

International Conference on Transportation and Development 2016

PROJECTS AND PRACTICES FOR PROSPERITY



Proceedings of the 2016
International Conference on
Transportation and Development

Houston, Texas
June 26–29, 2016



Edited by
Kelvin C. P. Wang, Ph.D., P.E.



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PROJECTS AND PRACTICES FOR PROSPERITY

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TRANSPORTATION AND DEVELOPMENT

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

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Preface

With over 15,000 members the Transportation and Development Institute (T&DI) of the American Society of Civil Engineers (ASCE) is pleased to offer the proceedings of the International Conference on Transportation & Development held in Houston, Texas, USA (ICTD 2016) on June 26-29, 2016. There are over 100 papers in the proceedings covering topics on roadways, rail, airfields, development, and infrastructure.

The ICTD conference brings together transportation and development researchers, engineers, planners, designers, project managers, construction managers, and contractors from around the world to discuss advances in transportation and modes of travel as well as the interconnection with new developments such as airport cities, planned neighborhoods, and urban city centers.

The following five tracks are included at the conference along with the five Technical Track Chairs:

- | | |
|------------------------|---------------------|
| • Rail & Transit | Michael J. Loehr |
| • Development | Lenor M. Bromberg |
| • Roadways | Jeffrey D. Borowiec |
| • Aviation & Aerospace | Loy F. Warren III |
| • Cross-Cutting Themes | Zhanmin Zhang |

I would like to specifically thank the Technical Track Chairs who spent many hours, days and weekends reviewing papers, soliciting reviews, and contacting authors. Without their tireless work, we would not have this wonderful volume of high quality proceedings. I, together with the Track Chairs, thank all the reviewers and the T&DI committees who contributed to the proceedings' quality.

Andrea Baker, Senior Manager of T&DI, provided a tremendous amount of logistical support in the paper review process and advised the Technical Track Chairs and myself of new information and potential problems. Our T&DI Executive Director Muhammad Amer has been the backbone for the success of this conference. Susan Long (ASCE Conference) and Donna Dickert (ASCE Publications) supported the conference throughout different stages of the preparation.

Last but not least, the leadership of the two conference chairs, Mr. Geoff Baskir of the FAA and Professor Ernie Heymsfield of the University of Arkansas, is highly appreciated!

Kelvin C.P. Wang, Editor
Professor of Civil Engineering, and Gilbert, Cooper, W&W Steel Chair
Oklahoma State University

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