

# URBAN UPDATE

**Nadine Ibrahim** | [nadine.ibrahim@uwaterloo.ca](mailto:nadine.ibrahim@uwaterloo.ca) | **Twitter: @NadineIbrahim**

## Urban Projects

Attended Aida Mollaie's committee meeting on Dec 3 for an update on the Weight of Cities. Attended Donghui Lu's PhD defence on Dec 11 as an Internal Examiner.

## Engineering Education

CEEA-ACEG 2020 abstracts submitted on Dec 16 for the following papers: 1) Open Educational Resources in Undergraduate Engineering Education: Opportunities and Challenges; 2) Urban Design Days: Promoting Interdisciplinary Design and Communication Through Experiential Learning; 3) The Engineer of 2050: Thematic Analysis of CEEA-ACEG Workshop Responses and Reflections; and 4) Global Engineering: A Survey of Initiatives in Canadian Universities.

## Teaching

TAs/CAs for CIVE332/ENVE335 are all lined up. Also teaching CIVE401. Looking forward to Winter 2020.



## Urban Design Days Planning

With a very passionate team of students, Sara Al-Humidi, Sina Golchi, and Tarek Mostafa, we spent the fall term meeting every Thursday to plan out Urban Design Days, and figuring out exactly what the activity will be for the civil and environmental engineering students in CIVE332 Civil Engineering Systems and Project Management and ENVE335 Decision-Making for Environmental Engineers, and the planning students in PLAN 478 Transit Planning and Operations. While Sara focused on team formation leveraging her course on Making Collaboration Work, Sina focused on the maps using his ESRI GIS expertise, and Kareem focused on the project activities and the materials and supplies to make it happen.



## Event Highlights



**MTE Pitch Competition.** Judging the ENVE/GEOE capstone presentations with MTE engineers and Rebecca Saari. Dec 4.

**New Faculty Orientation for Lecturers.** Led by Interim Dean Rick Culham at the University Club. Dec 9.

**CEE Department Christmas Party.** At Graffiti Market. Dec 13.

**CBC The House with Chris Hall.** Interviewed by Chris Hall on The House on high speed rail and the hyperloop at CBC. Dec 18.

## Keep an eye out next month for...

Here are events to look forward to in January 2020:

- First day of classes, Jan 6
- Douglas Wright Engineer-in-Residence Meet and Greet, Jan 9
- Leadership workshop for graduate students by The Change Incubator, Jan 15
- Turkstra Talks, Jan 16
- Game of Floods for engineering students, Jan 21



**ACADEMICS  
WITHOUT  
BORDERS  
MEMBER**



**PEO 30 BY 30  
UNIVERSITY GROUP  
ACTION PLANNING  
SESSION**



**CBC: THE HOUSE  
BY CHRIS HALL  
INTERVIEWEE ON  
THE HOUSE**



## One Year at the University of Waterloo

As 2019 comes to a close, I take the chance to reflect on the activities of the year which is very special to me because this marks one year at the University of Waterloo, a place I now call my second home given how many hours I spend here. It's been a very productive year and a truly impactful experience taking the lead on Urban Engineering. Thanks to a very supportive Turkstra Chair Advisory Board, and a very collegial department, including faculty members that have become friends, and support staff that make it all happen. I am very grateful for having Carl Haas as my mentor throughout the year, and the excitement with which he shares his thoughts on the ideas we discuss together.

**"In other words, it will take cathedral thinking. I ask you to please wake up and make changes required possible" - Greta Thunberg**

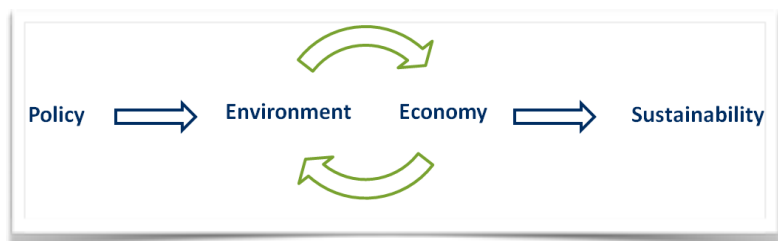
## Faculty Contribution



**Rebecca Saari** is an Assistant Professor in the Department of Civil and Environmental Engineering at the University of Waterloo. Dr. Saari studies the consequences of climate change and climate policy on human health and environmental inequality. Her post-graduate experience includes air pollution and air quality modelling at the University of Toronto, AECOM, Environment and Climate Change Canada, and MIT. As a professional air quality engineer in Ontario, she completed projects in seven Canadian provinces and territories. Dr. Saari has employed economic models, emissions models, atmospheric chemical transport models, and health response models to assess the costs and co-benefits of climate policy, energy policy, and transportation policy. She has been invited to speak at Harvard University, the University of Toronto, Carleton University, North Carolina State University, and the University of Washington. Her work has been published in Nature Climate Change, and covered in over 16 news outlets including CBC, NBC, and the New York Times.

Rebecca Saari’s work focuses on understanding the human sources and human impacts of harmful atmospheric emissions by building models to inform sustainable engineering and sustainable decisions. We seek to quantify the linkages between air quality, energy, climate, and equity. Her research group explores the air quality co-benefits of climate policy, and the multi-pollutant impacts of sustainable infrastructure. Making sustainable decisions means balancing multiple goals: a strong economy, a clean environment, an equitable society. Policies that focus on one goal, e.g., climate change policy, can lead to big wins or regrettable losses for our other goals if we are not careful in our policy assessment process. Integrated assessment frameworks combining models of the economy and earth system have the power to make such synergies and trade-offs stark and concrete. Saari Lab applies this powerful sustainability assessment tool to a key question: can air quality co-benefits justify climate policy? There are increasing calls to consider the ancillary benefits for air pollution of climate policy - the benefits of reduced pollution are local, immediate, and affect human health. However, significant climate or energy policies can affect the economy and the multitude of air pollution sources in complex ways. Can we better understand these linkages to make more informed, robust decisions?

She has directly informed policy through invited presentations to state-level policymakers and the U.S. EPA Climate Change Division, and she was cited in an amicus brief submitted by leading climate scientists to the D.C. Circuit Court evaluation of the U.S. Clean Power Plan - the Obama Administration's centrepiece climate policy.



## Student Contribution



**Kareem Mostafa** is a Ph.D. candidate in the Department of Civil and Environmental Engineering of the University of Waterloo under the supervision of Professor Tarek Hegazy. He obtained his Bachelor in Construction Engineering from the American University in Cairo in 2016. Then, he obtained his MASc in the field of construction engineering and project management from the University of Texas at Austin in 2018 before moving to Canada to start his Ph.D. His Ph.D. research aims to improve asset management and rehabilitation by using automation to resolve the current drawbacks existing in asset inspection methodologies as well as developing enhanced scheduling computation and visualization methods to be more suitable for scheduling the required maintenance and rehabilitation works.

Smart cities are on the rise as the answer to challenges of increasing population and limited resources. While physical infrastructure (e.g. bridges, schools, hospitals, etc.) are essential for the success of a city, the existing smart city models address physical infrastructure from the point of view of building new smart infrastructure from the ground up as opposed to maintaining and upgrading the existing assets. The current methods of asset management and inspection are time consuming and erroneous which have led to catastrophic events. Errors in inspections have caused the Oroville dam spillway to fail in 2017 forcing around 200,000 Californians to lose their houses, while problems with the delivery of the required rehabilitation work have caused the Morandi bridge in Italy to collapse killing 43 people. Therefore, Kareem and his research group aim to introduce the concept of “*Smart Rehabilitation*” that answers the question “*how to care for the currently aging infrastructure assets in a smarter framework?*” To achieve this goal, Kareem aims to tackle two important phases in the asset management framework; inspection and delivery. To improve inspection, Kareem aims to use deep learning and computer vision techniques to automate the detection, classification, and quantification of defects in assets based on collected images as well as estimate time and cost for the required maintenance. To improve the delivery phase, Kareem is developing new computation and visualization algorithms that tackle advanced repetitive scheduling problems with the aim to apply those scheduling techniques to the scheduling and delivery of the required rehabilitation work.

