**Presentations Start at 8:30 AM**

### Morning Presentations:
- Thunder Bay Hydro Power.House Project, Andy Armitage, Manager, Customer Service and Billing, Thunder Bay Hydro
- Pan-Canadian Electric Transit Systems: energy consumption, GHG reductions, opportunities and challenges ahead, Dr. Josipa Petrunic, Executive Director and CEO of CUTRIC (Canadian Urban Transit Research and Innovation Consortium)
- An Artificial Intelligence (AI) application in Engineering, Dr. Yolibeth Mejias, Sr. Project Engineer at the Ontario Ministry of Transportation
- EA in Ontario: The Times they are a Changing, Anneliese Grieve, Principal at Anneliese Grieve Strategic Environmental Planning Solutions
- Energy absorption features on the redesigned Bombardier BiLevel™ Commuter railcar, Philippe Hamel, P.Eng., Engineering Manager, Bombardier
- Sewer Pipe Inspection Using Innovative Techniques, Dr. A. Azimi, P.Eng, Department of Civil Engineering, Lakehead University

### Luncheon Presentation:
- PEO Discipline and Enforcement Process, Mike Wesa, P.Eng, Senior Northern Region Councillor

### Keynote Address:
- Designing Tomorrow's Transportation System in an Ever Changing Environment, Brian Hollingworth, P.Eng, Director and Sr. Practice Lead, Transportation Planning at IBI Group

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**Note:** Where available, presentations will be uploaded to the chapter website following the conference.
Ballroom 1
8:30 a.m.  Energy Absorption Features on the Redesigned Bombardier BiLevel™ Commuter Railcar
Speaker:  Philippe Hamel, P. Eng., MBA, Engineering Manager, Bombardier

Bombardier Transportation has redesigned its BiLevel™ commuter railcar to include Crash Energy Management (CEM) features. This complete redesign includes energy absorbing systems embedded in a specially designed structure. They allow a train to decelerate from 40 km/h to 0 without permanent deformation outside of the crumpling zones. There are numerous challenges to this design, including structural, ergonomic, dynamic, volumetric and regulatory issues. This presentation will review railcar collision safety principles and its evolution, will illustrate how crash energy management is integrated in various areas of the railcar and will focus on the energy absorption features. It will also review how these features operate, will describe how the design team solved the integration challenges and will conclude with a review of the life-size tests that verified functionality.

Viking Room
8:30 a.m.  Paper Presentation: An Artificial Intelligence (AI) application in Engineering - Application of Image analysis techniques to develop a quality control (QC) tool for automated optimum binder content (OBC) determination of Open-graded friction Course (OGFC) mixtures
Speaker:  Dr. Yolibeth Mejias, P. Eng., Sr. Project Engineer at the Ontario Ministry of Transportation

In some transportation agencies including the Florida Department of Transportation (FDOT), open-graded friction course (OGFC) mixtures are designed by estimating the optimum binder content (OBC) based on visual inspection of the asphalt binder draindown (ABD) configuration of three OGFC samples placed on pie plates with pre-determined trial asphalt binder contents (AC). The inspection of the ABD configuration is performed by trained and experienced technicians who determine the OBC using perceptive interpolation or extrapolation based on the known AC values of the above samples. In order to eliminate the human subjectivity involved in this method, the authors first developed an automated image processing-based methodology, an Artificial Intelligence (AI) application for prediction of the OBC using digital images of the pie plate specimens (PPS). In the extended research effort reported in this paper, a quality control tool (QCT) was developed for the aforementioned automated method (AI) to enhance its reliability when implemented by other agencies and contractors. QCT is developed using three quality control imaging parameters (QCIP), orientation, spatial distribution, and segregation of ABD configuration of PPS images. Then, the above QCIP were evaluated from PPS images of a variety of mixture designs produced using the FDOT visual method. The statistical and
computer-generated, results indicated that the selected QCIP are adequate for the formulation of quality control criteria for PPS production. The authors believe that the developed QCT will enhance the reliability and accuracy of the automated OBC estimation image processing-based methodology.

9:15 to 9:45 a.m. – REFRESHMENT / NETWORKING BREAK

**Ballroom 1**

9:45 am  
**EA in Ontario: The Times they are a Changing**

**Speaker:** Anneliese Grieve, Principal at Anneliese Grieve Strategic Environmental Planning Solutions

EA in Ontario is undergoing change largely as a result of pressures and challenges beyond the legislation. What do you need to be aware of and how to you manage those changes? This presentation will touch on changes and challenges with respect to regional and strategic EA, stakeholder engagement, Indigenous Community consultation and going beyond Class EAs.

**Viking Room**

9:45 a.m.  
**Sewer Pipe Inspection Using Innovative Techniques**

**Speaker:** Dr. A. Azimi, P.Eng, Department of Civil Engineering, Lakehead University

Conventional inspection techniques have been employed to detect tightness defects, cracks and partial pipe damages such as closed circuit television. The conventional inspection and monitoring techniques are very labor intensive and can be only implemented by trained operators. These factors significantly increase the operational cost of the condition assessment of wastewater collection systems. The temperature of residential wastewater in sewer pipelines ranging from 18 to 25 degrees whereas the infiltrated water due to snowmelt ranging from 0 to 5 degrees. Considering the large temperature difference between the wastewater and the infiltrated underground water, thermal probes with suitable sensitivity and accuracy will be able to detect the locations of cracks and potential pipe damages. In this presentation, results of preliminary experiments are shown to evaluate the performance of thermal probes and infrared cameras to show the proof of concept for wireless monitoring of sewer pipeline detection. In addition, sensitivity of infrared cameras to detect temperature and its accuracy to show the magnitude of the infiltrated flow will be examined.

10:30 to 11:00 a.m. – REFRESHMENT/ NETWORKING BREAK

**Ballroom 1**

11:00 a.m.  
**Thunder Bay Hydro Power.House Project**

**Speaker:** Andy Armitage, Manager, Customer Service and Billing, Thunder Bay Hydro

Thunder Bay Hydro is taking on the future of electricity distribution, working local homeowners to generate their own clean energy and serve as a power source to support the electricity grid. The presentation will include an overview of the PowerHouse system, an outline of the current project, and some live views of the system. The current project involves integrating the PowerHouse system into their SCADA system to demonstrate real world transmission savings.
The Canadian Urban Transit Research & Innovation Consortium (CUTRIC) has been leading the development of a Pan-Canadian Electric Bus Demonstration & Integration Trial, including 20 electric buses and 7 overhead charging systems distributed across three transit agencies (Translink, Brampton and York Region). Energy consumption modelling work has demonstrated the degree to which transit agencies need to plan for an energy overhaul of their fleet networks in order to enable standardized on-route and end-point charging opportunities integrated with energy storage devices in the future. This integration will overcome challenges associated with demand charges, when transit fleets seek to electrify their systems en masse.

**Ballroom 2 and 3**

12:00 p.m.  Buffet Lunch  
12:45 p.m.  Speaker Introductions  
12:48 p.m.  Luncheon Speakers: PEO Items – Mike Wesa, P.Eng. Senior Northern Regional Councillor, PEO Discipline and Enforcement Process  
1:00 p.m.  Regional Bridge Building Competition  
1:05 p.m.  Certificate Presentations  
1:15 p.m.  Scholarship Presentations  
1:30 p.m.  **Keynote Presentation:** Designing Tomorrow’s Transportation System in an Ever Changing Environment  

**Speaker:** Brian Hollingworth, P.Eng, Director and Sr. Practice Lead, Transportation Planning at IBI Group  

Increasingly Engineers are tasked with planning and designing transportation systems to meet the expectations and needs of a wide variety of users – pedestrians, cyclists, transit users, trucks and car drivers. While the opportunities and benefits of more “complete” transportation systems are significant, it can often be a challenge to come up with the right solutions that meet high public expectations, are in conformance with prevailing design standards and can be accomplished within reasonable budgetary and timeline expectations. This presentation will explore some recent policy, planning and design trends that can help facilitate multi-modal transportation. Strategies and actions from Thunder Bay’s soon to be completed Transportation Master Plan will be used to highlight areas of high potential in medium sized cities and northern environments.

2:30 p.m.  Draw for Door Prizes and Adjournment  

*NOTE: Delegates must be in attendance to claim a prize*