-service road safety reviews. Identified deficiencies and recommended countermeasure to improve safety at these locations.

Road Safety Review of Lincoln M. Alexander Parkway, City of Hamilton, 2015

Conducted collision analysis. Conducted field review. Developed countermeasures including installation of median guiderail systems, queue end warning systems, and rumble strips to address congestion related collisions and cross median collisions. Conducted benefit-cost analysis.

Risk and Countermeasure Assessment Tool to Control Access to Railway Property, Transport Canada, 2015

Conducted a literature review to identify trespassing risk factors. Gathered GIS data related to population, land-use, train volume, train speed, track characteristics, and trespassing related collisions. Used spatial analysis in ArcGIS to identify high risk areas. Developed a tool to proactively identify high risk areas for trespassing.

Ontario Traffic Manual (OTM) Book 11 – Pavement Markings and Delineation, Ministry of Transportation Ontario, Head Office, 2015

Reviewed the existing OTM Book 11. Identified deficiencies and summarized potential updates in light of the new MUTCDC published by TAC and updates to a number of OTM Books. Confirmed updates in consultation with the Ministry. Consultation with municipal stakeholders. Produced a publication a ready document with high quality graphics.

Operational Performance Review (OPR) Guidelines, Ministry of Transportation Ontario, Head Office, 2015

Reviewed the existing MTO OPR Guidelines. Identified deficiencies and summarized potential updates in light of configuration of the Safety Analyst software. Consultation with MTO regional representatives in a workshop. Updated the OPR Guidelines.

Comparative Analysis of the Field Performance of Highway De-Icing Materials, Ministry of Transportation Ontario, Northeast Region, 2015

Coordinated instrumentation of a Mobile Data Collection unit (MDCU) with various sensors including a friction trailer, spectral camera, windshield camera, and data logger. Acquired data from the MDCU, roadside cameras, and Road Weather Information Systems (RWIS). Integrated the acquired data. Developed mathematical regression models to compare the performance of pre-treated salt, wet salt, and dry salt at four different test areas in Ontario. Interviewed Area Maintenance Contractors (AMCs) to consider practical considerations.

Operational Performance Review of Highway 401 and Dixon Road Ramp Terminal, Ministry of Transportation Ontario, Central Region, 2015

Conducted Operational Performance Review (in-service road safety review) of the ramp terminal including a signalized intersection and a yield control intersection. Developed short term low cost and long-term countermeasures. Conducted cost benefit analysis.

Review of Roadside Safety Devices at 7 Locations, York Region, 2015

Reviewed five locations with existing guiderails and suggested improvements. Redesigned guiderails. Reviewed two locations for potential installation of guiderails.

Review of Flashing Beacon Warrant for the Intersection of Airport Road and Base Line, Sault Ste. Marie, 2015

Reviewed the newly developed warrants for installation of flashing beacons. Conducted benefit-cost analysis.

Regional Road 57 Class Environmental Assessment Study, Durham Region, 2015, (Cost of Work)

Conducted road safety review of the existing conditions for 3.7 km corridor of Regional Road

Operational Performance Review of Highway 401 and Dixon Road Ramp

Terminal, Ministry of Transportation Ontario, Central Region, 2015

Conducted Operational Performance Review (in-service road safety review) of the ramp terminal including a signalized intersection and a yield control intersection. Developed short term low cost and long-term countermeasures. Conducted cost benefit analysis.

Evaluation of End of Queue Warning Systems at the Interchange of Highway 401 and Gardiner's Road, Kingston, Ministry of Transportation Ontario, Eastern Region, 2015

Conducted a survey of four hundred participants to understand their reaction to the end of queue warning messages. Modelled the identified behaviour of drivers into VISSIM microsimulation model using the VISSIM Vehicle Actuated Programming. Evaluated the impacts of the end of queue warning systems on safety and operations of Highway 401 near the Gardiner's Road interchange.

Evaluation of Sequential Warning Lights, Ministry of Transportation Ontario, Eastern Region, 2015

Developed a data collection and evaluation plan. Supervised the data collection efforts for the treatment and comparison sites. Assessed the performance of the Sequential Warning Lights against regular barrels.

In-Service Road Safety Review, Ministry of Transportation Ontario, Eastern Region, 2014

Conducted in office collision review for the two sections of Highway 401 (20 km) using the Safety Analyst Software. Reviewed the findings of the site visit. Developed recommendations. Reviewed draft reports for each highway section.

Development of Safety Performance Functions (SPF) and Network Screening, City of London, 2015

Managed the day-to-day activities of the project. Developed methodologies to estimate AADTs for intersections with no AADT. Developed SPFs for various collision types and severity. Conducted network screening using the Empirical Bayes (EB)

method to identify intersections with potential for safety improvement.

Prioritization of Signalized Intersections for Operational Improvements in Halton Region, Halton Region, 2014

Ranked all signalized intersections in Halton Region based on their observed signal delay and their safety performance. Developed Synchro models for top twenty intersections. Recommended treatments for intersections improvements.

Operations Review of the Area near the QEW Ramp Terminal and Meadowvale Dr., St. Catharines, Ministry of Transportation Ontario, Central Region, 2015

Conducted a site visit of the study which included three signalized intersections and multiple stop control intersections. Developed a micro-simulation model in VISSIM. Calibrated and validated the micro-simulation model using vehicle trajectory data obtained from GreenOwl mobile. Validated queue lengths using footage obtained from MTO COMPASS cameras. Developed solutions to address operational problems in the study area.

Ontario Traffic Manual Book 15 – Pedestrian Facilities Re-write, Ministry of Transportation, Head Office, 2015

Developed a selection matrix to assist in identification of different types of pedestrian crossovers based on vehicular volumes, speed limit, and geometry of roads. Developed installation layouts for more than forty scenarios. Review of Book 15. Conducted stakeholder consultation. Day-to-day management of the project.

Operational Review of the Interchange of Highway 401 and Toronto Road, Ministry of Transportation Ontario, Eastern Region, 2014

Collected and compiled the required data. Developed, calibrated, and validated a microsimulation model in VISSIM for the existing scenario. Evaluated the performance of the interchange in the future and identified when the performance of the interchange is no longer acceptable. Evaluated the performance of two

alternative designs of the interchange in the future horizon.

Whistle Cessation Study, Township of Cramahe, 2014

Conducted Detailed Safety Assessment (DSA) of two crossings in the Township. Reviewed the crossings for possibility of whistle cessation. Developed the next steps for the Township to file a petition for whistle cessation.

In-Service Road Safety Review, Ministry of Transportation Ontario, Eastern Region, 2014

Conducted in office collision review for the two sections of Highway 401 (20 km) using the Safety Analyst Software. Reviewed the findings of the site visit. Developed recommendations. Reviewed draft reports for each highway section.

London Road Safety Strategy, City of London, 2014

Compiled collision and infrastructure inventory data for intersections. Identified collision contributing factors. Prioritized intersections based on their collision performance using the method of moments.

Safety Assessment of 14 At-Grade Railway Crossings, Halton Region, 2014

Collected data from the Region and railway companies. Developed a field data collection checklist considering the new Transport Canada's grade crossing standards. Supervised site visits. Assessed the compliance of at-grade crossings with the applicable standards and regulations. Recommended improvements to the deficient railway crossings. Developed a plan for Halton to ensure that all crossings are reviewed based on the new proposed Transport Canada's regulations.

Survey of Commuter Parking Lot Study, Ministry of Transportation, Eastern Region, 2014

Designed and conducted survey of occupancy and amenities of thirty-six parking lots in MTO Eastern Region. Designed and conducted Origin-Destination survey for the thirty-six parking lots. Compared each parking lot against MTO standards and

guidelines and recommended improvements where necessary. Consulted with local transit agencies. Developed travel forecasting models for each parking lot to identify space needs in the next 5, 10, and 20 years.

Update the Safety Analyst Software based on 2009 and 2010 Data, Ministry of Transportation, Head Office, 2014

Updated the SafetyAnalyst software using the 2009 and 2010 collision and traffic volume data. Re-calibrated the Ministry's Safety Performance Functions.

Development of Priority Lanes for Pan Am/Para Am Games, Greater Toronto and Hamilton Areas, Ministry of Transportation Ontario, Central Region, 2014

Analyzed the impact of the proposed Priority Lanes along Highways 401, 404, 427, 403, and the Queen Elizabeth Way. Identified capacity and geometric constrained areas. Developed alternative solutions to address the problems in the constrained areas and selected the preferred alternative. Developed design criteria for the Priority Lanes including the type of the buffer, signs, pavement markings. Developed schematic map drawings for the priority corridors. Identified locations for extended traffic monitoring during the Games. Proposed a methodology to conduct a before and after to evaluate the performance of the Priority Lanes.

Prioritization of Signalized Intersections for Operational Improvements, Halton Region, 2014

Ranked all signalized intersections in Halton Region based on their observed signal delay and their safety performance. Developed Synchro models for top twenty intersections. Recommended treatments for intersections improvements.

Deployment of a Red-Light Camera Program in the City of London, City of London, 2014

Conducted review of literature. Developed a methodology for identification of locations for red light cameras based on expected collision reductions. Ranked locations based on their expected safety benefits obtained from red light cameras. Conducted a detailed engineering review of candidate locations for

red light cameras. Conducted a sample violation study to identify potential revenue from red light cameras. Recommended locations suitable for red light cameras. Developed a business case for the red-light camera program.

Needs/Cost Benefit Study for Red Light Cameras, Durham Region, 2014

Conducted review of literature. Developed of a methodology for identification of locations for red light cameras based on expected collision reductions. Ranked locations based on their expected safety benefits obtained from red light cameras. Conducted a detailed engineering review of candidate locations for red light cameras. Conducted a sample violation study to identify potential revenue from red light cameras. Recommended locations suitable for red light cameras. Developed a business case for the red-light camera program.

Environmental Assessment (EA) Study (Schedule B) for the Intersections of Erin Mills Parkway, City of Mississauga, Peel Region, 2014

Conducted safety review of the existing conditions for the intersections of Erin Mills Parkway at Burnhamthorpe Road and Dundas Street East. Developed countermeasures to address safety issues identified. Conducted safety audit of the preferred alternative design.

Environmental Assessment (EA) Study (Schedule C) for Road Widening of Appleby Line and Harvester Road, City of Burlington, 2014

Conducted safety review of the existing conditions for a signalized intersection, stop control intersections, and road sections. Developed countermeasures to address the safety problems. Conducted safety audit of the preferred alternative design.

Road Safety Strategy Program, City of London, 2014

Reviewed City's historical collisions. Conducted cross tabulations of collisions data to identify the priorities in the City.

2012 Travel Time Studies, Ministry of Transportation Ontario, 2014

Managed day-to-day activities of the project for the GPS data obtained from TomTom, Developed the methodology to convert the data obtained from TomTom to travel time measures, and coded the methodology in VBA.

Evaluation of Safety Impacts of a New Interchange at Highway 406 and Third Avenue, Niagara Region, 2013

Estimated expected number of collisions for the existing conditions. Estimated the predicted number of collisions for the preferred alternative (after the construction of the interchange). Identified potential problem areas. Recommended solutions for the problem areas.

Deployment of a Red-Light Camera Program in the City of Kingston, City of Kingston, 2013

Conducted review of literature. Developed of a methodology for identification of locations for red light cameras based on expected collision reductions. Ranked locations based on their expected safety benefits obtained from red light cameras. Conducted a detailed engineering review of candidate locations for red light cameras. Conducted a sample violation study to identify potential revenue from red light cameras. Recommended locations suitable for red light cameras. Developed a business case for the red-light camera program.

Review of Safety Impacts of Static Electronic Advertising Signs and Bus Shelter Scrolling Advertisements, City of Toronto, 2013

Conducted literature review of the safety impacts of advertising signs. Conducted a jurisdictional scan in Ontario. Conducted review of sign by-laws and regulations in Canada, the US, Australia, and the UK. Conducted a before and after study to identify the impacts of bus shelter scrolling advertisements on safety at intersections.

Traffic Engineer Services on Retainer, Operational Assessment of Intersection of HWY7/HWY15, Ministry of Transportation Ontario, Eastern Region, 2013

Reviewed historical traffic volume and collisions at the study intersection. Conducted a site visit to identify compliance

of signs, pavement markings, and roadside safety devices with MTO standards. Developed a Synchro model for the study intersection. Identified operational deficiency at the intersection under six different scenarios. Proposed treatments to improve the intersection for each scenario.

Traffic Engineer Services on Retainer, Prioritize Warranted Signalized Intersections and Left Turn Lanes, Ministry of Transportation Ontario, Western Region, 2013

Obtained and collected data for un-signalized intersections which were warranted for signal installation as well as un-signalized intersections for which left turn lanes were warranted. Developed a methodology for prioritization of intersections based on safety improvements and operational improvements. Prioritized intersections for the Ministry.

Pedestrian Railway Safety Assessment, City of London, 2013

Conducted a review of literature to identify risk factors for pedestrians. Conducted a review of literature to identify treatments to reduce risks for pedestrians at grade railway crossings. Developed an application in MS-Excel using VBA to identify risks at crossings and propose treatments to mitigate risk. Developed a field checklist to assist the City for data collection from site visits and railway companies.

Traffic Engineering Services on Retainer, Ministry of Transportation Ontario, Eastern Region, 2013

Updated Justification 7 Projected Volumes for Ontario Traffic Manual (OTM) Book 12 (Traffic Signals). Updated Justification 6 - Pedestrian Volume and Delay for Ontario Traffic Manual (OTM) Book 12 (Traffic Signals). Developed a justification for addition of flashing beacons to two-way and all-way stopped controlled intersections.

Survey of Off-Road Vehicles and Motorized Snowmobile Vehicles, Ministry of Transportation Ontario Safety Policy and Education Branch, 2013

Managed day-to-day activities of the project. Supervised the development of an online

survey. Supervised data processing and analysis. Reviewed the deliverables.

Road Safety Audit Guidelines for Alberta, Alberta Transportation, 2013

Managed day-to-day activities of the project. Reviewed best practices through a jurisdictional scan. Conducted a survey of Alberta-Based road agencies. Development of deliverables.

The FHWA Signalized Intersection Informational Guide Update, SAIC, 2013

Managed day-to-day activities of the project, Reviewed the 2004 guideline and identified areas of improvement based on the newly published documents such as Highway Safety Manual for Chapter 6 (Safety) and Chapter 7.1 (Operations), and Drafted Chapter 6 (Safety) of the updated guide.

Development of Safety Performance Functions (SPF) and Network Screening, City of Mississauga, 2013

Managed the day-to-day activities of the project, Developed methodologies to estimate AADTs for intersections with no AADT, and Developed SPFs for various collision types and severity.

Site Selection for Deployment of Red-Light Cameras, Regional Municipality of York, 2013

Managed day-to-day activities of the project, Developed the methodology for identification of the most appropriate 4-leg signalized intersections for red-light cameras deployment, Developed a methodology for automate the site selection for the Region in TES. Conducted quality control of the results, and Reviewed deliverables of the project.

Traffic Engineering Services on Retainer – In-Service Road Safety Review, Various Locations, Ministry of Transportation Ontario, Eastern Region, 2013

Estimated potential for safety improvement for various collision impact type for road sections, freeway sections, and signalized intersections in the study area based on Highway Safety Manual.

Volume Production 2009-2010, Ministry of Transportation Ontario, 2013

Estimated volume of traffic at stations which do not have observations for any years based on a Geographically Weighted Regression Model, and compared the volumes obtained from GWR models with traditional regression models using an innovative approach.

Development of Safety Performance Functions (SPF) and Network Screening, City of Mississauga, 2013

Managed the day-to-day activities of the project, Developed methodologies to estimate AADTs for intersections with no AADT, and Developed SPFs for various collision types and severity.

Site Selection for Deployment of Red-Light Cameras, Regional Municipality of York, 2013

Managed day-to-day activities of the project, Developed the methodology for identification of the most appropriate 4-leg signalized intersections for red-light cameras deployment, Developed a methodology for automate the site selection for the Region in TES. Conducted quality control of the results, and Reviewed deliverables of the project.

Site Selection for Deployment of Red-Light Cameras, Regional Municipality of Halton, 2012

Managed day-to-day activities of the project, Developed the methodology for identification of the most appropriate 4-leg signalized intersections for red-light cameras deployment, Developed a methodology for automate the site selection for the Region in TES. Conducted quality control of the results, and Reviewed deliverables of the project.

Development of Safety Performance Functions (SPF) and Network Screening, York Region, 2012

Managed the day-to-day activities of the project, Conducted quality assessment of data, Developed SPFs for various collision types and severity.

Reviewing Speed Management Strategies and Engineering Measures, City of Edmonton, 2012

Developed the methodology for the study.

In-Service Road Safety Review of Six Locations in the Region of Halton, Regional Municipality of Halton, 2011

Conducted collision analysis using Empirical Bayes Method and over-representation analysis for four intersections and two road sections.

City of Hamilton Mobility Pedestrian Master Plan, City of Hamilton, 2011

Calculated probability of collisions involved pedestrians for road sections and intersections, Ranked road sections and intersections with high potential for safety improvements, Conducted a mobility analysis to identify challenges associated with pedestrian mobility in the City of Hamilton.

Development of Safety Performance Functions (SPF) and Network Screening, Regional Municipality of Peel, 2012

Conducted quality assessment of data, developed SPFs for various collision types and severity.

Site Selection for Deployment of Red-Light Cameras, Regional Municipality of Halton, 2012

Managed day-to-day activities of the project, Developed the methodology for identification of the most appropriate 4-leg signalized intersections for red-light cameras deployment, Developed a methodology for automate the site selection for the Region in TES. Conducted quality control of the results, and Reviewed deliverables of the project.

Development of Safety Performance Functions (SPF) and Network Screening, York Region, 2012

Managed the day-to-day activities of the project, Conducted quality assessment of data, Developed SPFs for various collision types and severity.

Reviewing Speed Management Strategies and Engineering Measures, City of Edmonton, 2012

Developed the methodology for the study.

Intersection Safety Devices Program Evaluation for Alberta, Alberta Ministry of Transportation, 2012

Developed Safety Performance Functions for different intersections in Alberta, Conducted a before and after study to estimate safety benefits associated with red light cameras and speed cameras in Alberta.

Alternative Methodologies for Travel Time Studies, Ministry of Transportation Ontario, Central Region, 2012

Managed day-to-day activities of the project. Collected travel time data from various wireless technologies, Processed travel time data from various wireless technologies, Compared travel time information with the Ministry benchmark, and ranked various technologies using a multi-criteria decision-making process.

Development of Safety Performance Functions (SPF) and Network Screening, Regional Municipality of Peel, 2012

Conducted quality assessment of data, developed SPFs for various collision types and severity.

Provincial Expansion Prioritization Pilot Projects, Ministry of Transportation Ontario, 2011

Reviewed the methodology developed by the Ministry to evaluate expansion projects from safety perspectives. Conducted a review of literature to find a methodology to assess safety of High Occupancy Vehicle (HOV) lanes for provincial highways in Ontario.

In-Service Road Safety Review of Six Locations in the Region of Halton, Regional Municipality of Halton, 2011

Conducted collision analysis using Empirical Bayes Method and over-representation analysis for four intersections and two road sections.

Update of the Ministry of Transportation Traffic Impact Study Guidelines, Ministry of Transportation Ontario, Head Office, 2011

Conducted a comprehensive jurisdictional scan of Traffic Impact Study, Developed several options to update the existing guide with respect to roundabouts and road safety analyses, and drafted the updated guidelines.

City of Hamilton Mobility Pedestrian Master Plan, City of Hamilton, 2011

Calculated probability of collisions involved pedestrians for road sections and intersections, Ranked road sections and intersections with high potential for safety improvements, Conducted a mobility analysis to identify challenges associated with pedestrian mobility in the City of Hamilton.

Volume Production 2007-2008, Ministry of Transportation Ontario, 2011

Estimated volume of traffic at stations which do not have observations for any years based on a Geographically Weighted Regression Model. Compared the volumes obtained from GWR models with traditional regression models using an innovative approach.

Assessment of Speed Limit Reduction, City of Montreal, 2011

Conducted a comprehensive literature review on parameters that affect operating speed, Developed regression models for different zones in the City of Montreal to perform a cross sectional analysis, Performed a before and after study to estimate changes in safety for zone whose speed limits reduced to 40km/h.

Safety and Operational Evaluation of the Proposed Alternatives - Road 323, Brebeuf, Quebec, Ministry of Transportation Quebec, 2010

Compared alternative designs in terms of safety and operations using IHSDM.

Reconfiguration and Redevelopment of Road 117, Labelle, Ministry of Transportation Quebec, 2010

Performed a safety and capacity analysis using FHWA Interactive Highway Safety Design Model (IHSDM) to assess the existing conditions. Compared alternative designs in terms of safety and operations using IHSDM.

Safety Review for Highway 50 and Provincial Road 148, Gatineau, Ministry of Transportation Quebec, 2010

Conduct benefit-cost analysis to choose the preferred solution for improvement safety along Highway 50 and Provincial Road 148.

Trafalgar Road Transportation Corridor from Steeles Avenue to Highway 7 Traffic Operations Study, Halton Region, 2010

Conducted collision analysis of the study area, Conducted network screening analysis along the study area

Evaluation of at-grade crossing at Chemin Saint Dominique, Winchester Subdivision, Quebec, Ministry of Transportation Quebec, 2009

Evaluated the proposed plan (where Canadian Pacific Railway proposed to add a new sliding near the at grade intersection) with RTD 10 (Road/Railway Grade Crossings).

Speed Limit Study, Town of Grimsby, Region of Niagara, 2009

Managed speed, geometric, and surrounding area data collection, Analyzed collision history and predicted long term collision history for different links using Empirical Bayes method, Analyzed speed, volume, and other relevant data, Recommended new speed limits for the study area, Drafted the final report.

Traffic Data Manager Functions for New Generation COMPASS System, Ministry of Transportation Ontario, 2009

Developed a series of fudge factors to improve MTO travel time estimation/prediction algorithm on a section of Highway 401.

Matrix-Integrated Traffic Data Management System, Regional Municipality of Durham, 2009

Developed a network screening algorithm for the region.

San Francisco Bay Area-511, Bay Area San Francisco, Science Applications International Corp (SAIC), Metropolitan Transportation Commission, 2009

Reviewed current data collection technologies in the Bay Area 511 system, Reviewed current network performance monitoring program. Reviewed current data processing algorithms.

Deployment of a Travel Time Prediction Testbed and Model, Highway Infrastructure

Innovation Funding Program, Ministry of Transportation Ontario, 2009

Managed a travel time survey consisting of probe vehicles equipped with GPS (to emulate mobile phone probes) and video cameras (to capture the true travel times), Analyzed probe vehicle GPS data to obtain vehicles' trajectories, Developed a methodology to estimate travel time on freeways based on probe vehicles' trajectory data.

Associations

- Canadian Institute of Transportation (CITE), Vice President, Since 2022.
- Canadian Institute of Transportation (CITE), Treasurer/Secretary (2019-2021).
- Transportation Association of Canada (TAC), Road Safety Committee, Past Chair, Since 2022.
- Transportation Association of Canada (TAC), Road Safety Committee, Chair (2019-2021).
- Transportation Association of Canada (TAC), Scholarship Review Committee, 2012 and 2013.
- Transportation Association of Canada (TAC), Road Safety Standing Committee, Road Safety Professionals Designation Sub-Committee, Co-Chair, 2013 - 2015.
- Transportation Association of Canada (TAC), Road Safety Standing Committee, Project Idea Development and Initiation Sub-Committee, 2012-2014.
- Transportation Association of Canada (TAC), Road Safety Standing Committee, Member, Since 2011.
- The CITE Road Safety Program Self-Assessment Project, Co-Chair (2010-2013).
- ITS Canada Technical Program Committee for 2010 Annual Conference and General Meeting (2009-2010).
- Canadian Institute of Transportation (CITE), Technical Liaison Committee (2008-2015).

Publications/Presentations

- Zarei, M., Hellinga, B., Izadpanah, P. (2022) A Quantitative Method to Determine When Safety Performance Functions Used for Network Screening Should be Redeveloped, Transportation Research Board (TRB) 10th Annual Meeting, Washington D.C.
- Zarei, M., Hellinga, B., Izadpanah, P. (2021) CGAN-EB: Empirical Bayes Estimates for Crash Hotspot Identification Using Conditional Generative Adversarial Networks: A Simulated Crash Data Study, Accident Analysis & Prevention Journal.
- Izadpanah, P. (2020) The Evolution of Road Safety Data and Analytics, Transportation Association of Canada Annual Meeting and Conference, Closing Plenary Session.
- Salek, S., Izadpanah, P., Perchanok, M., and Hadayeghi, A. (2016) Comparative Analysis of Performance of Different De-icing Materials, the 2016 Conference of the Transportation Association of Canada, Toronto, Ontario.
- Omrani, R., Izadpanah, P., Zervos, N., and Hadayeghi, A. (2015) Operational Ranking of Intersections: A Novel Prioritization Methodology, the 2015 Conference of the Transportation Association of Canada, Charlottetown, PEI.
- Izadpanah, P., Hawash, K., Hadayeghi, A. (2015), Is Your Jurisdiction Prepared for the New At-Grade Railway Crossings Regulations?, Canadian Institute of Transportation Engineers Annual Conference, Regina, Saskatchewan, Canada.
- Izadpanah, P., Thukral, S., Zarei, H., Hadayeghi, A. (2015) Safety Evaluation of Red-Light Camera and Intersection Speed Camera Programs in Alberta, Transportation Research Board, 94th Annual Meeting, Washington D.C.
- Izadpanah, P., Omrani, R., Koo, S., Hadayeghi, A. (2014) Effect of Static Electronic Advertising Signs on Road Safety: An Experimental Case Study. the Journal of Orthopedic Trauma Supplement: Road Traffic Safety, 28, S33-S36.
- Omrani, R., Izadpanah, P., Nikolic, G., Hellinga B., Hadayeghi, A., Abdelgawad, H. (2013) Evaluation of Wide-Area Traffic Monitoring Technologies for Travel Time Studies. Transportation Research Record: Journal of the Transportation Research Board, No. 2380, Transportation Research Board of the National Academies, Washington, D.C., pp. 108-119.
- Izadpanah, P., Aashtiani, H.Z. (2012) Application of Path Information in Network Design Problem. Journal of Transportation Engineering, American Society of Civil Engineers, Vol 138, Issue 7, pp. 863-870.
- Hellinga, B., Izadpanah, P., Fu., L., and Takada, H. (2008) Decomposing Travel Times Measured by Probe-based Traffic Monitoring Systems to Individual Road Segments. Transportation Research Part C, Vol 16, Issue 6, pp. 768-782.
- Izadpanah, P., Thukral, S., Zarei, H., Hadayeghi, A. (2015) Safety Evaluation of Red-Light Camera Program in Alberta. Accepted for Presentation at the Transportation Research Board Annual Meeting, Washington D.C.
- Solomon, H., Izadpanah, P., Brady, M., and Hadayeghi, A. (2014) So You're Considering a Red-Light Camera Program? – Lessons and Insights from Over a Decade of Camera Operation in South and Central Ontario, Transportation Association of Canada, Montreal, Quebec.
- Izadpanah, P., Elmadhoon, M., Hawash, K., Rouhieh, B., Hadayeghi, A. (2014) Improving Pedestrian Safety at Grade Railway Crossings. The 2014 Canadian Institute of Transportation Engineers Conference, Kitchener, Ontario.
- Omrani, R., Izadpanah, P., Zervos, N., Hadayeghi, A. (2014) Evaluation of Speed Management Strategies: A Before and After Study. The 2014 Conference of the

- Transportation Association of Canada (TAC), Montreal, Quebec, Canada.
- Thukral, S., Izadpanah, P., Pardo, M., Pachova, B., Nichol, S., Hadayeghi, A., (2013) Diagnosis of Safety Problems Using SafetyAnalyst for Efficient and Effective Safety Management. the 2013 Conference of the Transportation Association of Canada (TAC), Winnipeg, Manitoba, Canada.
 - Izadpanah, P., Nichol, S., Hadayeghi, A., (2012) Configuration of SafetyAnalyst Software for Efficient and Effective Safety Management. the 2012 Conference of the Transportation Association of Canada (TAC), Fredericton, New Brunswick, Canada.
 - Izadpanah, P., Nichol, S., Hadayeghi, A., (2013) Configuration of SafetyAnalyst: An Ontario Experience. 2013 Canadian Institute of Transportation Engineers Annual Conference, Calgary, Alberta.
 - Olia, A., Izadpanah, P., Razavi, S.N. (2012) Construction Work Zone Traffic Management Using Connected Vehicle Systems. Canadian Society of Civil Engineers, 9th International Transportation Specialty Conference, Edmonton, Alberta.
 - Izadpanah, P., Hadayeghi, A., Nolet, A. (2012) Identification of Problem Locations for Pedestrian Facilities Using Limited Available Data. the Canadian Association of Road Safety Professionals (CARSP), Banff, Alberta, Canada.
 - Izadpanah, P., Kreider, T.M., Manaugh, K., Hadayeghi, A., El-Geneidy, A.M., Miranda-and Moreno, L.F. (2011) Evaluating the Effect of Speed Limit Reduction from 50 km/h to 40 km/h on Operating Speed: A Cross-Sectional Analysis. the Canadian Association of Road Safety Professionals, Halifax, Nova Scotia, Canada.
 - Izadpanah, P., Hellinga, B., and Fu, L. (2011) Real-Time Freeway Travel Time Prediction Using Vehicle Trajectory Data. The 90th Transportation Research Board Annual Meeting in Washington, D.C, January 23 – January 27.
 - Izadpanah, P., Hellinga, B., and Fu, L. (2009) Automatic traffic shockwave identification using vehicles' trajectories. The 88th Transportation Research Board Annual Meeting, 11-15 January 2009, Washington D.C.
 - Izadpanah, P., and Hellinga, B. (2008) Freeway travel time estimation/prediction using data from mobile phone probes. 2008 Annual Conference of the Canadian Institute of Transportation Engineers, 27-30 April 2008, Victoria, British Columbia, Canada.
 - Izadpanah, P., and Hellinga, B. (2007) Wide area traffic conditions monitoring: reality or wishful thinking? 2007 Annual Conference of the Canadian Institute of Transportation Engineers, 6-9 May 2007, Toronto, Ontario, Canada.
 - Izadpanah, P., Merritt, R., Szejber, G., Hadayeghi, A., (2013) Site Selection for Deployment of Red-Light Cameras in the Region of Halton. Ontario Traffic Council, Ottawa, Ontario, Canada.
 - Omrani, R., Izadpanah, P., Nikolic, G., Hellinga, B., Hadayeghi, A., (2013) Evaluation of Travel Time Data Collection Technologies: An Innovative Approach for a Large-Scale Network. Intelligent Transportation Systems (ITS) Canada, Annual Conference and General Meeting, Toronto, Ontario, Canada.
 - Izadpanah, P., Merritt, R., Hadayeghi, A., Malone, B. (2013) Site Selection for Deployment of Red-Light Cameras. Institute of Transportation Engineers (ITE) Technical Conference and Exhibit, San Diego, California, USA.
 - Izadpanah, P., and Hellinga, B. (2007) Obtaining Traffic Conditions by Tracking Cell Phones: Existing Systems and Remaining Challenges. Intelligent Transportation Systems (ITS) Canada, Annual Conference and General Meeting, April 29 to May 1, 2007, Niagara Falls, Ontario, Canada.
 - Izadpanah, P., and Hellinga B., (2008) Obtaining Traffic Conditions by Tracking Cell Phones: Existing Systems and Remaining Challenges CITE Joint Toronto

and Hamilton Sections, March 2008,
Mohawk College, Hamilton, Ontario.

- Zarei, H. and Izadpanah, P. (2000) Wind catchers: the cooling systems in traditional Iranian architecture. Sharif Civil Magazine, vol. 26.
- Izadpanah, P. (2000) Ground Respond Analysis in Southern of Tehran, Sharif University of Technology, BSc final project.