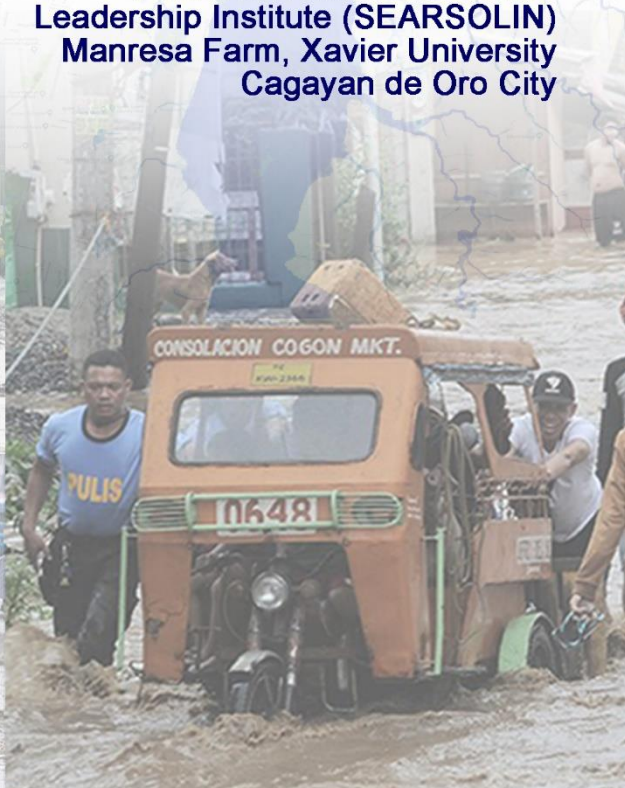
THE 25TH ANNUAL NATIONAL CONFERENCE
TRANSPORTATION SCIENCE SOCIETY OF THE PHILIPPINES

CONFERENCE PROGRAM

ENHANCING **DISASTER PREPAREDNESS** AND **RESILIENCE** THROUGH TRANSPORTATION **ENGINEERING** AND **PLANNING**

July 26-27, 2018
Southeast Asia Rural Social
Leadership Institute (SEARSOLIN)
Manresa Farm, Xavier University
Cagayan de Oro City



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MESSAGE FROM PROF. TETSUO YAI

President of the Eastern Asia Society for Transportation Studies (EASTS)

Dear Members of TSSP,

I am pleased to extend my warmest congratulations to the 25th Annual Conference of the Transportation Science Society of the Philippines (TSSP) on behalf of Eastern Asia Society for Transportation Studies (EASTS). Taking this opportunity, I'd 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 never forget your very kind hospitality extended to our participants during the conference.

EASTS founded in 1994 with 13 countries/regions of Eastern Asia has already 19 member domestic societies as of today. The primary objective of EASTS was to foster and support excellence in transportation research and practice and it never be changed until now. In line with the objective, EASTS is organizing the international research group, the international cooperative research activity and the special research project as well as the international conference.

It is no doubt that TSSP has contributed significantly for history-making major events of EASTS and could be a more essential key player in this region. I surely convince TSSP will strive for the better transportation in the country and make a continuous significant contribution to our society's future.

Once again, congratulations to the successful 25th Annual Conference.

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

MESSAGE FROM DR. ALEXIS FILLONE

President of the Transportation Science Society of the Philippines (TSSP)

Our 25th Annual Conference is marked by two significant breakthroughs. First, for the first time, a pre-Conference activity was held yesterday, July 26 to enable young researchers and graduate students in the transportation field to benefit from the wisdom of current transport experts. Second, we have revived the TSSP Journal just in time for the Conference. Now called the Philippine Transportation Journal, it will feature conference papers that gained very satisfactory ratings from an expert panel. These twin developments are meant to allow a more substantive exchange of knowledge among transport practitioners so that concrete results that we all desire in the field of transportation are brought closer to reality.

In addition to these breakthroughs, it is also significant that we are holding the Conference in Cagayan de Oro City, the fulcrum of progress in Northern Mindanao. In this place we are witnesses to an ongoing duality of challenges and opportunities in transportation planning. Hopefully, our profession that is rooted in engineering will bring added sense to current efforts to establish enduring solutions. Not just in this island group of Mindanao where the Philippine President made his maiden mark in local governance, but throughout the country.

Lastly, the TSSP Board thanks the administration, faculty and staff of Xavier University for generously providing us invaluable support in organizing this Conference.

Dr. Alexis M. Fillone
President of TSSP
Professor, De La Salle University

TRANSPORTATION SCIENCE SOCIETY OF THE PHILIPPINES

25th Annual Conference

"Enhancing Disaster Preparedness & Resilience Through Transportation Engineering and Planning"

Southeast Asia Rural Social Leadership Institute (SEARSOLIN),
College of Architecture, Xavier University, Cagayan de Oro City
26 – 27 July, 2018

DAY 1: WORKSHOP FOR YOUNG RESEARCHERS

Time	Activity
8:00 – 9:00 AM	Registration
9:00 – 9:15 AN	Welcome Remarks Dr. Alexis Fillone President, TSSP
9:15 – 10:00 AM	Talk: 'Career Opportunities and Challenges' in Transportation (Public, Private, Academe)
10:00 – 10:15 AM	Coffee Break
10:15 – 10:45 AM	Talk: "Importance of Research" Dr. Ricardo G. Sigua
10:45 – 11:15 AM	Talk: "Practical Guidance on the conducting of researches" Mr. Marc Hasselwander
11:15 – 11:45 AM	Talk: "How to get published (Research publication do's and don'ts)" Mr. Michael Miller
11:45 – 12:00 PM	Q & A
12:00 – 1:00 PM	Lunch
1:00 – 1:15 PM	Teambuilding activity
1:15 – 2:30 PM	Workshop 1: Mentoring on Abstract Development Dr. Hilario Sean Palmiano
2:30 – 3:45 PM	Workshop 2: Mentoring on Research Paper Outline Development Dr. Alexis M. Fillone
3:45 – 4:30 PM	Workshop 3: Key learnings and future agenda Dr. Anabel Abuzo
4:30 – 5:00 PM	Conclusion / Recognition of Participants

DAY 2: CONFERENCE PROPER

Time	Activity
8:00 - 9:00 AM	Registration
9:00 – 9:30 AM	Opening Program National Anthem Invocation Welcome Remarks President, Xavier University Opening Remarks Mayor, Cagayan de Oro City
9:30 – 10:15 AM	Introduction of the Keynote Lecture Dr. Alexis Fillone Keynote Lecture: **"Research Needs to Prepare for National Disaster in Transport Sector – on the Experience of the Great East Japan Earthquake"** Prof. Atsushi Fukuda
10:15 – 10:30 AM	Break
10:30 – 11:30 AM	Panel Discussion Theme: **"Enhancing Disaster Preparedness & Resilience Through Transportation Engineering and Planning"** Invited presentations and reactions from National Agencies, Local Government, Private Sector and Academe
11:30 – 12:00 NN	Open Forum *[Membership Meeting and Election of Board of Directors – Regular and Lifetime Members in Attendance]*
12:00 – 1:30 PM	Lunch
1:30 – 3:00 PM	Technical Sessions 1 & 2
3:00 – 3:15 PM	Break
3:15 – 4:45 PM	Technical Sessions 3 & 4
4:45 – 5:30 PM	Awarding for Best Paper and Presentation Announcement of New Board of Directors Induction of New Members Closing Remarks Dr. Alexis M. Fillone President, TSSP

TECHNICAL SESSIONS

Technical Session 1: Public Transportation 1
Chair: Dr. Cresencio Montalbo, Jr.

- Assessing the Implementation Arrangements for a City Bus Transport System through a Hybrid PPP Model: The Case of the Pasig City Bus Service
- Determination of Appropriate Public Transportation Mode for a University Transit Route in Accordance with the Omnibus Franchising Guidelines
- Examining the Factors of Modal Shift to P2P Bus Service (Masinag – Greenbelt 5)
- Assessing Walkability in the City of Tacloban

Technical Session 2: Human Vehicle and Traffic Flow Characteristics
Chair: Dr. Ricardo Sigua

- Resilience Assessment of Freight Transport Optimization Programs for the Philippine Greater Capital Region
- Impacts of Different Rainfall Intensities on Key Traffic Flow Parameters at North Luzon Expressway Using Underwood's Exponential Model
- Road Capacity Imbalance at Exit Points of the Metro Manila Skyway and Adjoining Roads
- Factors Influencing Motorcycle Accident Severity in Commonwealth Avenue, Quezon City, Philippines

Technical Session 3: Mode and Route Choice Analysis
Chair: Dr. Hilario Sean Palmiano

- Mode Choice Analysis of Commuters in Intramuros, Manila
- Joint Model of Private Passenger Vehicle Type Ownership and Fuel Consumption in Metro Manila: Analysis and Simulation of Discrete-Continuous Choice Model
- Determining the Value of Time for a Proposed Expressway Along C-5
- Factors affecting travel behavior during flood events in Metro Manila, Philippines

Technical Session 4: Public Transportation 2
Chair: Dr. Hussein Lidasan

- Mode of Public Transportation in Cotabato City
- Operational Characterization of Habal-habal in Selected Municipalities in North Cotabato
- Examining the Potential Significance of Industry Consolidation and Fleet Management in Implementing the DOTr's PUV Modernization Program: A Case Study of 1TEAM

ASSESSING THE IMPLEMENTATION ARRANGEMENTS FOR A CITY BUS TRANSPORT SYSTEM THROUGH A HYBRID PPP MODEL: THE CASE OF THE PASIG CITY BUS SERVICE

Anneli LONTOC, German AVENGOZA, Nelson DOROY, Giel Sabrine CRUZ, Alpher DE VERA, Paolo MANUEL, Candice RAMOS, and Claire de Lune VILLANUEVA

The Ortigas Center is an important urban center in Metro Manila where its roads are often congested. Pasig City implemented a free bus service within Ortigas to address the need for public transportation. This Study assessed the implementation arrangements for a free bus service in Ortigas. The Study finds that there is a valid demand for the bus service as Ortigas is a key trip generator. However, the present free bus service is not financially viable. The Study shows that a fleet size fitted for demand will be more efficient than the current service. The Study finds that a Hybrid PPP Model for the bus service is more viable than a Pure PPP Model and the current arrangements. Both PPP Models will require the same institutional requirements such as a PPP Ordinance, the setting-up of a PPP Committee, and processes consistent with the awarding of local government contracts.

Keywords: Local Public Transport Route Planning, Viability Assessment, PPP Bus Service

DETERMINATION OF APPROPRIATE PUBLIC TRANSPORTATION MODE FOR A UNIVERSITY TRANSIT ROUTE IN ACCORDANCE WITH THE OMNIBUS FRANCHISING GUIDELINES

Aliannah VENTURA, Ana Marie FRAYNA, and Karl VERGEL

New franchising guidelines of public utility vehicles are released and are stated in the Department Order No. 2017-011 of the Department of Transportation (DOTr). According to the order, public utility jeepneys (PUJs) are “restricted from operating along EDSA and national highways... in highly urbanized areas” (DOTr, 2017). With this, Philcoa will serve as a transfer area for passengers going in and out of UP via University Avenue. Given that, the appropriate public transport mode/s that would operate along the consolidated UP-Philcoa route is/are determined, including the number of units needed. As a result, two modes are proposed– Mini-buses and PUJs. If mini-buses would be used, 48 units are required during peak hours; on the other hand, 65 PUJs are needed if PUJs would be considered.

Keywords: Omnibus Franchising Guidelines, Public Utility Vehicles, Transfer Area, UP-Philcoa Route, Mini-bus, Public Utility Jeepney (PUJ)

EXAMINING THE FACTORS OF MODAL SHIFT TO P2P BUS SERVICE (MASINAG – GREENBELT 5)

Rafael April RIVERA, Yrish ESTOCE, Rachel HABANA, Albert KIMPO, Jomach LAGASCA, Rigel MAGCALE, and Ma. Lourdes MANATAD

The road congestion along C5 is mainly due to the volume of private cars, PUVs (predominantly AUVs), and trucks especially during peak hours. On April 17, 2018, a Point to Point (P2P) Bus service was implemented to service the route between SM Masinag in Antipolo to Green Belt 5 in Makati. A total of ninety-four (94) respondents who ride the P2P were surveyed. Cross tabulations and graphical analysis were used to analyze the survey results. The study revealed that comfort, convenience, safety and reliability are the major factors influencing passengers to try the P2P.

Keywords: Public Transport, Modal Shift, Point-to-Point (P2P)

ASSESSING WALKABILITY IN THE CITY OF TACLOBAN

Sheila Flor D. JAVIER, Jerome N. BALLARTA, and Jose Regin F. REGIDOR

Philippine cities have become more aware of the impacts of increased motorization to the environment. Cities now have sought to improve their transport systems towards achieving environment-friendly and disaster-resilient transport. Part of the initiatives in cities seeking to improve air quality and promote healthy lifestyles is the promotion of walking. This paper presents the application of a methodology developed by the Asian Development Bank to evaluate the walkability of cities. The methodology was applied to Tacloban City and walkability results were compared to other medium-sized cities in the Philippines. The obtained walkability scores for Tacloban City are particularly low in “amenities”, “disability infrastructure”, and “obstruction”. Overall walkability rating of the city is slightly lower than the average of other Asian cities. It was also observed that there is a lack of clear policies and political advocacy that cater to the needs of pedestrians (and non-motorized transport or NMT in general) in the City, which is similar to other Asian local cities

Keywords: Walkability, Cities

RESILIENCE ASSESSMENT OF FREIGHT TRANSPORT OPTIMIZATION PROGRAMS FOR THE PHILIPPINE GREATER CAPITAL REGION

Krister Ian Daniel ROQUEL, Alexis FILLONE and Krista Danielle YU

Critical to sustaining economic growth, logistics sprawl is a problem that needs to be addressed effectively and immediately, especially in developing countries. With the surplus of development programs but limited resources, there is a need to identify the optimum and sustainable direction to be taken, especially as the Philippines' exposure to the strongest typhoons makes it imperative to consider resilience. In this paper, resilience is measured and quantified using an Inoperability Input-Output model, where a disruption in freight transport operations (e.g. flooding) is taken as the initial perturbation. Using resilience as the primary metric, three freight development programs: a) Freight consolidation centers; b) Freight volume shift to outer ports; and c) Rail freight, and its various combinations were assessed. With the policy evaluation procedure undertaken, the interests of both the stakeholders and the community were covered.

Keywords: Logistics sprawl, Urban freight, Input-Output, Policy Evaluation

IMPACTS OF DIFFERENT RAINFALL INTENSITIES ON KEY TRAFFIC FLOW PARAMETERS AT NORTH LUZON EXPRESSWAY USING UNDERWOOD'S EXPONENTIAL MODEL

Hanzel N. MEJIA, and Ricardo DG. SIGUA

The study was conducted to establish a relationship about the effects of different rainfall intensities on key traffic stream parameters. Traffic data were gathered using loop detectors in NLEX for a period of seven months. Rainfall data were obtained from the nearest automatic weather station. Traffic data were segregated into different rainfall conditions: clear (0 mm rainfall/hr.), light (0.1-2.5 mm rainfall/hr.), moderate (2.6-7.5 mm rainfall/hr.), and heavy (above 7.5 mm rainfall/hr.). Regression analysis were done for speed-density and flow-density relationships using the exponential model by Underwood. The reduction in average speeds are about 5.34% under light rain conditions, 6.3% under moderate rain conditions, and 7.4% under heavy rain conditions. The average volume decreased by 2.92%, 10.62%, and 12.39% while the capacities reduced by 3.67%, 7.6%, and 17.44% under light, medium, and heavy rain conditions, respectively. Free flow speed and speed at capacity also decreased by 6.9-11.05% and 12.89-16.65%, respectively.

Keywords: Traffic flow, Rainfall, NLEx, Underwood's exponential model

ROAD CAPACITY IMBALANCE AT EXIT POINTS OF THE METRO MANILA SKYWAY AND ADJOINING ROADS

Daniel ANG, and Alexis M. FILLONE

Local roads have gradually been subjected to a great demand in vehicular transport in the past years as demand continues to increase while the road capacities stay the same. Some expressways contribute to the congestion in the local roads that are connected to its exit ramps. Local roads are unable to carry the high vehicular volume coming from the expressways. Because of this, some exit points of the expressways experience bottlenecks due to a high demand of vehicles exiting the expressway. Analysis of the exit points in the Metro Manila Skyway is needed to assess their current condition and to provide possible solutions to improve its worsening congestions. This study models the road traffic network to simulate the actual condition happening in the skyway. Mesoscopic modeling is used in analyzing the traffic flow and is used in formulating solutions to the congestion in the egress points of the skyway.

Keywords: Transportation, Expressway, Mesoscopic Modeling, Dynamic Traffic Assignment, Exit Ramps, Local Roads

FACTORS INFLUENCING MOTORCYCLE ACCIDENT SEVERITY IN COMMONWEALTH AVENUE, QUEZON CITY, PHILIPPINES

Girard Theodore BALMES II, Angelika Wynne TILLAS, John Michael ZAPANTA, Alben Rome BAGABALDO, and Francis Aldrine UY

This study evaluated the different factors affecting motorcycle accidents based on severity: property damage only (PDO), non-fatal injury, and fatal; determined the relationship of the time and year of accidents to the number of accidents occurred; and propose ways or methods in each factor to decrease motorcycle accidents severity in Commonwealth Avenue. Data were gathered from the year 2015-2017 records of the Metro Manila Development Authority (MMDA). By using one-way & two-way Analysis of Variance (ANOVA), relationship between different factors were determined. Results showed that there is a significant difference between the number of accidents to the year of accidents, and that the time of day and the years being considered is a factor in the number of accidents. Descriptive analysis showed that PDO has the highest percentage compared with fatal and nonfatal injury in terms of motorcycle accident severity.

Keywords: Motorcycle, Accident, Accident Severity, Traffic Congestion

MODE CHOICE ANALYSIS OF COMMUTERS IN INTRAMUROS, MANILA

Riches BACERO, André DEL ROSARIO, Nicanor ROXAS, Alexis FILLONE

Mode choice is a very important process in travel demand forecasting. It provides management or direction on the choices and behavior of the commuters based on the mode of transport available in a specific area like intramuros¸ Manila. This study analyzed the mode choice of the commuters in Intramuros, Manila with the use of nlogit model. At first, the data were gathered through interviews of the commuters who are randomly selected in the 5 entrance of Intramuros. Then the data were processed and used in the formulation of utility equation. Based on the result of the study, it was found out that variables which are significant to influence the choices of the commuters are the total time of travel, highest educational attainment, family gross monthly income, and waiting time. These variables would serve as a basis in planning and designing of the right transportation system in Intramuros, Manila.

Keywords: Mode Choice, Travel behavior, Travel time, Utility Function

JOINT MODEL OF PRIVATE PASSENGER VEHICLE TYPE OWNERSHIP AND FUEL CONSUMPTION IN METRO MANILA: ANALYSIS AND SIMULATION OF DISCRETE-CONTINUOUS CHOICE MODEL

Monorom RITH, Jose Bienvenido M. BIONA, Alexis M. FILLONE, Kenji DOI and Hiroto INOI

This study is aimed to identify micro-level determinants of the joint model for vehicle type ownership-cum-fuel consumption in Metro Manila. The developed model can be used to predict the mentioned output variables, vehicle kilometers traveled, and CO2 emissions based on various scenarios considered. Frank copula-based joint Multinomial Logit-Linear Regression model is implemented to build the joint model and analyze the sample data. Vehicles are categorized into two alternatives based on engine size: small car (≤2.0L) and large car (>2.0L). As evident from the empirical findings, an increase in gas price is the potential factors in reducing vehicular fuel consumption, vehicle usage, and CO2 emissions. The empirical results of this study is highly expected to be informative for policy makers in crafting intervention for road transport energy management, vehicular emissions, and the current traffic congestion.

Keywords: Frank copula, Discrete-continuous model, Vehicle ownership, Fuel consumption, Emissions

DETERMINING THE VALUE OF TIME FOR A PROPOSED EXPRESSWAY ALONG C-5

Gene Martin L. PIQUE, Alexis M. FILLONE and Nicanor R. ROXAS, Jr.

Metro Manila's congestion is indicative of the rising transportation demand in urban centers. In order to address this, the Metro Manila Integrated Transportation Study (MMUTIS) proposed the implementation of an expressway along Circumferential Road 5 (C-5). However, given the financial and economic risks involved in undertaking projects of this magnitude, an accurate estimation of Value of Time (VOT) is required in order to determine its viability. To obtain this, a binomial logit model was developed to forecast expressway demand and estimate road user value of time. A total of 672 responses were obtained through survey questionnaire which included socio-economic profile, trip characteristics and route choice components. Stated Preference was used to determine choice based from nine (9) scenarios of toll and time reduction. The developed model had a 65%forecasting accuracy with a 49.91% probability of C-5 private car users shifting to the expressway from their present routes. The calculated VOT was 121.67 pesos per hour supporting the viability of the expressway. However, VOTs were shown to vary from 47.81 pesos per hour to 266.38 pesos per hour depending on classification between trip characteristics, user profile and expressway usage.
Keywords: value of time, C5, expressway, discrete choice, route choice

FACTORS AFFECTING TRAVEL BEHAVIOR DURING FLOOD EVENTS IN METRO MANILA, PHILIPPINES

Raymund Paolo ABAD, Alexis FILLONE

This paper evaluates the influence of several factors that influence travel behavior of commuters whose trips were disrupted because of floods. Travelers may alter their travels in the form of a change in time of departure, mode or route is taken, or cancellation of the trip. Statistical tests revealed that civil status, employment type, possession and ownership of driver's license and vehicle, household characteristics, income levels, and the penalties associated with tardiness and early departure, influenced commuters' travel behavior. The paper highlights the other factors, aside from the characteristics of the flood, that may influence the behavior of travelers during their last trip that was disrupted by the flood. Penalties imposed to employees due to tardiness resulted in commuters shifting their departure times earlier. In contrast, commuters going home were not able to adjust their travels because of potential penalties. The findings in this paper also reflect the unreliability of public transportation services particularly during severe weather disturbances. Hence, a more resilient road-based public transport services to accommodate possible changes in travel behavior due to extreme weather events is suggested.
Keywords: flooding, Metro Manila, flexibility

MODE OF PUBLIC TRANSPORTATION IN COTABATO CITY

Dj Victor O. GALBIN, and Kathleen Mae B. ALUCILJA

A study on mode choice benefits engineers, transportation planners and policy makers to better understand the transportation system and forecast the future needs of the proposed transportation system of a city. This study focused on determining the available mode of public transportation in Cotabato City and the factors that influence the commuters' modal choice. Among the various identified mode of transportation available in the city, jeepneys and multicabs (local name for small version of jeepney) are the most frequently used public transportation from home as their point of origin to different destinations such as work/school, market, central business district and downtown. Socio-demographic, socio – economic profile of the commuters and factors such as accessibility, comfort and fare have influence in commuters modal choice of public transportation.

Keywords: Transport, mode choice, public transportation

OPERATIONAL CHARACTERIZATION OF HABAL-HABAL IN SELECTED MUNICIPALITIES IN NORTH COTABATO

Kathleen Mae B. ALUCILJA, Alexis M. FILLONE

Informal public transportation becomes popular in the Philippines because of its accessibility, faster and flexibility but is unregulated and has no policy for its operation. This study aimed to characterize habal-habal (the most common informal public transport in the province) service operation in Cotabato Province and aims to investigate the service type, route and schedules, fares, organizations/associations, service area and existing regulation policy. These informations will give a better understanding on the characteristics of this informal transport mode, and could serve as bases for future policies that will improve the habal-habal operation in the province. Most of the service area of habal habal are remotely located baranggays and the terminals are located at capital baranggay of each municipality and along the national highway. Habal habal becomes the main mode of transport for these baranggays since majority of these baranggays that has no other mode choice for public transport.

Keywords: Transport, habal habal, informal public transport

EXAMINING THE POTENTIAL SIGNIFICANCE OF INDUSTRY CONSOLIDATION AND FLEET MANAGEMENT IN IMPLEMENTING THE DOTR'S PUV MODERNIZATION PROGRAM: A CASE STUDY OF 1TEAM

Joemier D. PONTAWE, and Ma. Sheilah G. NAPALANG

This study examined the potential significance of requiring industry consolidation and fleet management in the successful implementation of the PUV Modernization Program by the Department of Transportation (DOTr) by presenting a case study of 1-Transport Equipment Aggregator and Management Inc. (1-TEAM), a fleet management company. Surveys and key informant interviews were conducted to carry out the study. Results revealed that industry consolidation and fleet management are both significant components of the DOTr PUV Modernization Program. Moreover, the financial viability of modernizing the current jeepneys would greatly depend on efficient management and operations of the brand new PUJs. Non-financial incentives and regulatory backstops may also help the government convince jeepney operators to participate in the modernization program.

Keywords: PUV Modernization, Fleet Management, Air Pollution, Road Safety, Jeepneys

NOTES

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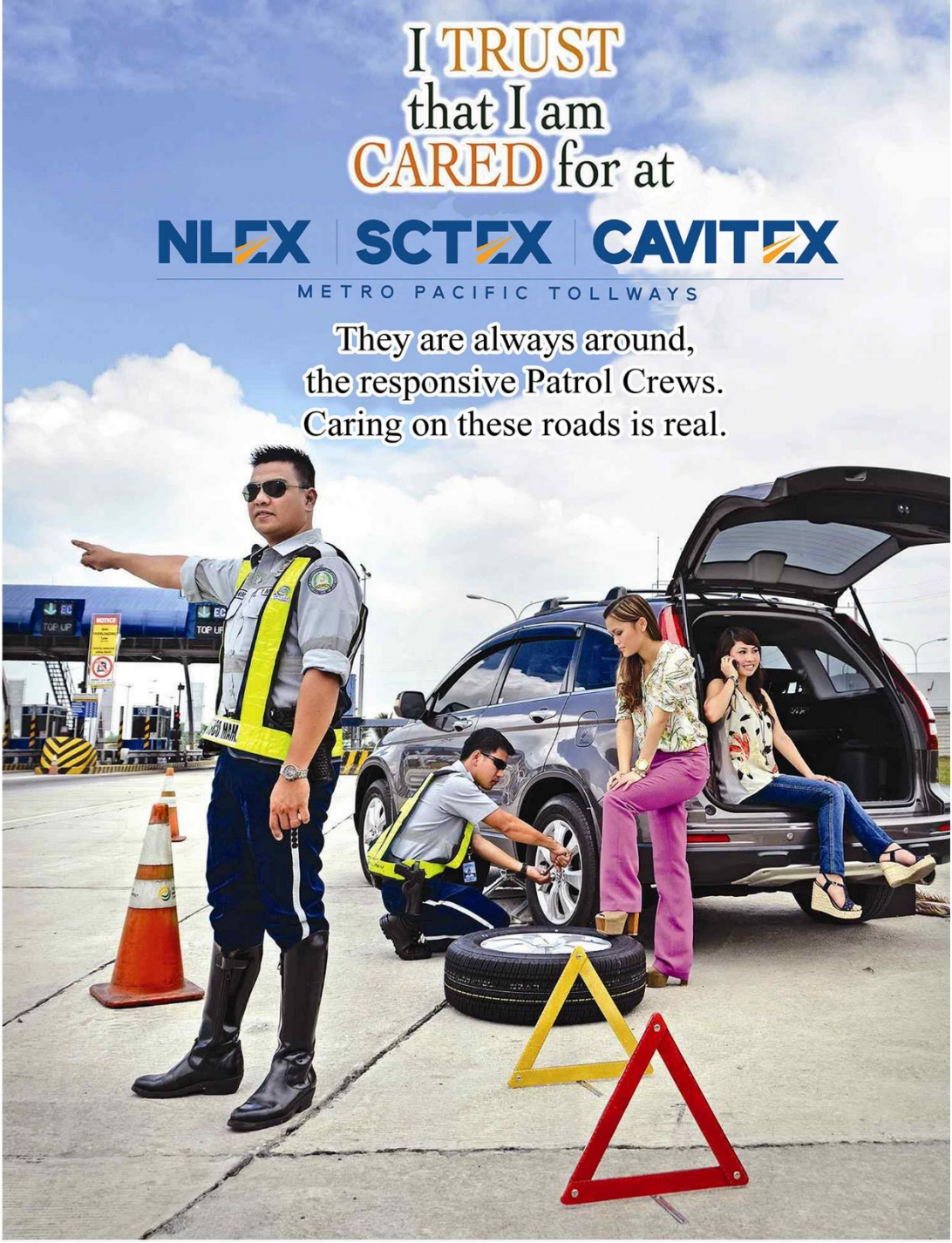

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