Proceedings of
The 5th Japan-China Joint Seminar on City and ITS
Low-Carbon Urban Planning and Transportation Policies

August 23–24, 2009
Reception Hall (2F), Faculty Club, Hiroshima University (Higashi-Hiroshima Campus)
The photo on the cover page was provided by Hiroshima Electric Railway Co., Ltd.
Proceedings of
The 5th Japan-China Joint Seminar on City and ITS

Low-Carbon Urban Planning and Transportation Policies

Date August 23~24, 2009
Venue Reception Hall (2F), Faculty Club, Hiroshima University
(Higashi-Hiroshima Campus)

Organizers
Hiroshima International Center for Environmental Cooperation (HICEC)
Center of Asian Safe Mobility Research (ASMO), Hiroshima University

Co-organizers
Toyota Transportation Research Institute (TTRI), Graduate School for
International Development and Cooperation (IDEC), Hiroshima University

Sponsors
Electric Technology Research Found of Chugoku
Toyota Motor Corporation

Supported by
Japan Society for Civil Engineering (JSCE), Hiroshima University

Local Organizing Committee
Chair: Prof. Akimasa Fujiwara, Directors of HICEC and ASMO, Vice Dean of IDEC
Secretary General: Assoc. Prof. Junyi Zhang
Committee Members: Assoc. Prof. Makoto Tsukai, Assis. Prof. Hiroshi Shimamoto,
Assis. Prof. Masashi Kuwano, and Assis. Prof. S.B. Nugroho
PREFACE

With the rapid increase of population and the progress of motorization in Asian cities, urban and transportation issues, such as urban sprawl, environmental and energy issues, traffic accidents, and the declining mobility issues of low-income and disabled people, are becoming more and more serious. These issues should be properly resolved in order to realize sustainable Asian mobility society with a balanced consideration of efficiency, environment and energy, and social equity and so on. Especially, development trends in China, whose total CO$_2$ emissions are ranked in the second place in the world (but the level of emissions per capita is much lower), could have various influences on the sustainable development in Asia and the remaining part of the world. On the other hand, aiming to realize a low-carbon society, various countermeasures have been taken and promoted in Japan in recent years. Under such circumstances, the Japan-China Joint Seminar on City and ITS was first proposed and held by Nagoya University in 2005 when EXPO 2005 AICHI took place. Since then, the seminar has been regularly organized by turns by the researchers in both countries, as shown below.

The first seminar: *Urban Development and ITS for the Future of Asian Cities*  
Nagoya City, July 10-11, 2005, organized by Nagoya University

The second seminar: *Urban Development and ITS for the Future of Asian Cities*  
Harbin City, July 30-31, 2006, organized by Harbin Institute of Technology

The third seminar: *Transportation and Urban Planning*  
Kumamoto City, August 4-5, 2007, organized by Kumamoto University

The fourth seminar: *ITS for a Better Transportation Society*  
LangFang City, July 17-18, 2008, organized by Tsinghua University

It is expected that such academic exchange activities among researchers and practitioners in the field of urban and transportation in both countries could contribute to a better understanding of the urban and transportation issues, enhance research potentials and promote joint research, and consequently provide useful insights into policy decisions. In the fourth seminar, it was decided to hold the fifth seminar in Hiroshima. For this purpose, it is a great honor for Hiroshima International Center for Environmental Cooperation (HICEC: http://hicec.hiroshima-u.ac.jp/) and Center of Asian Safe Mobility Research (ASMO: http://www.hiroshima-u.ac.jp/aso/), Hiroshima University to organize the fifth seminar under the theme “Low-Carbon Urban Planning and Transportation Policies”. The co-organizers are Graduate School for International Development and Cooperation (IDEC), Hiroshima University, and Toyota Transportation Research Institute (TTRI).

This seminar is financially supported in part by Electric Technology Research Found of Chugoku and Toyota Motor Corporation. Japan Society for Civil Engineering (JSCE) also provides organizational supports.

The local organizing committee would like to express our sincere gratitude to all the above organizations for their kind supports.

Prof. Akimasa Fujiwara  
Chair of Local Organizing Committee  
Directors of HICEC and ASMO, Vice Dean of IDEC
LIST OF CONTRIBUTORS

Ryosuke ANDO  
Toyota Transportation Research Institute, JAPAN

Yasuo ASAKURA  
Kobe University, JAPAN

Xiqun CHEN  
Tsinghua University, CHINA

Akimasa FUJIWARA  
Hiroshima University, JAPAN

Mitsuhiro FUKUI  
Toyota Motor Corporation, JAPAN

Noboru HARATA  
The University of Tokyo, JAPAN

Yoshitsugu HAYASHI  
Nagoya University, JAPAN

Siji HU  
Beijing Jiaotong University, CHINA

Tomoyuki INAGAKI  
Toyota Transportation Research Institute, JAPAN

Xiushan JIANG  
Beijing Jiaotong University, CHINA

Fumitaka KURAUCHI  
Gifu University, JAPAN

Masashi KUWANO  
Hiroshima University, JAPAN

Taiyoung LEE  
Toyota Transportation Research Institute, JAPAN

Ruimin LI  
Tsinghua University, CHINA

Ling LIU  
Dalian Maritime University, CHINA

Huapu LU  
Tsinghua University, CHINA

Yasuhiro MIMURA  
Toyota Motor Corporation, JAPAN

Shoshi MIZOKAMI  
Kumamoto University, JAPAN

Yoshiki NAKAJIMA  
Kobe University, JAPAN

Sudarmanto Budi NUGROHO  
Hiroshima University, JAPAN

Runhua QIAN  
Tsinghua University, 
Tianjin Vehicle and Ship Institute, CHINA

ZhengJiang SHEN  
Kanazawa University, JAPAN

Hiroshi SHIMAMOTO  
Hiroshima University, JAPAN

Jing SHI  
Tsinghua University, CHINA

Qixin SHI  
Tsinghua University, CHINA

Kiyoshi TAKAMI  
The University of Tokyo, JAPAN

Makoto TSUKAI  
Hiroshima University, JAPAN

Zhongzhen YANG  
Dalian Maritime University, CHINA

Jiangqian YING  
Gifu University, JAPAN

Xinxin YU  
Tsinghua University, CHINA

Jianmin ZHANG  
Tianjin Vehicle and Ship Institute, CHINA

Junyi ZHANG  
Hiroshima University, JAPAN

Xiaoli ZHANG  
Tsinghua University, CHINA

Jia ZHAO  
Beijing Jiaotong University, CHINA

Xiaoqiang ZHANG  
Tsinghua University, CHINA

Wenqian ZOU  
Dalian Maritime University, CHINA
CONTENTS

PREFACE
LIST OF CONTRIBUTORS

Part One: Climate Change and Low-Carbon Society
Yoshitsugu Hayashi
What is wrong with transport as a contributor to climate change? 1
Noboru Harata and Kiyoshi Takami
Scenario analysis to low-carbon society: Commuting OD minimization and short car trip reduction 2
XiuShan Jiang, Jia Zhao and Siji Hu
Analysis of changes in energy consumption and main factors on a complete decomposition model 8
Sudarmanto Budi Nugroho, Akimasa Fujiwara and Junyi Zhang
Impact assessment of BRT implementation on ambient ozone concentration near TransJakarta corridors 17

Part Two: Smart Planning of Transportation Network
Shoshi Mizokami
A network reorganization planning method of urban bus systems 32
JiangQian Ying
A comparison of Japan and Britain’s railway systems 39
ZhongZhen Yang, WenQian Zou and Ling Liu
Study on the competition and marketing strategy of road-passenger-transport-based express in China 45
Yoshiki Nakajima and Yasuo Asakura
Empirical analysis of railway smart card data 57

Part Three: Safety and Security
XiaoQiang Zhao, RuiMin, Li and XinXin Yu
Incident duration model on urban freeway based on classification and regression tree 62
Ryosuke Ando, Tomoyuki Inagaki, Taiyoung Lee, Yasuhiro Mimura, and Mitsuhiro Fukui
System acceptability of DSSS (Driving Safety Support Systems) based on demonstration experiment in Toyota City 66
RunHua Qian, QiXin Shi, XiQun Chen and JianMin Zhang
Analysis of environmental security conditions for dangerous goods transportation by container 76
Jing Shi
Drivers’ route choice behavior on the provision of traffic information 84

Part Four: Innovative Methodology
HuaPu Lu and XiaoLi Zhang
Short-term traffic flow forecasting based on non-parametric regression and its application in Beijing 91
ZhengJiang Shen
Simulating spatial market share patterns for impacts analysis of large scale shopping center on downtown revitalization 110
Hiroshi Shimamoto and Fumitaka Kurauchi
A transit assignment model incorporating the correlation of vehicles’ arrival 122
Masashi Kuwano, Akimasa Fujiwara, Junyi Zhang, and Makoto Tsukai
A copula-based simultaneous-equation model of car ownership and usage behavior 139
PART ONE

CLIMATE CHANGE AND LOW-CARBON SOCIETY
PART TWO

SMART PLANNING OF

TRANSPORTATION NETWORK
PART THREE

SAFETY AND SECURITY
PART FOUR

INNOVATIVE METHODOLOGY
ELECTRIC TECHNOLOGY RESEARCH FOUNDATION OF CHUGOKU

Japan Society of Civil Engineers