QUANTIFYING GREENHOUSE GAS GENERATION FOR ROADWAY MAINTENANCE, REHABILITATION AND RECONSTRUCTION TREATMENTS  
Marlis Foth, M.Sc. Candidate / Construction Project Manager Neighbourhood Renewal, University of Saskatchewan / City of Edmonton; Curtis Berthelot

GREEN DECISION MAKING FRAMEWORK FOR PAVEMENT SURFACE REHABILITATIONS  
Paul Christensen, Senior Economist and Decision Analyst, VEMAX Management Inc.; Gordon Sparks; Thomas Davies; David Stearns; Nicole Allen; Darian Brown

PRODUCTION OF CLEANER HOT MIX ASPHALT (CHMA) IN CANADA  
Ali Jamshidi, School of Engineering, University Sains Malaysia; Meor Othaman Hamzah

IMPLEMENTATION OF GHG TRACKING SOFTWARE FOR SUSTAINABLE TRANSPORTATION INFRASTRUCTURE PROJECTS  
Robert Burak, President, Canadian Precast/Prestressed Concrete Institute; Jamie Meil

COMPTABILISATION DES GES DANS LE CADRE DE LA RÉALISATION D’UN PROJET ROUTIER: LE CAS DU PROJET TURCOT À MONTRÉAL  
Sylvie Tanguay, adjointe de recherche, ministère des Transports du Québec

CALCULATING GHG EMISSIONS WITHIN THE CONTEXT OF A ROADWORK PROJECT: THE TURCOT CASE IN MONTRÉAL  
Sylvie Tanguay, Research Assistant, ministère des Transports du Québec

REDUCTION OF GREENHOUSE GAS EMISSIONS THROUGH UTILIZATION OF TURF AND ROOT REINFORCEMENT MAT (TRM) TECHNOLOGY IN GREEN ARMOURING OF CIVIL STRUCTURES AS COMPARED TO TRADITIONAL ROCK ARMOURING  
Ian Corne, Application Specialist, Erosion and Sediment Control, Nilex Civil Environmental Group

TRANSPORTATION INFRASTRUCTURE : CLIMATE CHANGE: VULNERABILITY, RISK, & ADAPTATION  
Terry Zdan, Policy & Service Development, Manitoba Infrastructure & Transportation

ALBERTA TRANSPORTATION CLIMATE CHANGE RISK ASSESSMENT AND ADAPTATION STRATEGY  
Peter Dzikowski, Senior Policy Advisor, Environmental Issues, Strategic Policy Branch, Alberta Transportation

THE IMPLICATIONS OF CLIMATE CHANGE FOR ROAD SAFETY IN CANADIAN CITIES
Jean Andrey, Professor, Department of Geography and Environmental Management, University of Waterloo

**ASSESSING CLIMATE CHANGE RISK TO STORMWATER & WASTEWATER INFRASTRUCTURE FOR THE CITY OF WELLAND**  138
Marvin Ingebrigtsen, Technical Analyst Infrastructure Programs, Infrastructure Services, City of Welland

**CITY’S CLIMATE CHANGE RISK ASSESSMENT**  161
Nazzareno Cappanno, Manager, Operational Planning & Policy, City of Toronto, Transportation Services Division

**HURON ROAD RECONSTRUCTION**  171
Binu Korah, Manager, Development Engineering, City of Kitchener

**ACADEMY FOR MUNICIPAL ASSET MANAGEMENT**  173
Heather Crewe, Manager, Professional Development & Training, Ontario Good Roads Association

**INFRASTRUCTURE ENGINEERING OPTION IN ENGINEERING SCIENCE**  203
Matthew Roorda, Associate Professor, University of Toronto

**BRIDGE TRAINING PROGRAM USING THE CANADIAN HIGHWAY BRIDGE DESIGN CODE**  209
Edward Li, Vice-President, Transportation and Civil Structures, Morrison Hershfield Ltd.

**GESTION DE LA MISE EN OEUVRE DES TRAVAUX D’INFRASTRUCTURES ROUTIÈRES ET MUNICIPALES (MANAGEMENT OF IMPLEMENTATION OF MUNICIPAL AND ROAD INFRASTRUCTURE WORKS TRAINING PROGRAM)**  248
Line Rousseau, Engineer, Director / ingénieure directrice, Technical Programs / Programmes techniques, Association québécoise des transports

**SYSTÈME INNOVATEUR DE GESTION DES EAUX DE RUISSELLEMENT DE L’AXE ROUTIER 73/175 SECTEUR STONE-TEWKESBURY (QUÉBEC)**  261
(INNOVATIVE RUNOFF DRAINAGE MANAGEMENT SYSTEM IN THE STONEHAM-TEWKESBURY SECTION OF THE HIGHWAY 73/175 RECONSTRUCTION PROJECT)
Yves Bédard, Biologist / biologiste, ministère des Transports du Québec

**TAC - PILOT PROJECT TO TEST THE FEASIBILITY OF TIRE-DERIVED-AGGREGATE (TDA) AS A ROADWAY EMBANKMENT FILL MATERIAL AND PAVEMENT**
INSULATION LAYER IN ALBERTA  274
Alireza Bayat, Assistant Professor, University of Alberta

WILDLIFE PASSAGE AND ENHANCED ENVIRONMENT FEATURES ON HIGHWAY 26 NEW, WASAGA BEACH TO COLLINGWOOD  282
Susan Sieradzki, Senior Environmental Planner, Ontario Ministry of Transportation

SUSTAINABLE PAVEMENT TECHNOLOGIES: DOING MORE WITH LESS  N/A
Jason Miron, C.E.T., Project Manager, Associate, R.V. Anderson Associates Limited, and Bob Wicklund, Project Manager, Regional Municipality of Halton

CASE STUDY: DESIGN OF THE HIGHWAY 406 TERMINATION ROUNDBABOUT  292
Phil Weber, Service Group Manager, Roundabouts, GHD

THE PEMBINA HIGHWAY BUFFERED BIKE LANES PROJECT - A SOLUTION TO MANAGING CYCLISTS, BUSES AND PEDESTRIANS AT TRANSIT STOPS  307
Scott Suderman, Streets Planning Engineer, City of Winnipeg - Public Works Department, Transportation Division; Judy Redmond

MULTIVARIABLE ANALYSIS OF ROUNDBOUD VERSUS TRAFFIC SIGNALS - A CASE STUDY IN ALBERTA  324
Jorge Arango, Transportation Planner, MMM Group Limited; Bosco Tong

ACCURACY LIMITS OF GEOMETRIC ANALYSIS BASED ON DATA COLLECTION VEHICLES  339
Andrew Howard, Pavement Analyst, Fugro Roadware; D.J. Swan

DESIGN AND IMPLEMENTATION OF SLOT LEFT-TURN LANES ON THE MANITOBA HIGHWAY NETWORK  359
Brent Hartmann, Project Design Engineer, Manitoba Infrastructure and Transportation; Derek Durant

CHALLENGES, RISKS AND SUCCESSES IN THE CONSTRUCTION OF THE LAKE ST. MARTIN EMERGENCY CHANNEL  372
Ron Weatherburn, Executive Director, Construction and Maintenance, Manitoba Infrastructure and Transportation; Eric Blais

INVESTIGATING THERMAL CRACKING POTENTIAL OF ONTARIO RAP-HMA MIXTURES  392
Doubra Charles Ambaiowei, PhD Candidate, University of Waterloo; Xiomara Sanchez; Safiuddin Md; Susan Tighe; Vince Aurilio
A COMPARISON OF TRAFFIC ACCOMMODATION GUIDELINES IN ALBERTA FROM A PRACTICAL PERSPECTIVE  402
Jeffrey Lo, Designer, Engineer in Training, MMM Group Limited; Bosco Tong

DELIVERY OF CENTREPORT CANADA WAY  418
Donald McRitchie, Team Leader, Major Initiatives Team, Manitoba Infrastructure and Transportation; Eric Christiansen; Ruth Eden; Archie Miller

WINNIPEG’S FIRST RAPID TRANSIT CORRIDOR - SOUTHWEST TRANSITWAY  440
Dave Krahn, Partner, Dillon Consulting Limited

TIME SENSITIVE AND EFFECTIVE PAVEMENT CONSTRUCTION ON RUNWAY 08-26 AT WATERLOO AIRPORT  460
Ludomir Uzarowski, Principal, Golder Associates Ltd.; Rabiah Rizvi; John Hammer; Chris Wood, Andrew Turner

INFORMATION ON DEMAND: IN-HOUSE DEVELOPMENT OF A HIGHWAY PRESERVATION DATABASE SYSTEM  471
Nichole Andre, Asset Management Engineer, Saskatchewan Ministry of Highways & Infrastructure; Raymond Gerke; Karl Lehmann

PROPOSED SYSTEM FOR CO-ORDINATING SPRING LOAD RESTRICTIONS ACROSS ONTARIO  485
Max Perchanok, Research Coordinator, Ontario Ministry of Transportation; Heather McClintock; Steve Birmingham; Juan Pernia; Robert Timoon

OPERATING AND MAINTAINING MEDIAN HIGH TENSION CABLE BARRIER ON HIGHWAY 2 IN ALBERTA  495
Tony Churchill, Transportation Engineer, EBA, A Tetra Tech Company; Masood Hassan, Bryan Ngo; Crystal Morison; Lynden Fischer; Kurt Wilkie

DEVELOPING SUPPLEMENTAL URBAN GUIDELINES FOR NEW BRUNSWICK’S WORK AREA TRAFFIC CONTROL MANUAL  514
Karen Robichaud, Opus International Consultants (Canada) Ltd.; Darren Charters

EVALUATING AUTOMATED ANTI-ICING TECHNOLOGY TO REDUCE TRAFFIC COLLISIONS  531
Rod Klashinsky, Vice-President, Sales & Special Projects, International Road Dynamics Inc. and Kenneth Day, Project Manager, Boschung America, LLC; Randy Hanson; Eric Cottone

A MULTIPLE INDEX APPROACH FOR MEASURING WINTER SEVERITY AND MAINTENANCE NEEDS  547
Max Perchanok, Research Coordinator, Ontario Ministry of Transportation; Ramona Mirtorabi; Liping Fu
A SYSTEMATIC APPROACH FOR LOCATING ROAD WEATHER INFORMATION SYSTEM (RWIS) STATIONS IN CANADA  548
Tae J. Kwon, Innovative Transportation System Solution (iTSS) Lab, Department of Civil & Environmental Engineering, University of Waterloo; Liping Fu; Max Perchanok; Heather McClintock

GUIDELINES FOR SELECTING SIGN SHEETING TO MEET MINIMUM RETROREFLECTIVITY LEVELS  N/A
Karen Robichaud, Opus International Consultants (Canada) Ltd.; Jeff Bagdade; Paul Carlson

WINTER ROAD MAINTENANCE - A COMPARISON OF ALTERNATIVE PERFORMANCE MEASURES AND SERVICE STANDARDS  549
Liping Fu, Innovative Transportation System Solution (iTSS) Lab, Department of Civil & Environmental Engineering, University of Waterloo; Johnny Cao; Tae J. Kwon; Lalita Thakali; Max Perchanok; Heather McClintock

ONTARIO’S MOVE TO HOT MIX ASPHALT PAVEMENT SMOOTHNESS ACCEPTANCE USING HIGH SPEED INERTIAL PROFILERS  550
Becca Lane, Manager, Materials Engineering and Research Office, Ministry of Transportation Ontario; Chris Raymond; Alexander (Sandy) Brown; Pamela Marks; Seyed Tabib

MECHANISTIC DESIGN: A MODELING CASE STUDY FOR THE CITY OF SASKATOON  562
Roberto Soares, Senior Project Engineer, PSI Technologies Inc.; Duane Guenther; Rielle Haicher; Curtis Berthelot

MIGRATING THE CITY OF CALGARY FROM A STATIC ROAD NETWORK DEFINITION TO A DYNAMIC ROAD NETWORK DEFINITION  577
Leanne Whiteley-Lagace, Pavement Management Team Lead, Infrastructure Management & Pavement Engineering, Stantec Consulting Ltd.; Khaled Helali; Mohammad Karim; Joe Chyc-Cies

RESILIENT MODULUS AND SEGREGATION POTENTIAL ESTIMATION FROM SIMPLIFIED LABORATORY PROCEDURE  597
Jean-Pascal Bilodeau, Research Engineer, Department of Civil Engineering, Laval University; Guy Doré; Dario Soto Tafur

IMPLEMENTING THE AASHTOWARE PAVEMENT ME DESIGN GUIDE: MANITOBA ISSUES AND PROPOSED APPROACHES  605
M. Alauddin Ahammed, Pavement Design Engineer, Manitoba Infrastructure and Transportation; Said Kass; Stan Hilderman
TAC PAVEMENT ME USER GROUP - CANADIAN CLIMATE TRIALS 624
Mark Popik, Senior Pavement Engineer, Thurber Engineering Ltd.; Susanne Chan; Marta Juhasz; Hugh Donovan; Denis St-Laurent

SENSITIVITY OF PAVEMENT ME DESIGN PREDICTED DISTRESSES TO ASPHALT MATERIALS INPUTS 637
Ahmed Shalaby, Professor and Head, Department of Civil Engineering, University of Manitoba; Saman Esfandiarpour; Said Kass; M. Alauddin Ahammed; Tara Liske

FLEXIBLE PAVEMENT DESIGN FOR FROST PROTECTION TAKING INTO ACCOUNT SUBGRADE SOILS VARIABILITY 652
Guy Doré, Professor, Laval University; Jean-Pascal Bilodeau

LONG-TERM PERFORMANCE OF FLEXIBLE PAVEMENT STRUCTURES IN A CHANGING CLIMATE 661
François Perron Drolet, Master Student, Department of Civil Engineering, Laval University; Guy Doré; Papa Masseck Thiam; Jean-Pascal Bilodeau

TEN YEAR PERFORMANCE EVALUATION OF UNBONDED CONCRETE OVERLAY AND JOINTED PLAIN CONCRETE PAVEMENT: A TORONTO CASE STUDY 671
Aleks Kivi, MASc Candidate, Centre for Pavement and Transportation Technology, Department of Civil and Environmental Engineering, University of Waterloo; Susan Tighe; Rico Fung; Jozef Grazek

DEVELOPMENT OF A PAVEMENT DEGRADATION FEE STRUCTURE FOR THE CITY OF TORONTO 685
Nazzareno Capano, Manager, Operational Planning and Policy, Transportation Infrastructure Management Section, Transportation Services Division, City of Toronto; Abe Mouaket

WHY CONCRETE INTERSECTIONS MAKE GOOD SENSE 699
Mick Prieur, Senior Pavement Engineer, Ready Mixed Concrete Association of Ontario; Dave Morris

ROAD UTILITY CUTS AND REPAIRS - APPLYING KEYHOLE TECHNOLOGY 719
Michael L. J. Maher, Principal, Golder Associates Ltd.

A COMPARISON OF RIDE IMPROVEMENT FOR VARIOUS ROADWAY REHABILITATION METHODS IN WESTERN CANADA N/A
Darel Meshier, Chief Technical Officer, EBA, a Tetra Tech Company; Bryan Palsat; Chuck McMillan; Dave Palsat; Brad Hogg

C-LTPP DATABASE: HOW CAN WE CAPITALIZE ON THIS VALUABLE DATA? 740
Richard Korczak, Centre for Pavement and Transportation Technology, Civil and
Environmental Engineering,  
University of Waterloo; Susan Tighe  

**COMPARATIVE EVALUATION OF FWD AND BENKELMAN BEAM DEFLECTIONS IN SASKATCHEWAN**  N/A  
Andrew Coe, Senior Pavements Engineer, EBA, A Tetra Tech Company; Ania Anthony; Cherie Fuchs  

**ECONOMIC ANALYSIS ON THE USE OF RECYCLED AGGREGATES IN A ROADWAY STRUCTURE**  741  
Roberto Soares, Senior Project Engineer, PSI Technologies Inc.; Duane Guenther; Colin Wandzura; Rielle Haichert; Curtis Berthelot  

**ESTIMATING PAVEMENT MACRO-TEXTURE MEAN PROFILE DEPTH FROM ONE IMAGE**  N/A  
Qingfan Liu, PhD Candidate, Department of Civil Engineering, University of Manitoba; Ahmed Shalaby  

**EVALUATION OF CRUMB RUBBER MODIFIER IN ONTARIO HOT MIX ASPHALT: A CASE STUDY**  743  
Mohamed Hegazi, MASc Candidate, Centre for Pavement and Transportation Technology, University of Waterloo; Susan Tighe  

**EVALUATION OF LIGHT WEIGHT DEFLECTOMETER (LWD) FOR CHARACTERIZATION OF SUBGRADE SOIL MODULUS**  744  
Alireza Bayat, Assistant Professor, University of Alberta; Mohammad Shafiee; Somayeh Nassiri  

**FIELD EVALUATION OF CUPOLEX® AS AN INNOVATIVE CONCRETE PAVEMENT TECHNOLOGY**  745  
Aleks Kivi, MASc Candidate, Centre for Pavement and Transportation Technology, University of Waterloo; Susan Tighe; David Hein  

**HEAVY WEIGHT DEFLECTOMETER STUDY OF CITY OF SASKATOON INTERCHANGE RAMPS: MEASURING STRUCTURAL CAPACITY FOR THE CITY’S PAVEMENT MANAGEMENT SYSTEM**  N/A  
Roberto Soares, Senior Project Engineer, PSI Technologies Inc.; Duane Guenther; Diana Podborochynski; Vanessa Garcia; Colin Prang; Curtis Berthelot  

**SUSTAINABLE PAVEMENT DESIGN: DOING MORE WITH LESS**  746  
Jason Miron, C.E.T., Project Manager, Associate, R.V. Anderson Associates Limited; Bob Wicklund  

**THE COST IMPLICATIONS OF USING VARIOUS FLEXIBLE PAVEMENT METHODOLOGIES FOR CANADIAN MUNICIPALITIES**  N/A
Alain Duclos, MASc Candidate, Centre for Pavement and Transportation, University of Waterloo, Senior Pavement Engineer, LVM; Susan Tighe

THE INTEGRITY OF IRI DATA AT LOW SPEED  759
Andrew Howard, Pavement Analyst, Fugro Roadware; D.J. Swan

USE OF PERVERSIVE CONCRETE AS AN OPEN GRADED DRAINAGE LAYER IN PAVEMENT STRUCTURES  760
Vimy Henderson, Pavement and Materials Engineering, Golder Associates Ltd.; Ludomir Uzarowski; Carlos Midence; Tim Smith

EVALUATION OF ONTARIO'S PAVEMENT DESIGN METHODOLOGY  761
A. Hamdi, A. Tabassum, S. Tighe, University of Waterloo

ACCESS MANAGEMENT - NOT ALWAYS FRONTAGE ROADS  762
Sandra Menzies, Senior Transportation Engineer, CH2M HILL Canada Limited

ACHIEVING SUCCESS THROUGH INNOVATION - BUILDING A ROAD, BUILDING BENEFITS  781
Julie Frederickson, Crown Counsel, Manitoba Department of Justice

GUIDELINES FOR PLANNING AND IMPLEMENTATION OF TRANSIT PRIORITY MEASURES (TPM) IN URBAN AREAS  793
Ron Stewart, Director, IBI Group; Roland Wong

CRITICAL PARAMETERS GOVERNING THE PLANNING OF CALGARY’S AIRPORT TRAIL AS AN EFFECTIVE EAST-WEST CONNECTOR  809
Kennith Lin, Transportation Planner, Engineer in Training, MMM Group Limited; Bosco Tong; Naveed Butt

TRANSITWAYS AND THE ROUTE AHEAD FOR CALGARY TRANSIT  830
Chris Jordan, Manager, Special Projects, City of Calgary; Jennifer Malzer

ISSUES AND STRATEGIES INVOLVED IN DEVELOPING AGENT-BASED MULTIMODAL NETWORK MODEL FOR TRANSPORTATION PLANNING AND SIMULATION: LESSONS AND METHODS FROM A CASE STUDY ON THE GREATER TORONTO AND HAMILTON AREA  845
Adam Weiss, Department of Civil Engineering, University of Toronto; Mohamed Mahmoud; Peter Kucirek; Khandker Habib

PRINCIPLES FOR ADDRESSING URBAN TRAFFIC MONITORING CHALLENGES  860
Garreth Rempel, Principal, MORR Transportation Consulting Ltd.; Jeannette Montufar; Jonathan Regehr
INTEGRATING CYCLING IN OTTAWA-GATINEAU TRAVEL FORECASTING MODEL  873
Rochan Kumar, Transportation Modeler, Parsons Brinkeroff; Ahmad Subhani; Don Stephens; Peter Vovsha

A DEMAND FORECASTING METHODOLOGY FOR LAND-BASED PORTS OF ENTRY  893
Jake Kosior, Senior Transportation Planner, Manitoba Infrastructure and Transportation; David Lettner

DEVELOPING AND APPLYING A LEVEL-OF-SERVICE FRAMEWORK TO PORT-OF-ENTRY INFRASTRUCTURE PLANNING  910
David Lettner, Senior Planning Consultant, Manitoba Infrastructure and Transportation; Jake Kosior

PHOTO RADAR AND RED LIGHT CAMERA SYSTEM FOR TRAFFIC MANAGEMENT  926
Catherine Berthod, Engineer and Urban Planner, ministère des Transports du Québec

ROUTE 1 GATEWAY PROJECT – SAFETY ENHANCEMENTS TO EXISTING SECTIONS  950
Duane Clowater, Director - Projects Group, New Brunswick Department of Transportation & Infrastructure

PEDESTRIAN SAFETY CAMPAIGN  956
Nelson Costa, Manager, Traffic Safety, Regional Municipality of York

DEVELOPMENT OF A TRAFFIC SAFETY ACTION PLAN FOR THE CITY OF SASKATOON  970
Mariniel Flores, Graduate Research Assistant, Department of Civil and Geological Engineering, University of Saskatchewan; Peter Park; Angela Gardiner; Justine Nyen

THE CITY OF SURREY’S “P3 APPROACH” TO MUNICIPAL ROAD SAFETY PLANNING  990
Raheem Dilgir, President, TranSafe Consulting Ltd.; Jaime Boan

LOCAL ROAD SAFETY PLANS: GUIDELINES AND BEST PRACTICES  998
Jeffrey Bagdade, Partner, Opus International Consultants Inc.; Andrew Cetfetz

LONDON, ONTARIO STRATEGIC ROAD SAFETY STRATEGY  1009
Hart Solomon, Senior Engineer, Transportation, CIMA+; Maged Elmadhoon; Edward Soldo; Jaime Garcia; Ali Hadayeghi
IMPROVING TRANSPORTATION SAFETY: CALGARY SAFER MOBILITY PLAN 2013-2017 CASE STUDY  1028
Alfred Guebert, Senior Transportation Engineer, Next Generations Operations Centre, City of Calgary; Joanna Domarad

PARTNERSHIPS IN QUÉBEC: FOR BETTER MUNICIPAL ROAD SAFETY  1050
Catherine Berthod, Engineer and Urban Planner, ministère des Transports du Québec; Carol Leclerc

THE ‘AUTONOMES’ ARE COMING - THIS WILL FUNDAMENTALLY CHANGE HOW WE ‘DO’ ROAD TRANSPORTATION  1082
Paul Godsmark, Transportation Specialist, Independent Consultant; Bill Kenny

ADAPTIVE TRAFFIC SIGNAL CONTROL PILOT PROJECT FOR THE CITY OF SURREY  1104
Perry Craig, Senior Principal, Delcan Corporation; Sinisa Petrovic; Joseph Lam

TRAFFIC OPERATION IMPROVEMENTS AT THE PEMBINA-EMERSON PORT OF ENTRY  1126
Brant Magnusson, Traffic Operations Engineer, Manitoba Infrastructure and Transportation; David Lettner; Derek Durant

TRANSIT SIGNAL PRIORITY IMPACT ANALYSIS AND EVALUATION IN THE CITY OF EDMONTON  1146
Tony Qiu, Assistant Professor, University of Alberta; Xu Han; Pengfei (Taylor) Li; Amy Kim

CALGARY’S TRAVELLER INFORMATION SYSTEM  1163
Michael Gray, Advanced Traffic Management System Engineer, City of Calgary

A MONITORING STRATEGY FOR ACTIVE TRANSPORTATION PILOT PROJECTS  1182
Amy Ibrahim, Design and Contract Standards Engineer, Ontario Ministry of Transportation, Provincial Highway Management Division; Ray Bacquie

CONSIDERATIONS FOR ASSESSING THE ROAD SAFETY IMPACT OF DIGITAL AND PROJECTED ADVERTISING DISPLAYS IN CANADA  1192
Garreth Rempel, Principal, MORR Transportation Consulting Ltd.; Jeannette Montufar; Gerry Forbes; Robert Dewar
PEDESTRIAN SIGNAL HEAD WARRANT PROJECT  1210
Alfred Guebert, President, AAGuebert & Associates; Irini Akhnoukh

COQUITLAM CROSS-TOWN BIKE ROUTE - IMPROVING BICYCLE FACILITIES IN A MATURE SUBURBAN ENVIRONMENT  1227
Sarah Rocchi, Vice-President, Projects, Opus International Consultants; Catherine Mohoruk

DIAGNOSIS OF SAFETY PROBLEMS USING SAFETY ANALYST FOR EFFICIENT AND EFFECTIVE SAFETY MANAGEMENT  1236
Pedram Izadpanah, Senior Project Management, Transportation Engineering, CIMA+; Michael Pardo; Boyka Pachova; Susan Nichol; Ali Hadayeghi; Seetal Thukral

120 VOLT TRAFFIC SIGNAL SYSTEMS UTILIZING WIRELESS COMMUNICATION FOR TEMPORARY INSTALLATIONS  N/A
Lucien Gagnon, Manager, Traffic Signals & Navigational Aids, Manitoba Infrastructure and Transportation

ACTIVE “DO NOT BLOCK TRACKS” SIGN & QUEUE DETECTION SYSTEM  1260
Diana Emerson, Traffic Services Engineer, Manitoba Infrastructure and Transportation

ANALYSING AND MITIGATING QUEUES AT SIGNALIZED INTERSECTIONS ADJACENT TO RAILWAY CROSSINGS  N/A
Jeff Suggett, Senior Transportation Planner, Associated Engineering; Paul Nause

SAFETY REVIEW OF ALBERTAN REFUGE AREAS  1261
Jeremy Adamson, Infrastructure Management Systems Engineer, Alberta Transportation; Melodie Adamson

UNDERSTANDING THE EFFECTS OF MANDATORY BICYCLE HELMET LAWS ON HELMET USE, HEAD INJURIES AND RIDERSHIP: A SYSTEMATIC REVIEW  1262
Jacob Larsen, Senior Safety Research Advisor, Ontario Ministry of Transportation; Yoassry Elzohairy

DEVELOPMENT OF SCHOOL AREA TRAFFIC SAFETY GUIDELINES FOR MANITOBA  N/A
Jennifer Chapman, Traffic Analysis Engineer, Manitoba Infrastructure and Transportation; David Patman

PEDESTRIAN SAFETY IN ROUNDABOUTS  1263
John Hammer, Director, Transportation, Region of Waterloo; Nancy Button; Robert Henderson

POLICIES, GUIDELINES AND STANDARDS FOR TRAILS IN ALBERTA HIGHWAY RIGHTS-OF-WAY  1273
SAFE ROUTES TO SCHOOL: PROVIDING BETTER AND SAFER TRANSPORTATION CHOICES FOR STUDENTS 1294
Brian Patterson, Principal and Active Transportation Planner, Urban Systems Ltd; Erin MacGregor; Tegan Smith

SCHOOL TRANSPORT WALKING HAZARD ASSESSMENT GUIDELINES 1313
Jennifer Armstrong, Senior Transportation Planner, Morrison Hershfield; Zibby Petch

FIELD & LABORATORY CHARACTERIZATION OF TIRE DERIVED AGGREGATE IN ALBERTA 1335
Alireza Bayat, Assistant Professor, University of Alberta; Daniel Meles; Roger Skirrow

INNOVATIVE APPROACH TO ESTABLISH TRANSITIONS BETWEEN TWO MATERIALS OF DIFFERENT FROST SUSCEPTIBILITIES UNDER RIGID CONCRETE PAVEMENT AT MONTRÉAL-PIERRE ELLIOTT TRUDEAU INTERNATIONAL AIRPORT 1354
Louis D’Amours, Vice-President, Business Development, Groupe Qualitas Inc.; André Contant; François Chevalier

MONITORING THE THERMAL AND MECHANICAL BEHAVIOURS OF PUVRNITUQ AIRSTRIPI, NUNAVIK, NORTHERN QUEBEC 1364
Felix Gravel Gaumond, M.Sc. Student, Laval University; Guy Doré; Chantal Lemieux; Anick Guimond

INVESTIGATION METHODOLOGIES AND DESIGN FOR RUNWAY PAVEMENT REHABILITATION AT CHURCHILL FALLS AIRPORT 1381
Ludomir Uzarowski, Principal, Golder Associates Ltd.; Rabiah Rizvi; Michael Maher; Thomas Krzewinski

A NOVEL MODEL TO PREDICT THE CORROSION OF MECHANICALLY STABILIZED EARTH STRUCTURES 1394
Victor Padila, PhD Candidate, University of British Columbia; Pouria Ghods; Akram Alfantazi

RECYCLED CONCRETE AGGREGATE IN CONCRETE PAVEMENTS: A FIVE YEAR STUDY ON ITS EFFECT ON PAVEMENT PERFORMANCE 1414
Aleks Kivi; MASc Candidate, Engineer in Training, University of Waterloo; Federico Irali; Susan Tighe; James Smith; Cesare Sangiorgi

INTEGRATED ROAD RESEARCH FACILITY (IRRF): AN ALBERTA RESEARCH INITIATIVE 1431
Alireza Bayat, Assistant Professor, University of Alberta; Somayeh Nassiri; Roger Skirrow
MODELING ANALYSIS OF B-TRAIN TRUCKS ON SASKATCHEWAN PAVEMENT STRUCTURES 1449
Roberto Soares, Senior Project Engineer, PSI Technologies Inc.; Rielle Haichert; Curtis Berthelot; Ania Anthony; Jeff Kusalik

UNMANNED AIRCRAFT SYSTEMS 1461
Vern Fridfinnson, Geomatics Research and Development Technologist, Manitoba Infrastructure and Transportation

VERIFICATION OF PERVIOUS CONCRETE DRAINAGE CHARACTERISTICS USING INSTRUMENTATION 1474
Vimy Henderson, Pavement and Materials Engineering, Golder Associates Ltd.; Susan Tighe

MODELING THE IN SITU PERFORMANCE OF CULVERT JOINTS IN A PAVEMENT STRUCTURE 1494
Roberto Soares, Senior Project Engineer, PSI Technologies Inc.; Farukh Sharipov; Colin Wandzura; Brent Marjerison; Curtis Berthelot

SEISMIC REHABILITATION OF REINFORCED CONCRETE BRIDGE SUBSTRUCTURE USING FIBRE-REINFORCED POLYMER COMPOSITES 1496
Gaetano Bologna, Project Engineer, Fyfe Company; Jeewan Khabra; Mingyu Li

ORTHOTROPIC DECK WEAR SURFACE SYSTEM SELECTION – LIONS GATE BRIDGE NORTH APPROACH VIADUCT 1497
John Laxdal, Senior Associate Engineer, AMEC Environment & Infrastructure

BUILDING BRIDGES - FASTER, BETTER, SAFER UNDER EMERGENCY CONDITIONS 1510
Muhammad Suleman, Project Engineer, Ministry of Highways & Public Works, Government of Yukon; Amin Abdullah

DISRAELI BRIDGES PROJECT 1522
Emile Shehata, Lead Bridge Engineer, Tetra Tech WEI Inc.; Rick Haldane-Wilsone; Monique Buckburger; Brad Neirinck

INNOVATIVE OVERLOAD PERMITTING IN MANITOBA - ALLOWING A 363,500 KG (GVW) “SUPERLOAD” 1533
Geoffrey Oramasionwu, Senior Rating Engineer, Manitoba Infrastructure and Transportation, Government of Manitoba; Marta Flores-Barrios; Ryan Sanders

HIGHWAY 99 SHOULDER BUS LANE AT BNR OVERHEAD: COMPLEX FAST-TRACKED BRIDGE WIDENING AND SEISMIC RETROFIT TO PROVIDE STREAMLINED AND SUSTAINABLE COMMUTER OPTION 1552
Jianping Jiang, Vice-President, MMM Group Limited; Henry Leung; Jan Kocaba; Caroline Ngan
CALGARY AIRPORT TRAIL TUNNEL  1565
Azita Azarnejad, Bridge Operations Leader, CH2M HILL Canada Limited; Andrew Boucher; Joost Bolderheij

DESIGN AND CONSTRUCTION OF LOOKING BACK CREEK BRIDGE    1582
Mike Lau, Partner, Dillon Consulting Limited; Faria Khalil; Brian Beyak

OSBORNE STREET BRIDGE REHABILITATION AND WIDENING   1598
Vaibhav Banthia, Senior Structural Engineer, Tetra Tech WEI Inc.; Darren Burmey, Bridge Projects Engineer, City of Winnipeg, Susan Freig, Owner and Managing Consultant, Freig & Associates, Community Planning and Public Consultation; Matt Chislett; Rick Haldane-Wilsone; Kimberly Yathon

DESIGN AND CONSTRUCTION OF ACROW PANEL BRIDGES IN NORTHERN MANITOBA   1610
Graeme Loeppky, Associate, Dillon Consulting Limited

ADVANTAGES OF INCORPORATING FIBER REINFORCED POLYMERS INTO EARTHQUAKE SAFETY PROGRAM FOR THE BAY AREA RAPID TRANSIT (BART)   1630
Gaetano Bologna, Manager, Transportation Division, Fyfe Company; Scott Arnold

TOWN OF SOURIS SWINGING BRIDGE   1639
Kevin Amy, Bridge Project Manager, Stantec Consulting Ltd.; Gerd Birkle

INVESTIGATION AND REPAIR OF THE DIEFENBAKER BRIDGE FRACTURE   1650
Reed Ellis, Vice-President, Stantec Consulting Ltd.; Robert Connor; Manoj Medhekar; David MacLaggan; Matt Bialowas

EARLY-AGE CRACKING IN BRIDGE DECK SLABS REINFORCED WITH GFRP BARS   1667
Amir Ghatefar, PhD Candidate, University of Manitoba; Ehab El-Salakawy

NEW MSE RETAINING WALL TECHNOLOGY FOR HIGHWAY AND BRIDGE CONSTRUCTION “THE GRID STRIP” TO EASILY RESOLVE ENCROACHMENT ISSUES WITH BRIDGE PILES AND MANHOLES   N/A
Derek Essery, Technical Director of Engineered Products, Atlantic Industries Ltd. (AIL)

POST-TENSIONING CORROSION EVALUATION AND MITIGATION   N/A
Liao Haixue, NACE Cathodic Protection Specialist, Vector Corrosion Technologies; David Whitmore

WEST LRT PROJECT: ENABLING MOBILITY AND TRANSIT-ORIENTED DEVELOPMENT   1668
Ethan Askey, Manager, Sustainability Strategy, Transportation, City of Calgary
COUNTY-WIDE ACTIVE TRANSPORTATION SYSTEM (CWATS)  1680
Jane Mustac, Manager, Transportation Planning, County of Essex

STEPPING IT UP (METROLINX – PROJECT LEAD AND PARTNERS: CITY OF HAMILTON, REGION OF PEEL, GREEN COMMUNITIES CANADA AND UNIVERSITY OF TORONTO)  1692
Jennifer Lay, Program Advisor – School Travel, Metrolinx

TORONTO WALKING STRATEGY  1704
Stephen Buckley, General Manager, Transportation Services, City of Toronto

CITY OF VANCOUVER: TRANSPORTATION 2040  1716
Winston Chou, Senior Transportation Engineer, Traffic & Data Management Branch, City of Vancouver

DEVELOPMENT OF A STRATEGIC GOODS MOVEMENT NETWORK IN PEEL REGION  1725
David Kriger, Principal, David Kriger Consultants Inc.; Hillary Calavitta; Gary Kocialek; Sabbir Saiyed; Peter Plumeau; Daniel Murray

KEY FINDINGS AND CONCLUSIONS FROM THE STUDY: ACCOMMODATING OVERSIZE/OVERWEIGHT VEHICLES AT ROUNDABOUTS  1743
Eugene Russell Sr., Professor Emeritus, Department of Civil Engineering, Kansas State University; Dean Landman; Ranjit Prasad Godavarthy

EDMONTON URBAN ROADSIDE TRUCK SURVEY: PLANNING AND OPERATIONS  1759
Andrew Anderson, Policy Implementation and Evaluation Engineer, City of Edmonton; Howaida Hassan

A COMPARISON OF FIVE GREEN TRUCKING PROGRAMS ACROSS CANADA  1779
Paul Larson, CN Professor of SCM, University of Manitoba; Jairo Viafara

MULTIMODAL ANALYSIS OF FREIGHT TRANSPORT ACTIVITY AND INFRASTRUCTURE IMPACTS RELATED TO MANITOBA’S ENERGY SECTOR  N/A
Jonathan Regehr, Assistant Professor, University of Manitoba; Mark Reimer

SAFE AND SECURE TRANSPORTATION OF CANADA’S USED NUCLEAR FUEL  N/A
Elena Mantagaris, Director, Government and External Relations, Nuclear Waste Management Organization; Chris Hatton