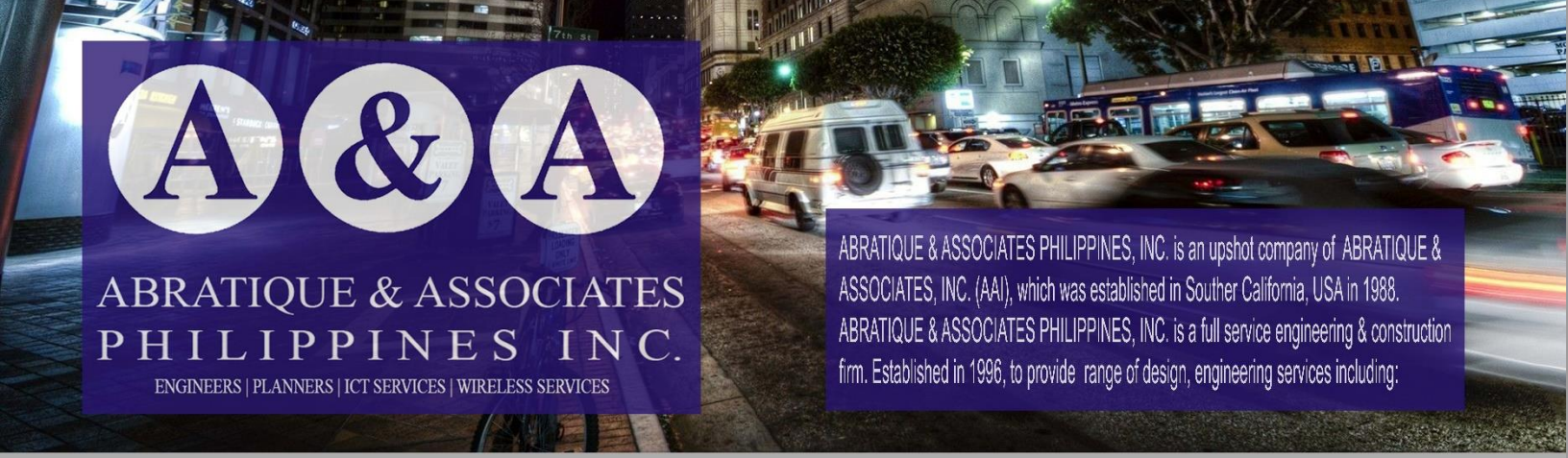
Transportation Science Society of the Philippines

24th ANNUAL NATIONAL CONFERENCE

July 21, 2017
National Center of Transportation Studies
University of the Philippines
Diliman, Quezon City

Improving Quality of Life in Urban & Rural Areas through Inclusive Transportation



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24TH ANNUAL NATIONAL CONFERENCE OF THE TSSP

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MESSAGE FROM THE EASTS PRESIDENT

Dear Members of TSSP,

On behalf of Eastern Asia Society for Transportation Studies (EASTS), I am pleased to extend my warmest congratulations to the 24th Annual Conference of the Transportation Science Society of the Philippines (TSSP). Taking this opportunity, I would like to express my sincere appreciation to distinguished members of TSSP for their dedication to host the 20th anniversary international conference of EASTS in Cebu in 2015. It was surely successful and memorable for our society. We will never forget your very kind hospitality extended to our participants during the conference.

EASTS was founded in 1994 with 13 countries/regions of Eastern Asia. Now its membership has grown to 19 member domestic societies. The primary objective of EASTS when it was founder was to foster and support excellence in transportation research and practice. That remains the Society's objective until now. In line with the objective, EASTS is organizing international research groups, international cooperative research activities and the special research projects as well as international conferences.

It is without doubt that TSSP has contributed significantly to the historic events of EASTS and could be a more essential key player in this region. I am surely convinced that TSSP will strive for better transportation system in the country and make continuous significant contribution to our society's future.

Once again, congratulations to the successful 24th Annual Conference.

Tetsuo Yai, Dr. Eng.
President of EASTS
Vice-President and Professor of Tokyo Institute of Technology

MESSAGE FROM THE TSSP PRESIDENT

Dear Members of TSSP,

The annual conference is one of the major events held by the Society to put into action one of its objectives of disseminating knowledge in transportation to its members and colleagues in the industry. This year's theme - ***Improving Quality of Life in Urban & Rural Areas through Inclusive Transportation***- is both relevant and timely. Relevant because inclusiveness is the key to promoting the twin engines of quality life, namely, growth and equity. We have been told and have seen for ourselves that development must touch the lives of all people, not just the more advantaged classes, for it to be meaningful and sustainable. And timely because as an organization, we are called upon to act on the challenges that inclusive transportation brings. Furthermore, with the ***BUILD! BUILD! BUILD!*** slogan of the National Government, more transportation experts are needed to support the design, development and implementation of sustainable transport projects. This annual conference contributes to addressing that challenge.

It is hoped that all participants will be able to learn something from the knowledge shared across researches by students and colleagues and more importantly, find application in their line of work.

Thank you!

Alexis M. Fillone, Dr. Eng
TSSP President

24th Annual Conference

Theme: Improving Quality of Life in Urban & Rural Areas through Inclusive Transportation

July 21, 2017 (Friday)
Venue: National Center for Transportation Studies
University of the Philippines, Diliman, Quezon City

PROGRAM

Time	Activity
8:00-9:00 AM	Registration
9:00-9:30 AM	Opening Program - National Anthem - Invocation - Welcome Remarks **Dr. Alexis M. FILLONE** President, TSSP
9:30 – 9:45 AM	Introduction of the Keynote Lecturer **Dr. Hilario Sean O. PALMIANO**
9:45 - 10:15 AM	Keynote Lecture: *Emerging Asia Strategy for Transport-oriented Sustainability* **Prof. Dr. Tetsuo YAI** President, EASTS/ Vice-President and Professor, Tokyo Institute of Technology
10:15-10:30 AM	***Break***
10:30-11:30 AM	Panel Discussion/Presentation Theme: *Improving Quality of Life through Inclusive Transportation* Facilitator: Dr. Ma. Sheilah G. NAPALANG
11:30 - 12:00 NN	Open Forum
Master of Ceremonies: **Dr. Cresencio M. MONTALBO, Jr.**	
12:00 - 1:30 PM	***Lunch***
1:30 - 3:00 PM	Technical Sessions (TS) 1& 2 [Parallel Sessions
	TS 1: Non-Motorized Transport • An Assessment of Bikeways Safety in Pedestrian Crashes Prone Areas in Marikina City *[Camba, M.D., Dimayuga, R.D.H. and Doroy, N.B.]* • Assessment of Mobility of Persons with Disabilities (PWDs) in Cainta, Rizal *[Pajarin, J.B., Soriano, C.M. and Regidor, J.R.]* • Pedestrianization in Baguio City *[Agustin, E.D.T., Buhay, J.I.I., Gilbuena, K.K.T., Reyes, M.S.C., Roxas, N.Jr.R. and Paringit, M.C.R.]* • Study on Walkability around Stations of Urban Railway in Bangkok *[Ozawa, H., Malaitham, S. and Fukuda, A.]*
	TS 2: Public Transportation • Estimating Potential Economic Losses from a Nationwide Jeepney Strike *[Roquel, K.I.D., Fillone, A.M. & Yu, K.D.]*

	• Jeepney Service Operation and Demand in Baguio City *[Ranosa, L.L., Fillone, A.M. and De Guzman, M.P.]* • Impact Analysis of Aerial Ropeway Transport System as a Form of Mass Transportation in Baguio City *[Estrella, A.F., Mendoza, A.K., Mendoza, M.A., Sanchez, K., Fillone, A., Paringit, M.C. and Roxas, N.]* • Proposed Standard Jeepney Fare Using Fuzzy Logic *[Bacero, R., Bandala, A. and Fillone, A.]*
3:00 - 3:15 PM	***Break***
3:15 - 4:45 PM	Technical Session 3 & 4
	TS 3: Transport Planning and Policy • Social Equity in Urban Transport: The Case of Metro Manila, Philippines *[Villaraza, C.M., Mella-Lira, B., Fillone, A., Hickman, R. and Biona, J.B.M.]* • The Influence of Rainfall on the Mode Shifting Behavior of Commuters: The Case of Ortigas CBD Workers *[Sunga, A., Diaz, C.E. and Napalang, M.S.]* • Assessment of the Air Quality of C.P. Garcia Avenue Along the Institute of Civil Engineering (ICE) Compound *[Angeles, E.J.L., David, J.E.L., Vergel, K.N. and Orozco, F.]* • Multicriteria and Indicator-based Desirability Assessment of Transport Systems *[Lopez, N.S., Biona, J.B.M., Fillone, A. and Shwanen, T.]* • Addressing Motorcycle Safety through Regulations: Challenges and Issues in the Philippines *[Napalang, M.S.G., Mappala, A.U., Ronquillo, T.R., Lobendino, M.E., Angeles, B.M. and Almazan, R.P.]*
	TS 4: Urban and Regional Planning • Tracing the History of the Philippine National Railways: Historical Geographic Visualization of the Ferro-Carriles en Isla de Luzon (1891-1945) using a Geographic Information System *[Damian, J., Mabazza, D. and Villasper, J.]* • Comparison of Trip Attraction Between Malls and Schools in the City of Dagupan, Philippines *[Zamora, J.T. and Fillone, A.M.]* • Changes in Inter-City Travel Behavior in Metro Manila due to Flooding *[Abad, R.P., Fillone, A.M. and Schwanen, T.]* • Influence of Transportation Services in the Socio-Economic Development: The Case of North Cotabato Province *[Alucilja, K.M.B. and Fillone, A.M.]* • A Stated Preference Study to Determine Demand Shift for a Proposed Expressway Along C-5 *[Pique, G.M.L. and Fillone, A.M.]*
4:45 – 5:00PM	Closing Remarks - Dr. Karl N. VERGEL Vice-President, TSSP

Tracing the History of the Philippine National Railways: Historical Geographic Visualization of the *Ferro-Carriles en Isla de Luzon* (1891-1945) using a Geographic Information System

Johnson DAMIAN, Daniel MABAZZA

Abstract: Archival documents, maps, and plans were digitized and adopted in a Geographic Information System (GIS) to cartographically visualize the historical geography of the *Ferro-carriles* railway system in the Philippines (1891-1945). These rail lines, which would soon be the property of the Manila Railroad Company (MRC) and eventually the present-day Philippine National Railways (PNR), were mapped using ArcGIS 10.

The study focuses primarily on the application of GIS methods to historical transport studies as it seeks to visualize the history of a railroad system which is now just a shadow of its former self in the early 1900s. Using GIS, factors which possibly impacted the development of the railways such as historical plans and population were mapped and investigated. Moreover, this research aims to uncover trends in transport planning and development in the Philippines, as well as contribute to the growing literature and set of techniques employed in GIS for historical transport studies.

Keywords: GIS, Railways, Urban Transportation, Transport History, Mapping, Historical Geography

Estimating Potential Economic Losses from a Nationwide Jeepney Strike

Krister Ian Daniel ROQUEL, Alexis FILLONE, Krista Danielle YU

Abstract: Last February 6 and February 27, 2017, jeepney operators mounted a strike in protest to the planned phase-out of their vehicles. The strike happened in over 20 cities and municipalities across the country. This resulted to thousands of passengers getting stranded, forcing those affected to suspend work and classes. From how the strike put the economy at a standstill, it can be concluded that the country incurred economic losses from it. Stoppage of operations sprawled out onto other sectors, thereby causing a chain of operation disruptions, lowering productivity, and ultimately, decreasing economic output. Thus, to have an idea on how much of an impact the jeepney strike had, loss estimates should cover the entire economy. Having this value could affect the negotiations between the government officials and jeepney operators. In this paper, the overall economic loss incurred by the country was estimated using an Inoperability Input-Output Model, where the reported values of jeepney strike participation in various regions were used as the initial perturbation. Based on the available data, the jeepney strike is estimated to have resulted to an overall economic loss of over Php 471 million, or approximately 1.28% of the Philippines' daily GDP.

Keywords: jeepney strike; inoperability input-output model;

An Assessment of Bikeways Safety in Pedestrian Crashes Prone Areas in Marikina City

Mutya CAMBA, Rozel Denise DIMAYUGA, Nelson DOROY

Abstract: Marikina City's Bikeways is hailed as the first in the Philippines and Marikina is considered as a "Bicycle Friendly City". This study assessed the safety of Marikina's bikeway infrastructure by identifying the location of vehicular accidents and pedestrian crashes, evaluating its current conditions and/or design in these areas, and analysing the bikeways safety issues using the road and transport system approach framework adapted from the World Health Organization. This paper presents three factors in determining bikeways safety: (1) health hazard, the air quality of Marikina was rated from good to moderate, (2) motorist behaviour, the perspectives of cyclists and non-cyclists on the use of bicycle as alternative were discussed, and (3) bikeways infrastructure, facilities and elements that are present or are lacking in the bikeways infrastructure were examined. The study concluded that the absence of one factor can make the roads unsafe for cyclists.

Keywords: road safety, bikeways safety, pedestrian safety, road accidents, bicycle accidents

Assessment of Mobility of Persons with Disabilities (PWDs) in Cainta, Rizal

Justine Brylle PAJARIN, Conrad Matthew SORIANO, Jose Regin REGIDOR

Abstract: This study aims to address the problems on the mobility of PWDs. Set in Cainta as the location, it involves both qualitative (survey questionnaires for PWD and non-PWD, as respondents) and quantitative assessment (pedestrian facilities and public transportation vehicles). The researchers determined from these methods that the respondents gave more importance to safety than the other factors affecting mobility. Common problems encountered in using transportation vehicles and facilities were also enumerated. Results show that the transportation facilities and vehicles are poorly designed for PWDs. PWDs have limited choices on their use of transportation vehicles and facilities and have experienced difficulties in boarding and alighting vehicles. There are many obstructions on transportation facilities, especially on sidewalks, that impede seamlessness of their travel from one point to another. The researchers gave recommendations on the designs and layouts of transportation vehicles and facilities in order to improve mobility of PWDs in the municipality.

Keywords: Mobility, PWDs, Transportation Facilities, Transportation Vehicles, Urban Setting

Pedestrianization in Baguio City

Elearina Dolores T. AGUSTIN, Jo Isabella I. BUHAY, Kathleen Kay T. GILBUENA, Maria Sophia C. REYES, Nicanor R. ROXAS Jr., Maria Cecilia R. PARINGIT

ABSTRACT: Baguio City is well known as the "Summer Capital of the Philippines." This has affected the vehicular and pedestrian movements in Lower Session Road, which led to the proposal of pedestrianization of the area. Pedestrianization is a traffic-calming method wherein a portion of Lower Session Road is closed for vehicles to give way to pedestrians. However, before executing this method, perception surveys were handed out to pedestrians, business owners, car users, and public utility drivers for the researchers to know their origin, destination, factors which they think are important when they are walking and the effect of pedestrianizing said road with respect to their daily activities. Although the survey response from the different groups gave positive feedback, the respondents' main concern is the congestion that will affect the neighboring streets when Lower Session Road is closed. Knowing this, rerouting is a top priority to spread the vehicular traffic evenly.

Keywords: pedestrianization, Baguio city, traffic calming

Jeepney Service Operation and Demand in Baguio City, Philippines

Lovely L. RAÑOSA, Alexis M. FILLONE, Mark P. DE GUZMAN

Abstract: The jeepney is a very unique public transport mode not only as a vehicle but also in the ways it is operated and utilized by passengers. This paper presents the characteristics of the public utility jeepney service operation and demand in Baguio City. The analysis is made on the basis of various field surveys conducted. The rationalization of color-coded trunklines (Red, Blue, Green and Yellow) of jeepneys comprising 116 jeepney lines and associations and 4208 units are thought to determine the exact number of vehicles on the road to complement the carrying capacity of the city's roads.Results show that the average jeepney load factor computed is 0.84 or 84%, the average jeepney trips per day is 7.48, the average seating capacity is 20.98 and the utilization ratio is 0.95. Moreover, the average speed of jeepneys is at 9 kph at an average distance of 4.140 kilometers. This paper provides an initial analysis regarding the demand and supply of jeepneys serving particular routes in Baguio City.

Keywords: Jeepneys, Public Transport, Jeepney demand and supply

Analysis of Inter-city Travel Behavior in Metro Manila during Flooding

Raymund Paolo ABAD, Alexis FILLONE, Tim SCHWANEN

Abstract: This paper presents the results of a preliminary survey aimed to characterize inter-city travel behaviour of people during flood events. In the survey, respondents were given four (4) travel choices for the flood event. Results show about 91% of the total respondents (n=159) were stranded and waited for conditions to improve while others continued to travel. Results also showed the absence of alternate travel plans which might explain the lack of response in mode or route changes. A binomial logit model was developed to determine the factors that affect inter-city travel behaviour during flood events. The model showed that trip purpose, flood experience, main public transport mode used, flood height, and travel distance are related in making a travel decision during flood events in Metro Manila.

Keywords: flooding, choice modelling, Metro Manila

Influence of Transportation and Accessibility to Basic Services in the Socio-Economic Development in the Province of North Cotabato

Kathleen Mae B. ALUCILJA, Alexis M. FILLONE

Abstract: Transportation and accessibility to basic services provided in a province is of great importance in municipal or provincial and even in regional planning division to insure that these services can reach and serve the community. Transportation services in a province can significantly influence its socio-economic status. This study was aimed to establish the relationship between transport services and the poverty incidence among families in North Cotabato Province. This study aims to determine if (a) the road access and access to public transportation have relationships to the total enrollment of public elementary and secondary schools; and (b) what transport variables can influence the socio-economic development of the province. Analysis showed the significant influence of distance of public elementary schools to its enrollment. Access to basic services can significantly influence the poverty level of the province. The location of schools, hospitals and economic centers in terms of its distance from the population center is of great importance to maximize the delivery of these services. Furthermore, the quantity of road access needs to grow parallel with the land area to lessen the poverty incidence among families. These results are useful for future planning to alleviate poverty in the province.

Keywords: Transport, Socio-economic profile, shortest path, road density, road pavement

Social Equity in Urban Transport: The Case of Metro Manila, Philippines

Cristina Mirella VILLARAZA, Beatriz MELLA-LIRA, Alexis FILLONE, Robin HICKMAN, Jose Bienvenido Manuel BIONA

Abstract: This study looks at how low-income (LI) and high-income (HI) groups view their transport experience in Metro Manila based on six dimensions: health, physical and mental integrity; senses, imagination and thoughts; reasoning and planning; social interactions; natural environment and sustainability; and infrastructure. The assessment makes use of a mobility desirability gap as viewed by each group. It is computed as a percentage difference of the groups' current mobility score and desired score for each of the assessment criteria. A single score is also computed for each group by summing up the weighted score of each component that is based on the degree of importance scored by the respondents. The study also looks at how the two income groups rate various transport modes according to: pleasure, efficiency, social status, and physical integrity, comfort and convenience.

Keywords: Social equity, Social classes, High and low income groups, Urban transport

Impact Analysis of Aerial Ropeway Transport System as a Form of Mass Transportation in Baguio City

Alessandra Francesca ESTRELLA, Anna Kristina MENDOZA, Mel Anthony MENDOZA, Kim SANCHEZ, Alexis FILLONE, Maria Cecilia PARINGIT, Nicanor ROXAS

Abstract: This study aimed to assess the impact of integrating a new form of mass transportation, which is the Aerial Ropeway Transport (ART) system, into the current transportation network of Baguio City. Currently, there is only limited mass transportation available in Baguio and residents have to take private vehicles or public transportation in the form of jeepneys, metered taxis, or provincial buses. Vehicle congestion is one of the reasons for traffic in Baguio and introducing a new form of mass transportation, that will only require a limited amount of structure footprint, will improve the current situation. The objective of this study was to assess the acceptability of a proposed ART system in Baguio City. Also, this study looked into the current characteristics of transportation in the city, proposed the most appropriate route based on travel demand, and formulated mode choice equations to determine the significant factors affecting the commuters' choice to switch to ART as an alternative mode of transportation. The study included surveys and data analysis in order to completely assess the integration of the system. The proposed ART, which is a unique mode of transportation, will reduce traffic congestion since more residents will prefer to use the ART over any other mode of transportation.

Keywords: aerial ropeway transport system, cable cars, urban mass transportation, mode choice analysis

Proposed Jeepney Fare Using Fuzzy Logic

Riches BACERO, Argel BANDALA, Alexis FILLONE

Abstract: One of the most popular mode of transportation in the Philippines is jeepney. Despite of its popularity, there is always an issue of losses among jeepney operators and drivers that lead to fares hikes and transport strike. Jeepney fare is a constant debate that needs to be resolved whether there is a need to increase or not. This study aims to develop and propose a standard jeepney fare model in Metro Manila using fuzzy logic. Fuzzy logic provided highly accurate technique to model standard jeepney fare. The factors that were considered in the study are total cost and distance. Total cost includes diesel price, fixed costs, maintenance cost, and operator's profit. A flat fare is applied for the first 4km and increasing fares for every succeeding 1km. The study result shows that fuzzy logic can be used to accurately model the jeepney fare.

Keywords: Fuzzy Logic, Fare, Jeepney

The Influence of Rainfall on the Mode Shifting Behavior of Commuters: The Case of Ortigas CBD Workers

Abigail SUNGA, Crispin Emmanuel DIAZ, Ma. Sheilah NAPALANG

Abstract: This paper presents an analysis of how rainfall influences the mode shifting behavior of CBD work-to-home commuters in Metro Manila, Philippines. After collecting data using a questionnaire survey, the analysis shows that the fare, travel time, walking time, waiting time, reliability, comfort and safety of the modes servicing the CBD significantly changes during heavy and intense rainfall. The level of switching to other alternative public transport modes is at 17.67%, 39.33% and 44.67% during light rain, heavy rain and intense rain respectively. GrabCar/Uber gains the most patronage while FX/van loses the most as rainfall intensity increases. The binary logistic regression analysis done shows that the decrease in reliability in public transport modes trigger mode shifting.

Keywords: rainfall, trip decisions, mode shifting behavior

Assessment Of The Air Quality Of C.P. Garcia Avenue Along The Institute Of Civil Engineering (ICE) Compound

Eugene Jose L. ANGELES, John Edzer L. DAVID, Karl B.N. VERGEL, Ivan Francis OROZCO

Abstract: This study assessed the air quality of C.P. Garcia Avenue along the I.C.E. Compound. The air quality, Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), and Particulate Matter 2.5 ($PM_{2.5}$) concentrations, were observed for compliance with Philippine Clean Air Act of 1999, and the DENR Administrative Order 2013-13 standards for CO and NO_2, and $PM_{2.5}$ respectively. Data such as wind velocity, traffic speed and volume, and vehicle type were correlated to determine the factors that greatly affect the air quality using simple and multiple linear regressions. The 10-minute lag regression model was developed for CO, the 30-minute lag regression model for NO_2, and the no lag regression model for $PM_{2.5}$. These results were checked with the computed pollutant transport aided regression models and it was found that the multiple R values were close to each other. The traffic volume and speed were proven significant using P-test of 95% confidence with values less than 0.05.

Keywords: Air Quality, Pollutant Concentration Standards, Traffic Characteristics, Wind Velocity, Regression Analysis

Multicriteria and Indicator-based Desirability Assessment of Transport Systems

Neil Stephen LOPEZ, Jose Bienvenido Manuel BIONA, Alexis FILLONE, Tim SCHWANEN

Abstract: Mobility is a human need. Plenty of assessment techniques and methodologies are available in literature, however, the indicators selection lack conceptual justification, and most miss considering the social aspect of transportation. Transportation is now necessary to meet almost every human need: to eat, to work, to study, to avail healthcare, etc. Through a topic-based approach, the present study proposes a set of indicators for transport desirability assessment, around the three themes of performance, sustainability and fairness. A systematic literature review is conducted to evaluate existing approaches, and the completeness of the proposed set is considered. The set of indicators, namely: efficiency, environmental impact, resilience, accessibility, and social equity are proposed. The set of indicators are presented in this paper to invite critical discussion and debate, with the goal of arriving at the proper indicators for transport desirability.

Keywords: Transport Desirability, Multicriteria, Indicators, Assessment

A Stated Preference Study to Determine Demand Shift for a Proposed Expressway Along C5

Gene Martin L. PIQUE, Alexis M. FILLONE,

Abstract: Various measures have been proposed in previous studies to address Metro Manila's traffic congestion including an expressway along Circumferential Road 5 (C5). C5 traverses seven (7) cities and one municipality and serves as a vital thoroughfare which is complementary to Circumferential Road 4 or EDSA. This study utilized Stated Preference data through administered questionnaires to C5 users. Respondents were given nine (9) scenarios of varying combinations of toll fee and time reduction selecting whether to take the expressway or retain their current route for each scenario. A multinomial logit model was then estimated to establish the behavior of road users if the alternative of an expressway was introduced.

Keywords: stated preference, C5, expressway, choice model

Addressing Motorcycle Safety through Regulations: Challenges and Issues in the Philippines

Ma. Sheilah G. NAPALANG, Aileen U. MAPPALA, Teresita R. RONQUILLO,
Maribelle E. LOBENDINO, Bernadette M. ANGELES , Ramil P. ALMAZAN

Abstract: Due to its perceived operational flexibility (i.e., allows motorcycle rider to weave through traffic) and affordable acquisition cost, the motorcycle has become a popular mode of transportation. However, with increased utilization, its involvement in road crashes has likewise increased. This paper looksinto the key regulations on motorcycle operations in the Philippines and attempts to evaluate how effectively these regulations have been enforced based on secondary data. It also presents the result of a survey conducted with more than 1,000 respondent to determine a composite socio-economic profile of motorcycle drivers and their awareness of the key regulations pertaining to motorcycles. The results of the research show that 1) although the regulations governing motorcycle operations are considerably robust, these do not give emphasis on driver education, except perhaps in relation to the application and renewal of licenses, and 2) enforcement of these regulations is weak due to lack of equipment and corruptible manpower.

Keywords: Sustainable Transport, Road safety regulations, enforcement

Study on Walkability around Stations of Urban Railway in Bangkok

Hironori OZAWA, Atsushi FUKUDA, Sathita MALAITHAM

Abstract: Although urban railways have been developed in Bangkok, ridership is quite low, because there are few people to access the railway stations by walking. To increase the number of people to access the stations by walking, improvement of walking environment is one of crucial measures. However, the existing conditions of walking environment around stations have not been grasped in Bangkok. Thus, this study intended to observe the existing conditions of walking environment around the stations in Bangkok. Firstly, walkability index was defined to evaluate walking environment around the stations from view point of "ease of passing" and the method to measure it by giving weight to evaluation items based on AHP was developed. Secondly, measured walkability index near the stations was compared with Japanese case, where the land readjustment project has been applied. As the result, it was found that the existing conditions of walking environment around the stations in Bangkok were not high.

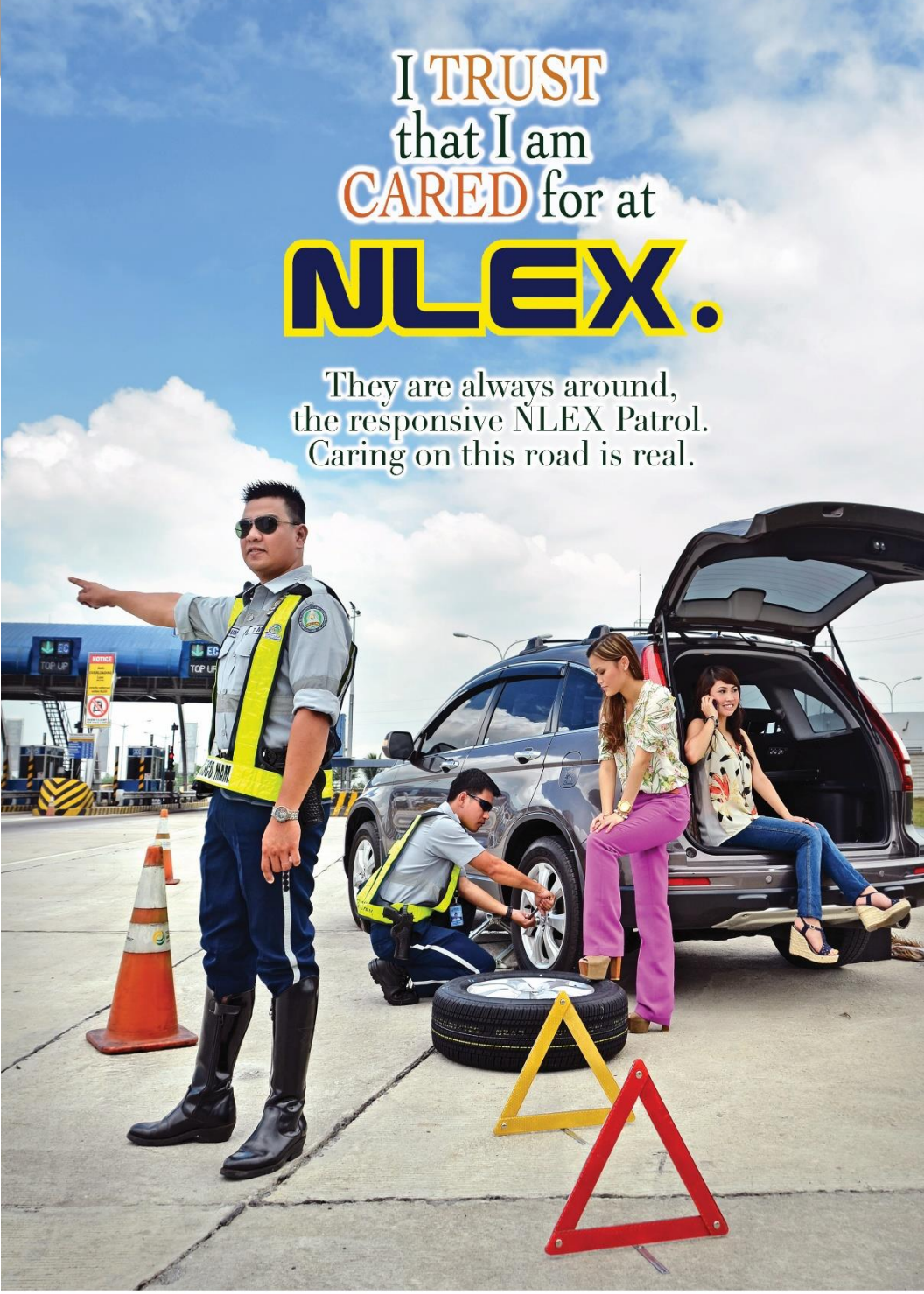
Keywords: Walking Environment, Walkability, AHP

Comparison of Trip Attraction Between Malls and Schools in the City of Dagupan, Philippines

John T. ZAMORA, Alexis M. FILLONE

Abstract: This study aimed to compare the trip attraction, their characteristics and behavior, among selected shopping malls and selected schools in Dagupan City. Descriptive and basic statistical analyses were used to analyze the data including use of EMME software to simulate the trip generation/attraction among the schools and shopping malls. This paper is conceptualized based on the observation that traffic congestion is one of the common transportation problems encountered by developing cities in the Philippines where Dagupan City is not an exemption. Dagupan City is a commercial hub north of Manila and a center of education in the region. Shopping malls and schools in the City of Dagupan are observed to be the major trip generators in the city that have significant impact on road congestion. The salient findings of the study showed jeepney and tricycle are the common mode of choice used by majority of commuters going to school and mall. The results also showed that vehicle volume and pedestrian counts attracted to the school and the mall have different peak periods. This finding will have some implication when introducing travel demand management schemes to the city.

Keywords: Road Congestion, Trip Attraction, Shopping Trips, School Trips



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Phimphun Ovasith (Cherry)
PTV Asia-Pacific Pte. Ltd
7 Temasek Boulevard,
#27-01 Suntec Tower One, Singapore 038987
Phone: +65 6323 2746
Mobile: (SG) +65 9862 6635, (THA) +66 81580 3677
Email: phimphun.ovasith@ptvgroup.com
www.ptvgroup.com
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Merceditas Tuazon
SMDI Consultants
Unit 907 Platinum 2000
7 Annapolis Street, San Juan City
Metro Manila, Philippines
Tel: +63 917 538 9228
E-mail: dttasyt@gmail.com

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U.P. PLANADES
Primitivo C. Cal, PhD.
Executive Director

Address: SURP Building E. Jacinto St., UP Diliman, Quezon City 1101, Philippines
Phone : +632 9274797
Email: admin@planades.com / planades@yahoo.com
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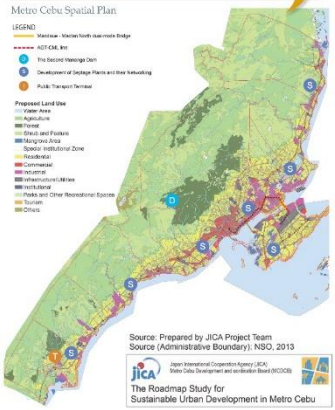

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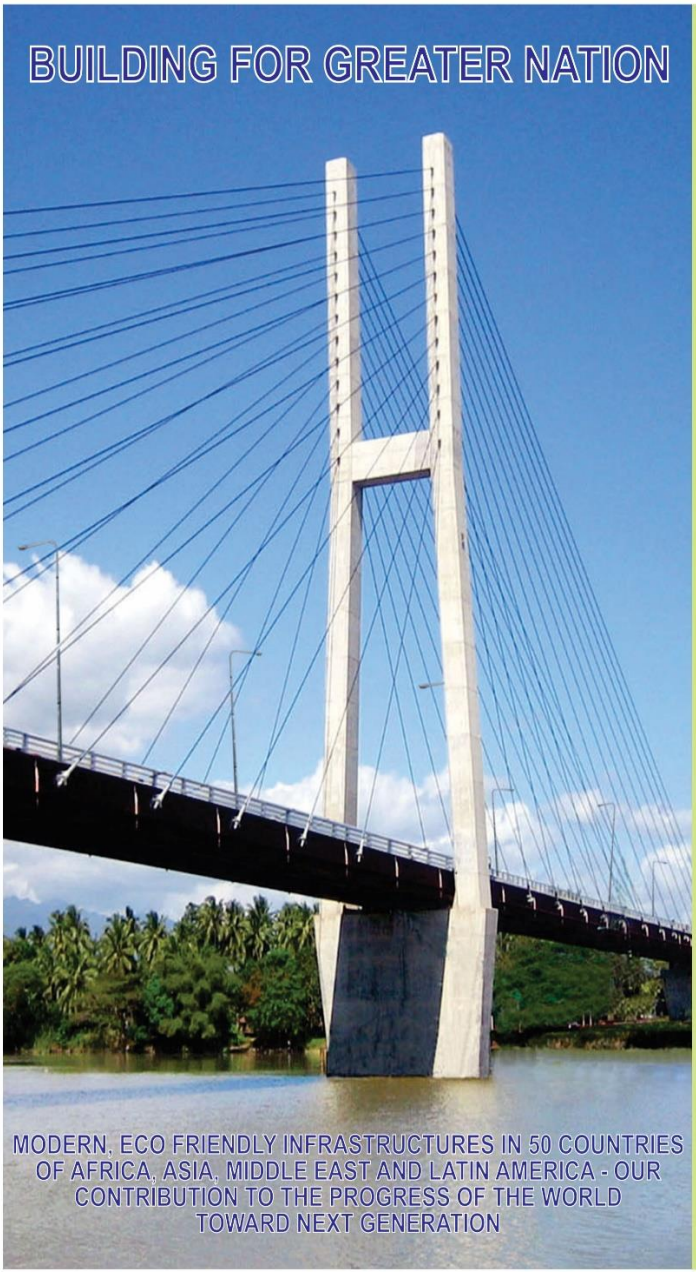

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kei-tokyo@katahira.com; www.katahira.com (Japanese) www.kei-globe.com(English)

PHILIPPINES
Unit 10-C, JMT Corporate Condominium
ADV Ave., Ortigas Center, Pasig City
Tel. (632)634-1624/634-1625
E-mail: katahira@kei-mnl.com

INDONESIA
Level 23. No. GH55, Penthouse Plaza Marein Jl.Jend.
Sudirman Kav 76-78, Jakarta 12910, Indonesia
Tel. No. 622-1-8065-7855 Fax: 622-1-80657888
kei-jakarta@katahira.com

VIETNAM
5th Floor, Locogi 13 Tower, 164 Khuat Duy Tien Street,
Thanh Xuan District, Ha Noi, Vietnam
Tel. No. 84-43 7264060 Fax: 84-43 7264050

SRI LANKA
CMB House 1/4, 2A, Lake Drive
Colombo 08, Sri Lanka
Tel. No. 94-71-4451593 Fax: 94-71-2445337

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