Activity Report of IRG-18-2012

IRG Code **Name of IRG**	IRG-18-2012 (> M-IRG04-2012) **Strategies for a Sustainable Transportation Path for Small- and Medium-sized Cities in East Asia**
Status	Continuation
Representative Member	Dr. Alexis M. FILLONE, De La Salle University-Manila
Contact Person Email*	Prof. Dr. Atsushi FUKUDA, Nihon University fukuda.atsushi[at]nihon-u.ac.jp

1. Activity of IRG in 2013-2014

- Group members submitted papers related to our IRG in national and international conferences
- Currently has a web-based discussion forum and for research exchanges at https://app.box.com
- Continuously updating the group website http://amfillone.wix.com/aseanbrt to provide information about the ongoing research activities of the group members

2. Self-evaluation in 2013-2014

2.1 Achievement

・Paper (Title, Authors, Year, Name of the Journal, etc.)

・Report and book

- Currently developing the contents of the proposed book related to the IRG group research through brainstorming in time for the next EASTS conference in Cebu, Philippines

・Seminar, symposium and special session: (Title, Date, Venue & abstract)

1. *Introduction on BRT Developments in Medium Size Cities in Vietnam - Case Study of Danang* City by Nguyen Van Truong (University of Transport and Communcation)
   Abstract: Danang is the most important city in the key economic region of Vietnam Central, and also in the public transport development strategy of Vietnam Government. Danang has a series of special characteristics as follows: The average urban radius is about 20 km, and the urban core area is just about 6 km; tourism and services are very developed in Danang and the number of tourist in Danang in 2025 is estimated to be 10 times its population; the average trip length in the urban area is 2.62 trips/day with an average distance of 4 km with an average travel time of private road users of about 17 minutes and for public transport users double that value. The BRT route no. 1 is the major route in the public transport master plan in Danang in year 2020 to 2030. It is located along the most busy traffic corridor form the North-West to the South-East of the city. It is planned to operate in 2017, and then the bus network after operating BRT will be reconstructed. There will be10 regular bus routes and 1 BRT route. The total length of bus network is 338 km, the vehicle fleet includes 150 regular buses and 32 BRT buses.

Before 2020, BRT will be operated in mixed lane traffic with other motorized transport and after 2020, BRT will be operated on dedicated lane.The result of the planned scenarios and "do nothing" (do not develop PuT) scenarios were compared in terms of travel speed impact, environmental emissions, among others.The Study outcome confirms that Da Nang is able to physically, institutionally and financially deliver a BRT route and regular bus service patterns.

2. Conference papers during the 22nd TSSP Annual Conference in Iloilo City, Philippines, Sept. 12, 2014
   - *Mode Choice Analysis of Urban Trips in Iloilo City* by Frederick Sosuan and Alexis Fillone (DLSU-Manila) – preliminary paper in relation to the introduction of BRT system in Iloilo City

     Abstract: To be able to understand the characteristics and preferences of commuters in Iloilo City, a mode choice analysis using revealed preference method was conducted. The study found that the main factors affecting the mode choice were cost and comfort. The socio-demgraphic characteristics like age also affected the decision of the individual.
   - *Introduction of Bus and BRT Systems along a Major Corridor in Iloilo City, Philippines* by Joniemar Calderon, Rowena Delatina, Ritz Michael Lacson, Mary Earl Daryl Grio and Shevanee Ruth De La Cruz

     Abstract: One of the emerging highly urbanized cities in the Philippines is the city of Iloilo, which has a rapidly increasing demand for travel dues to several infrastructure developments currently going on. This study aims to introduce a bus and BRT systems for two main service routes in Iloilo City. The study aims to evaluate the transportation impact of the bus and BRT systems on the current public transport system, passenger movement, traffic behaviour, and urban travel, to assess the environmental benefits of the proposed high capacity public transport.

3. Submitted Conference paper to CODATU 2015, Istanbul, Turkey
   - *Opinion Survey about Pedestrianization of a Heritage Site in the City of Iloilo, Philippines* by Frederick Sosuan and Alexis Fillone – supporting research in relation to the introduction of the BRT system in Iloilo City

     Abstract: In order to compliment the preservation of a heritage site in the City of Iloilo, a pedestrianization system of its streets near the heritage structures were tested from December 2013 to March 2014 during weekends by the City Government. The building structures on the heritage sites were built during the Spanish-American Colonial period (1890-1930) in the Philippines. An opinion survey was conducted through a questionnaire survey of three types of respondents – the pedestrians, public transport drivers, and business owners. The face-to-face interview was used to obtain the respondents opinion in terms of what amenities, activities and supporting traffic management schemes should be provided to support the pedestrianization. Furthermore, the impact of the pedestrianization system on the travel behavior, business operation, service characteristics of affected public transport, and the environment in general were solicited. The results showed that the majority of the respondents favor the continuation of the pedestrianization system near the heritage sites but were concerned about the necessity to properly plan and implement it.

4. A paper entitled, *Effectiveness and Acceptability of Integrated Road Pricing Policy and Bus Rapid Transit in Chiang Mai City* by Dr. Sittha Jaensirisak was presented at The 19th National Convention on Civil Engineering, 14-16 May 2014, Khon Kaen, THAILAND

   Abstract: Due to its cost and flexibility, Bus Rapid Transit (BRT) is known to be able to relieve travel demand and it can also attract travelers to change their behaviors to use

public transport instead of using private car. However, it can reduce only some portion of private cars. So, an idea to integrate road pricing policy to BRT is introduced. This paper presents comparisons of the effectiveness between two different approaches to reduce private car usage including (i) BRT alone and (ii) BRT and Road Pricing. The Stated preference technique was used to collect data from a total of 600 private car users. The selected data analysis methods were Binary Logit model, Segmentation analysis, and Mixed logit model. The results have shown that utilizing BRT together with road pricing policy is more effective than using BRT alone. The effective and acceptable road pricing charge were found to be in the range of 30-60 Baht, with 10 Baht BRT fare. BRT may take longer travel time than private cars as long as the difference does not exceed 33 percent. Implementation of BRT together with Road Pricing policy is thus recommended.

5. A paper entitled, *Integrated Road Pricing and Bus Rapid Transit: the Effect of Habitual Behaviour and Captive Attitude***,** was submitted by Dr. Sittha Jaensirisak to CODATU Conference 2015, Istanbul, Turkey

   Abstract: This paper presents the possibility of using Bus Rapid Transit (BRT) and road pricing policies to reduce private vehicle use in Chiang Mai, Thailand. The assessment is made in terms of level of effectiveness of the integrated policies to shift the use of private vehicles to BRT. Habitual behaviour and captive attitude of private vehicle users were observed. A total of 1,200 private vehicle users (car and motorcycle), was randomly surveyed by a Stated Preference (SP) exercise and attitudinal questionnaire. Two situations were designed including: (1) development of Bus Rapid Transit (BRT) system alone, and (2) development of BRT system with road pricing. The factor analysis was used to classify habitual behaviour and captive attitude, while Logit model was used to analyse the effects of the BRT and road pricing. The study found that most private vehicle users believed that private vehicles were important for their daily lives and would still be essential even if a comprehensive public transport system had been implemented. They felt that using private vehicles had great benefit and they had intention of using private vehicles even for short distances. The study also showed that utilising BRT system development together with road pricing is more effective than BRT system development alone. Therefore, improvement of BRT system would be more effective if it is integrated with restraint measures (e.g. road pricing) that can reduce habitual behaviour and captive attitude.

6. Dr Paramet's Activities related to public transport planning

   - A paper presented at the 19th National Convention on Civil Engineering at Khon Kaen, Thailand, titled "Development of Mode Choice Models between Private Vehicles and Electric Bus in Prince of Songkla University"
   - A paper submitted to CODATA2015, 2-5 February 2015, Isatanbul, Turkey, titled "Challenge of Public Transport Planning in Private Vehicle dominated community"

7. Dr. Atsushi Suzuki, et.al., presented a paper entitled, *"Micro-simulation of Household Location Choice with Matching Based Housing Market Model"* in the 13th WCTR conference in Rio de Janero, Brazil

Abstract: The objective of this study is to develop housing market model for household location choice incorporating transaction process of housing market into spatial micro-simulation by focusing on the matching between households and houses to which they need to move. Boston mechanism was applied to the matching algorithm for our housing market model. Preferences for houses by households were estimated in the way of choice-based conjoint analysis with the data of over 5,000 households collected by our survey in Toyama city. After the trial simulation, our model was confirmed to produce useful and credible output for the better planning and policy assessment.

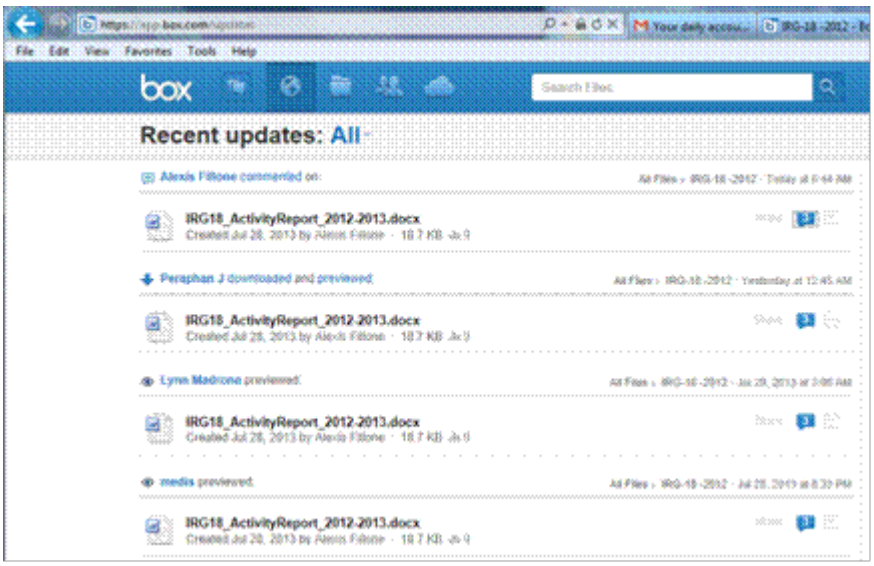
8. Dr. Thaned Satiennam presented a paper entitled, *Study of Short-term Measures to Reduce CO2 Emission from Transport Sector in Khon Kaen City*, at the 19th National Convention on Civil Engineering, 14-16 May 2014, Khon Kaen, THAILAND

Abstract: The objective of this study is to propose and evaluate the short-term measures for reduce carbon dioxide (CO2) emission of transportation in Khon Kaen City. This study proposes four short-term measures for reduce CO2 emission. Including 1) SHIFT of travel trips by gasoline motorcycles to electric motorcycles, 2) SHIFT of travel trips by parent's private vehicles to school bus, 3) IMPROVE of public service along Mittraphap Highway by replacing existing Song Thaew with Minibus, and 4) Integrated all measures. This study was applied the by Bottomup2 method to estimate CO2 emission from transportation sector in Khon Kaen city. The demand forecasting model was applied to calculate the traffic volume and average velocity of each link which were further applied with the CO2 emission factor to calculate CO2 emission of vehicles along each link. The result of study indicated that integrated all measures could reduce CO2 emission higher than other measures.

・Group meeting: (Date, Venue & abstract)

1. Meeting with Prof. Dr. Atsushi Fukuda and Dr. Alexis Fillone in Bangkok, Philippines last August 22, 2014 regarding the final contents of the book and other plans of the IRG group.

2. Continuously using the web-based Venue for discussion and exchange of ideas and researches in relation to the research on BRT (see image below). Under the https://app.box.com



・Result of application for the research grants:(Name & result)

1. At DLSU-Manila, two Master's student is doing a research in relation to the topic related to the IRG with the following initial topics

   1.a Sustainable transport Strategies for Iloilo City, Philippines by Mr. Frederick Sosuan (BS-MS Student) – National government scholar (DOST-PCIEERD) with research funding for thesis. He is expected to graduate in December 2014

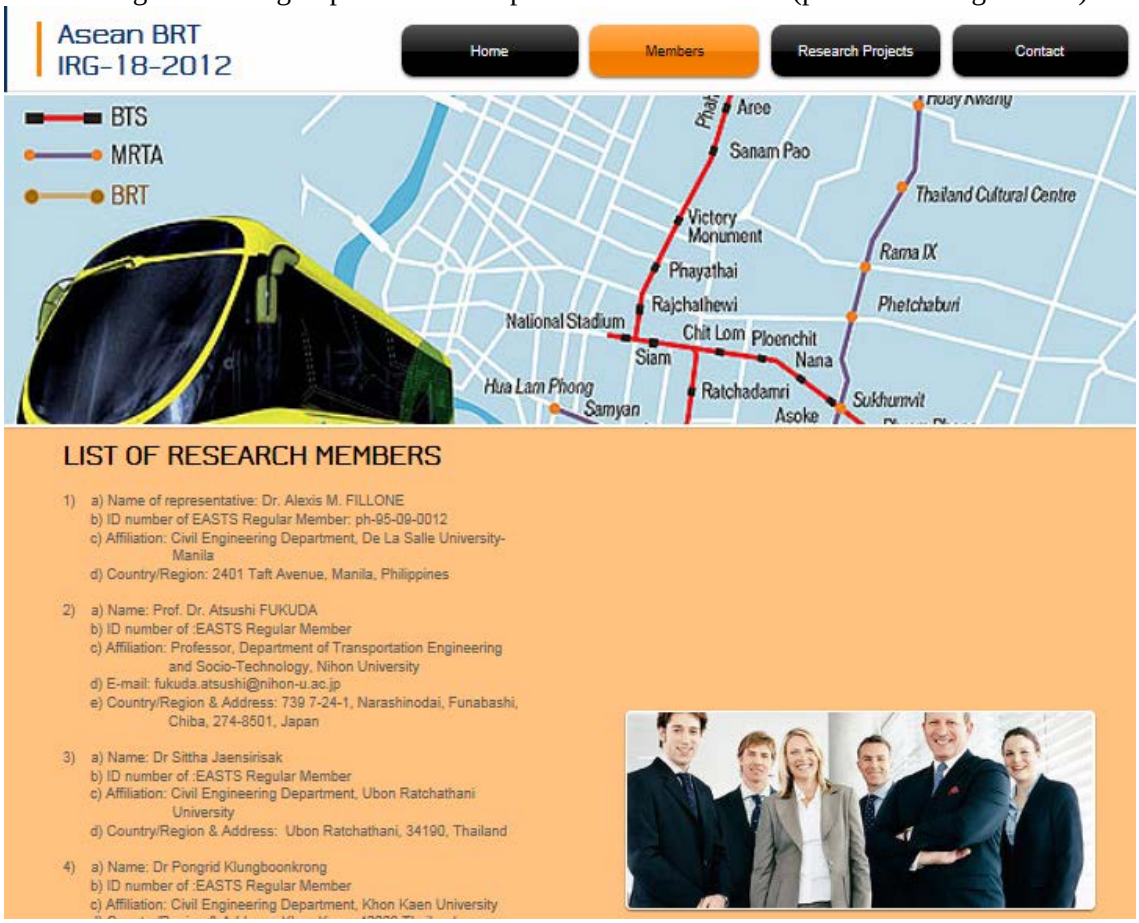
   1.b Public Transport Demand Modeling for BRT Systems by Mr. Sean Ting (BS-MS Student) – National government scholar (DOST-PCIEERD) with research funding for thesis. He is expected to graduate in December 2015

2. At DLSU-Manila, currently doing a study entitled, Optimal Scheduling of a **Pub**lic Transport System along a **Fix**ed Route **(PUBFix)** which is funded by the Department of Science and Technology (DOST-PCIEERD) and one of its objectives is to identify possible road corridors where a BRT system can be deployed in urban-suburban Mega Manila. The research is for two years (2014-2015).
3. Dr. Paramet is supervising three Master students who are doing research in relation to the IRG topic:
   - Thesis titled "Development of Mode Choice Models between Private Vehicles and University Bus Service in Prince of Songkla University" (2012-2014)
   - Thesis titled "Development of Mode Choice Models for Non-motorized and Public Transport Planning" (2014-present)
   - Thesis titled "Development of Mobile Application to Support Campus Bus in Prince of Songkla University" (2014-present)

・Promotional activities of your IRG: (Homepage, Newsletter, Mailing list etc.)

- Developed a website http://amfillone.wix.com/aseanbrt
- Please see image below

- The mailing list of our group members are provided in the website (please see image below)



2.2 Shortage point

- Limited correspondence and information from other group members regarding their research activities related to the IRG.
- May need to encourage cooperation of all members to facilitate the final research output in preparation for the next EASTS conference in Cebu City, Philippines

3. Activity plan in 2014-2015

- Continue with research activities related to the IRG
- More research collaboration with IRG members
- Prepare researches and papers for the coming EASTS conference in Cebu City, Philippines in September 2015

3. Special instruction (additional member etc.)

- Additional members invited to join the group to strengthen the research activities and direction include
    a. Dr. Atsushi SUZUKI, Department of Civil Engineering, Meijo University, Nagoya, Japan
    b. Dr. Mikiharu ARIMURA, Muroran Institute of Technology, College of Environmental Technology, Muroran, Hokkaido, Japan
    c. Dr. Paramet LUATHEP
    Department of Civil Engineering, Faculty of Engineering,
    Prince of Songkla University, Hatyai, Songkhla, Thailand,
    d. Asst. Prof. Dr. Pongrid KLUNGBOONKRONG
    Deputy Director
    Sustainable Infrastructure Research and Development Center (SIRDC),
    Department of Civil Engineering,
    Faculty of Engineering,
    Khon Kaen University, Khon Kaen, Thailand