

Application Form of EASTS IRG

Date of Submission: 2013/08/30

1. Name of IRG: Viability of Public Transport Harmonizing System with Para-Transit Modes
2. List of research members 1) a) Name of representative: Tetsuo YAI b) ID number of EASTS Regular Member: JP-95-13-0196 c) Affiliation: Department of Built Environment, Tokyo Institute of Technology d) E-mail: tyai[at]enveng.titech.ac.jp e) Country/Region & Address: Japan 2) a) Name of member: Kasem CHOOCHARUKUL b) ID number of EASTS Regular Member: th-95-13-0073 c) Affiliation: Department of Civil Engineering, Chulalongkorn University d) E-mail: kasem.c[at]eng.chula.ac.th e) Country/Region & Address: Thailand 3) a) Name of member: Van Hong TAN b) ID number of EASTS Regular Member: vn-11-13-0004 c) Affiliation: Highway Department, Technology University of HCM City d) E-mail: vantan10[at]yahoo.com e) Country/Region & Address: Vietnam 4) a) Name of member: Lim IV b) ID number of EASTS Regular Member: kh-09-13-0002 c) Affiliation: Ministry of Land Management, Urban Planning and Construction d) E-mail: limiv001[at]hotmail.com e) Country/Region & Address: Cambodia 5) a) Name of member: Karl B. VERGEL b) ID number of EASTS Regular Member: ph-00-13-0031 c) Affiliation: Department of Civil Engineering, University of the Philippines d) E-mail: <u>karlvergel[at]yahoo.com</u> e) Country/Region & Address: Philippines 6) a) Name of member: Yasunori MUROMACHI b) ID number of EASTS Regular Member: JP-95-13-0189 c) Affiliation: Department of Built Environment, Tokyo Institute of Technology d) E-mail: ymuro[at]enveng.titech.ac.jp e) Country/Region & Address: Japan 7) a) Name of member: Kiyohisa TERAJ b) ID number of EASTS Regular Member: JP-13-13-5186 (as Toshiba) c) Affiliation: International Research Center of Advanced Energy Systems for Sustainability, Tokyo Institute of Technology (dispatched from Toshiba Cooperation) d) E-mail: terai[at]ssr.titech.ac.jp e) Country/Region & Address: Japan

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4. Keywords (Maximum: 5 words)

Electric Vehicle, Light Rail Transit, Travel Demand Forecasting, Travel Behavior Analysis, Planning System and Theory

5. Purpose and Mission of IRG:

The mission of the IRG is to establish planning theory and demand-forecasting methodologies suitable for public transport system (particularly rail-based electric vehicle transport systems) that could harmonize with existing Para-transit modes that are unique and inevitably important in Asian cities. The implementation of rail-based transit systems has been broadly planned and discussed in many Asian cities and some of them were already being in service. However, the majority of such planning or implementation had been mainly devoted to the ones for mass rapid transit (MRT) in some large cities and there are little considerations on the planning issues of EV (electric vehicle) systems in middle or small sized cities in Eastern Asia. Since EV-based train and bus complementary integrated with Para-transit modes may have a large potential for energy or environmental efficiencies and also may contribute to the realization of smart cities, further implementation or consideration might be expected and recommended. Nevertheless of these large potentials, the planning procedure for such systems for Eastern Asian cities has not yet been fully studied. In addition, existing demand forecasting methodologies may not be suitable for planning of such new transport systems. This IRG aims at developing new ideas and methodologies for these issues specific to EV-based public transit systems in Eastern Asia.

For the issues on the development of planning theory, we consider the following specific research topics:

- Making a future vision after implementing EV-based public transport (e.g. Light Rail Transit, Bus) systems particularly in middle/small sized cities in Eastern Asia.
- Considering the possible solution of implementing public transport systems that might not be conflicted with existing transport mode such as Para-transit.
- Building the comprehensive framework for the planning of EV-based transit systems.
- Designing system-optimal electric energy saving system for the new transit systems.

For the issues on the development of travel demand forecasting, we consider the following specific research topics:

- Development of frequency-based transit assignment model suitable for passenger demand forecasting of EV-based public transit.
- Methodological development of optimizing the level-of-services of the new transit

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- systems by considering both efficiency and equity issues.
- Development of real-time operation management with streaming data for travel behavior and electric energy supply.
 - Development of new demand forecasting method considering endogenous taste/attitude change about environment.

6. Target year for completion (Research period is suitable within four years.):

October 2013 to September 2016

7. Research plan:

(October 2013 - September 2014)

- Review of best practices and studies about EV-based public transportation systems both in terms of planning process and travel behavior analysis (i.e. demand forecasting).
- Exploring the possible places for case studies and visiting the site for investigation.
- Setting up and finalizing research agenda and site for case studies.
- Conducting a seminar in Tokyo

(October 2014 - September 2015)

- Development and enhancement of planning theories.
- Development and enhancement of travel demand forecasting methods.
- Preparation for the papers submitted to EASTS 2015 Conference.

(October 2015 - September 2016)

- Conducting case studies
- Conducting a seminar or symposium
- Holding a special session at EASTS 2015 Conference.
- Summarizing the final report.

8. Expected research funds (ex. ICRA (Research grant of EASTS), etc.

Funding from Toshiba Cooperation for the collaborative research (2013-2016, already started).

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