

INTERNATIONAL CONFERENCE ON Transportation and Development 2019

Smarter and
Safer Mobility
and Cities

Papers from Sessions of the International Conference
on Transportation and Development 2019

Alexandria, Virginia | June 9–12, 2019

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TRANSPORTATION
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INSTITUTE

INTERNATIONAL CONFERENCE ON TRANSPORTATION AND DEVELOPMENT 2019

SMARTER AND SAFER MOBILITY AND CITIES

SELECTED PAPERS FROM THE INTERNATIONAL CONFERENCE ON
TRANSPORTATION AND DEVELOPMENT 2019

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Alexandria, Virginia

SPONSORED BY
The Transportation & Development Institute
of the American Society of Civil Engineers

EDITED BY
David A. Noyce, Ph.D., P.E.



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Preface

It is my great pleasure to welcome you to the ASCE International Conference on Transportation and Development (ICTD 2019) organized by the Transportation and Development Institute (T&DI)! ICTD is ASCE's flagship conference in transportation and development. The conference theme, *Engineering Smart Mobility for the Smart City*, represents our vision for exploring how society will adapt to transportation engineering and development challenges facing the cities today and tomorrow. We hope you join your peers and other leading practitioners, planners, researchers, and policy makers as they discuss innovative and necessary solutions to these needs and how our cities must appropriately adapt over three days of activities, June 9 through June 12, 2019, at the Hilton Alexandria Mark Center in Alexandria, Virginia.

Alexandria is a vibrant city on the Potomac River, just south of Washington, DC. It's known for its Old Town, with brick sidewalks and well-preserved 18th- and 19th-century buildings. A quick metro, transit, or vehicle ride opens you to all the wonders of Washington, D.C. The D.C. metro area, and the planned conference tours, offers many unique real-world examples for transportation and development professionals to feel, think, and learn about smart mobility and smart cities.

ASCE ICTD 2019's three days of technical programs features five plenary sessions which includes national leaders from ASCE, T&DI, government agencies, and private industry discussing core conference themes:

- Imagining and creating our future world & Understanding and harnessing smart mobility and smart cities.
- Disruptive technologies: powerful enablers for policymakers and operating agencies.
- Smart cities, now!
- Smart mobility, now!
- Unmanned traffic management and the future of unmanned systems in urban space

You will also hear from the conference chair and co-chairs who have spent countless hours preparing and outstanding ICTD 2019.

The program also covers deeper technical content on multiple topics and modes in transportation and development through eight (8) concurrent tracks. In addition to the podium speakers, poster sessions will provide the opportunity for attendees to learn about cutting edge research in smart cities and smart mobility and have the opportunity to speak directly with the authors. The program also includes a variety of special events such as the Younger Members' sessions on "The Best Advice I Ever Received" and "3-Minute Pitch Competition, along with a wonderful icebreaker reception and T&DI's annual Awards Banquet.

On Sunday, June 9, the conference is preceded with seven (7) workshops on the following topics:

- Truck Platooning Impacts on Infrastructure, Energy, and Environment
- Ethical Challenges of Disruptive Technologies
- How 5G Will Transform Society and Enable Smart Cities
- University Transportation Centers' (UTC) Smart City Activities
- National Science Foundation (NSF) Research
- Security in 'Smart' Applications—How to Outsmart the Hackers
- Integrating Transportation with Land Use and Development

All these workshops are carefully designed to enhance the experience of participants and provide the opportunity to earn PDHs.

The conference concludes by providing two technical tours, one at FHWA's Turner-Fairbanks facility, and one at the Reagan National Airport.

Last but not the least, conference attendees get the opportunity to attend over 15 technical committee meetings of ASCE, covering all areas of transportation and development.

ASCE ICTD 2019 has followed the great success of ICTD 2018 and attracted significant interest indicated by the rich technical program. A total of 62 papers were accepted for publication in the proceedings. Please be aware that each paper went through a rigorous peer review by at least three technical experts and a quality assurance process before becoming a publication of ASCE – the world's largest publisher of Civil Engineering content. The proceedings for this conference have been organized into two (2) volumes based on the topical distribution as follows:

- Volume I: Transportation & Development 2019 – Smarter and Safer Mobility and Cities
- Volume II: Transportation & Development 2019 – Innovation and Sustainability in Smart Mobility and Smart Cities

All these accomplishments are due to the incredible efforts of the ICTD 2019 Conference Chair, Walter Kulyk, Conference Co-Chair, Eva Lerner-Lam, the Conference Steering Committee, and the terrific support from ASCE T&DI staff. I would also like to express my sincere gratitude to all the authors and conference participants for their contributions. I am grateful to all paper reviewers for their outstanding volunteer efforts. Finally, special thanks goes to the entire Conference Steering Committee, T&DI technical committee volunteers, ASCE T&DI staff members, sponsors, exhibitors, invited speakers, and session chairs for their hard work and great efforts to help lead the development of ASCE ICTD 2019!

Our unique integration of private, government, and academic leaders makes the ASCE ICTD event series an excellent platform for information exchange, experience sharing, and professional networking. I hope ASCE ICTD 2019 will be another wonderful and rewarding experience, and I sincerely hope that ASCE ICTD becomes a 'can't miss' conference in each year that follows. On behalf of the conference leadership, organizing committee, and ASCE T&DI, I wish you a very pleasant stay in Alexandria!

ASCE ICTD 2019 Co-Chair & Proceedings Editor



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