Transportation and Traffic Theory 2009: Golden Jubilee

William H. K. Lam · S. C. Wong · Hong K. Lo
Editors

Transportation and Traffic Theory 2009: Golden Jubilee

Papers selected for presentation at ISTTT18,
a peer reviewed series since 1959

Editors

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Preface

It is our great privilege and honor to present the proceedings of the 18th *International Symposium on Transportation and Traffic Theory* (ISTTT), held at The Hong Kong Polytechnic University in Hong Kong, China on 16-18 July 2009. The 18th ISTTT is jointly organized by the Hong Kong Society for Transportation Studies and Department of Civil and Structural Engineering of The Hong Kong Polytechnic University.

The ISTTT series is the main gathering for the world's transportation and traffic theorists, and those who are interested in contributing to or gaining a deep understanding of traffic and transportation phenomena in order to better plan, design and manage the transportation system. Although it embraces a wide range of topics, from traffic flow theories and demand modeling to road safety and logistics and supply chain modeling, the ISTTT is hallmarked by its intellectual innovation, research and development excellence in the treatment of real-world transportation and traffic problems. The ISTTT prides itself in the extremely high quality of its proceedings. Previous ISTTT conferences were held in Warren, Michigan (1959), London (1963), New York (1965), Karlsruhe (1968), Berkeley, California (1971), Sydney (1974), Kyoto (1977), Toronto (1981), Delft (1984), Cambridge, Massachusetts (1987), Yokohama (1990), Berkeley, California (1993), Lyon (1996), Jerusalem (1999), Adelaide (2002), College Park, Maryland (2005), and London (2007).

This 18th ISTTT celebrates the 50th Anniversary of this premier conference series. The first Symposium, organized by Professor Robert Herman, was held on 7-8 December 1959. A total of 15 papers were presented in the 1st Symposium. The scope of this Symposium series has since broadened, from the *Symposium on the Theory of Traffic Flow* to the *International Symposium on Transportation and Traffic Theory*. The ISTTT has also grown in size, but is still limited to around 35 papers. The rationale is, as was since the 1st Symposium, to allow ample time for presentation and informal discussion. Indeed, this time, in celebrating the 50th Anniversary of this tradition, we have arranged roundtable discussions to further enhance the interactions among researchers, scientists, and practitioners. We hope to have an opportunity to reminisce advances made in the past, and to outline important, uncharted territories. In reviewing the outline of the 1st Symposium, we were awed by the foresights of the researchers then, addressing research topics such as traffic control, distribution of traffic on a network and that of households and workplaces, clustering tendency of vehicular traffic, modeling traffic via stochastic processes, and simulation of bottlenecks, etc. These topics appear as fresh today as they were posed 50 years ago, despite much progress having been made. Transportation and traffic theories renew themselves as technology advances, as human activities are re-organized, and as scarce resources become gradually depleted, etc, representing our best effort at the time to understand and

hence manage the needs and consequences of connecting activities, goods, and people. From this vantage point, we are confident that the best years for ISTTT are yet to come in the future.

It is timely to organize the 18th ISTTT in Hong Kong, as the thrust of transportation infrastructure development has emerged strongly in Asia. Indeed, many parts of Asia are currently undertaking extensive transportation infrastructure programs. Hong Kong, for example, will initiate 10 major infrastructure projects with an investment of about HK\$250 billion (roughly US\$32 billion), in which 6 are transportation projects, including 4 railway and 2 highway infrastructure projects. These transportation infrastructures will bring about an economic benefit of more than HK\$100 billion (roughly US\$12 billion) annually, amounting to some 7% of the GDP of Hong Kong in 2006. This points to the imminent demand of high caliber transportation and traffic planners and engineers for the planning, design, management and operation of the transportation systems. The 18th ISTTT offers an excellent platform to elevate the role of transportation and traffic theories for transportation infrastructure planning and operations.

Special thanks are given to Members of the International Advisory Committee (IAC) and the local organizing committee for reviewing the extended abstracts and then full paper submissions, especially under the short review time requested of them. Our particular appreciation is extended to the referees who have contributed their considerable time and effort to the two-tier review process. With their dedicated support, each paper submission received at least three reviews, typically four to five, sometimes up to six reviews. Given the extremely high selectivity, we have tried our very best to ensure that each paper submission received a sufficient number of reviews to evaluate its merit. In reality, the tight constraint on the number of papers to be accepted for this Symposium have forced us to decline a number of very high quality submissions, which would be acceptable for publications in quality transportation journals. All in all, out of 230 extended abstract submissions, we have finally selected 35 papers to be included in this volume. We sincerely hope that this volume will serve as a vehicle to stimulate novel research initiatives in transportation and traffic theories.

As this volume was heading towards press, the news of Ryuichi Kitamura's untimely death on 19 February 2009 struck us with sadness and a profound sense of loss. A professor at Kyoto University, Ryuichi had given his unstinting support to ISTTT as a Member of the IAC. All of us who had the good fortune of having met him were often touched by his cheerfulness, kindness, and generosity. His positive attitude and warmth endured even when he was suffering from a long illness. We shall sorely miss his scholarship and friendship.

This commemorative Symposium volume is dedicated to researchers, scientists, and practitioners who have spent their career advancing the state-of-the-art in

transportation and traffic theories. We celebrate their accomplishments and honor the memory of those who are not with us today.

Finally, we express our gratitude to the organizations whose financial contribution has made it possible for us to host the 18th ISTTT in Hong Kong.

William H. K. Lam, S.C. Wong and Hong K. Lo

March 2009

Remembering Ryuichi Kitamura

On February 19, 2009, many of us were saddened to hear of Ryuichi Kitamura's passing. His close friends and colleagues had known for some time of his struggle with cancer, but had drawn hope from his appearances at conferences and occasional correspondence. He taught us a lot about how to be graceful in the face of adversity, as he remained his wonderful positive self until the end, and continued to write and conduct far-reaching research with his students and collaborators. He had hoped to attend the 18th ISTTT meeting in Hong Kong, but unfortunately it was not meant to be.

Ryuichi returned to Kyoto University, his alma mater, in 1993, as a Professor of Urban Management in the Faculty of Engineering, after a distinguished 15-year career on the faculty of the Department of Civil and Environmental Engineering at the University of California at Davis, where he was instrumental in founding the Institute for Transportation Studies (ITS). He received his BS in Civil Engineering and MS in Transportation in 1972 and 1974, respectively, from Kyoto University, and a PhD in Civil Engineering from the University of Michigan at Ann Arbor in 1978.

Through his research, teaching and professional service, Ryuichi played a key role in advancing the state of the art as well as state of practice in travel demand modeling and the dynamic analysis of transportation systems through micro-simulation of household travel and activity behaviour. He realized early on that travel demand does not occur for its own sake, but is part of a broader set of activities undertaken by individuals and households in fulfilling their various needs. He became a major force in the US and internationally in promoting greater behavioural realism in transportation models, leading the way towards comprehensive activity-based models of travel demand.

Ryuichi challenged conventional wisdom and brought a fresh perspective to nearly all topics on which he worked. He was a scholar, with a probing inquisitive mind, who subtly but firmly made you look at problems from a different angle. He was a keen observer of social trends, and among the first to recognize how they might impact travel and transportation. Telecommuting, changing gender roles, increased environmental awareness and shifting preferences are examples of phenomena he sought to understand and quantify in terms of transportation implications. Ryuichi was one of few researchers who had the methodological firepower to analyze these kinds of trends rigorously, ranging from novel survey methods to advanced econometric and psychometric techniques.

His quest for models based on sound behavioural theories was promoted through several disciples who studied under him at both Davis and Kyoto, and who went on to become influential scholars and practitioners in their own right. He helped

shape the field through his service as chair of the Traveller Behaviour and Values committee of the Transportation Research Board in the mid to late 1980's, a time of major advances in both research and practice. He served as President of the International Association of Travel Behaviour Research (IATBR) in 1992-94, and hosted its triennial meeting in Kyoto in 2006. In that same year, the IATBR recognized his contributions by awarding him the Lifetime Achievement Award.

Ryuichi was a member of the International Advisory Committee of the ISTTT, and had discussed with us his desire to host it in Kyoto at some future date. It is unfortunate he did not live to see this wish fulfilled. We will miss his thoughtful interventions and good humour, the depth of insight and breadth of perspective he brought to the ISTTT, and his warm, pleasant and congenial personality. I will miss a dear friend, who contributed so much to making what we do the exciting privilege it truly is.

Hani S. Mahmassani

March 2009

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The Croucher
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Founded in 1979 by the late Mr. Noel Croucher, one of the founders of the original Hong Kong Stock Exchange and who contributed to the development of Hong Kong for nearly seven decades, with the object to promote the standard of natural sciences, technology and medicine through education and research activities in Hong Kong. <http://www.croucher.org.hk/>

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FCLU (<http://www.polyu.edu.hk/fclu/>) is the biggest higher education provider of professional manpower for the Hong Kong construction industry. Virtually all aspects of construction from land surveying to transportation and infrastructure design, to actual construction and its management, to repair and refurbishment and to the operation and management of finished facilities are covered by the Faculty's programmes and its research activities.

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