Acceptability of Electric Tricycle as a Public Transportation at Bonifacio Global City: Basis for its Implementation

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Abstract: The use of tricycle has become the mode of transportation in most developing cities of the world. Tricycle (motorized and non-motorized) is the prime mode of intra-city transportation. Public transportation performs a lot of functions for passengers. It enhances the quality of life in societies on condition that it provides safe, efficient and inexpensive transportation services. This study focused on the acceptability of electric tricycle as public transportation. It also aimed to answer all questions that may arise during the research. The opportunity of implementing electronic tricycle at Bonifacio Global City to local and foreign passengers can finally get rid of their phobia of the word "surge". They'll be able to commute more hassle-free since they will have less worry about the monstrous traffic and exorbitant parking fees just to move around the area. Moreover, they need not panic if they find out they don't have enough cash to commute. This is to lessen their daily cost of transportation and to allow them to move around the area in a more convenient way. The researcher used descriptive and quantitative type of research method. This method involves the collection of data in order to test the hypothesis and to answer questions concerning current status of the subject of the study. The researcher used a purposive sampling technique with the total number of 100 respondents. The researchers focused on the level of acceptability of electric tricycle as public transportation at Bonifacio Global City basis for its implementation. The research conducted shows that the acceptability of electric tricycle as public transportation in Bonifacio Global City is highly acceptable. The research shows that e-trike is convenient, safe to use as transportation, and can boost touristic experience in the city.

Keywords: transportation, safety, security, convenience, cost, eco-friendly, sustainable

INTRODUCTION

The growth of the ability and the need to transport large quantities of goods or numbers of people over long distances at high speeds in comfort and safety has been an index of civilization and in particular of technological progress.

E-Motor's goal is to provide a local alternative solution to transport that can help lessen our carbon footprint. We have to take responsibility for our environment by integrating as much as possible, the use of zero-emission vehicles in our businesses. E-Motors provide the solution for that need. E-Motors have been implemented in some parts of the country especially Metro Manila. The key cities consider the E-Motor as one of the solution in high rising number of passengers and traffic congestion. The study assess the acceptability of E-Tricycle, a form of E-Motor, as Public Transportation in Bonifacio Global City and to add touristic experience to key destination of the area.

Guillen et al [1] shows the use of tricycle has become the mode of transportation in most developing cities of the world. Tricycle (motorized and non-motorized) is the prime mode of intra-city transportation. Public transportation performs a lot of functions for passengers. It enhances the quality of life in societies on condition that it provides safe, efficient and inexpensive transportation services.

Balaria et al. [2] discuss that in the Philippines, electric tricycle or E-trike is the same as tricycle in terms of a configuration or almost as similar to that of the traditional rickshaw which is three-wheeled, and can ferry several passengers and dependent on the body design and capacity of the motor engine. E-trike is run by electricity while the latter is gas-fed, a typical design popular in the Philippines that is a sidecar which is attached to the side of a motorcycle for carrying passengers. It consists of parts such as windshields, dashboards, side mirrors and

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handlebars with body structure similar to "jeepneys". E-trikes can also load up to ten passengers including the driver and its design can be customized. Electronic tricycle reduces carbon dioxide emissions and minimizes air pollution. It also avoids excessive fuel consumption and reduces oil dependency, and eventually increase job opportunities and tricycle drivers' income in the long run. The researchers used the Routine Mode Choice of Decision by Van Acker with the following variables: Awareness and Availability, Safety and Security, Convenience and Cost, and Enjoyment. Availability allows tourists to analyse the different aspects in the adaption of E-trikes (electric tricycles) as a mode of public transport system replacing motorized tricycles in the city and awareness by which people must be aware of the mode and have it available as an option to travel to a destination.

Safety and security for an improved electronic tricycle design that provides a comfortable and safe riding experience for all tourists. Safety and security referred to as the electronic tricycles will have unique features compared to traditional trikes such as less maintenance, no noise and less vibration, and a maximum speed of 60 km/h that ensures safety for both passengers and drivers as well.

Convenience and cost means people ride tricycles primarily due to lack of alternative mode of transportation and convenience, giving the advantage of speed and cost.

Schneider [3] shows that enjoyment towards transportation is the ability of every tourist to interact with different mode of transportation, allow them to an enhanced experience and established that the level of security and safety in transportation systems. Transportation is the main mean to carry passengers, that is, brings the tourists to the actual site where tourism services are performed.

The unsatisfactory conditions of electric tricycle is that it has a poor electrical storage battery, the battery is now generally used, the average time is less than 6 hours while those of high-quality battery prices are too high which makes it contradictory, coupled with a new charging technology development, battery long charging time, and sometimes will delay use. Compared to other diesel vehicles, slow selections and limited in speed which is generally used for short rides but also professional manufacturers continued their constantly updated technology; strong support from a local governments department can also drag further development of electric tricycle industry moving it.

OBJECTIVES OF THE STUDY

This study focused on the acceptability of electric tricycle as public transportation. It also aimed to answer all questions that arose during the research. The objective of the tourist means of transportation is to address challenges and issues of current and future transportation, traffic demand, public safety, health, and social needs.

MATERIALS AND METHODS

The researchers used descriptive and quantitative type of research method. This method involves the collection of data in order to test the hypothesis and to answer questions concerning current status of the subject of the study. In relation to the study, this method was useful for the researchers because this is the most appropriate on the purpose of the researchers that is to gather data and information to answer the given specific questions. The research design that the researchers used is the quantitative. Quantitative requires quantifiable data involving numerical and statistical explanations. In relation to the study, this design was useful because the researchers used a scale from four to one (4-1) in the survey questionnaire in order to gather data and information. To achieve the sample size, the researchers used the purposive sampling technique. A purposive

sample is a non-probability sample that is selected based on characteristics of a population and the objective of the study. Crossman [4] states that purposive sampling is also known as judgmental, selective, or subjective sampling. This type of sampling can be very useful in situations when you need to reach a targeted sample quickly. The respondents were chosen on the basis of their experience and knowledge of the information desired: fifty (50) locals and fifty (50) foreign tourists from Bonifacio Global City.

The researcher formulated a survey questionnaire to gather essential data and information from the resident living and within the vicinity of the area. Data gathering procedures have been establish in the research paper in which the researcher printed-out her survey questionnaire, SOP, and requested for validation instrument, and was required for the validation process. The researcher submitted her request to the panelist that will validate the survey questionnaire. The researcher corrected those part of the survey questionnaire that the research professional advised to her. Lastly, the research questionnaire being approved by the adviser, the researcher went directly to Bonifacio Global City and proceeded to conduct a permission letter signed by the Barangay Captain.

RESULTS AND DISCUSSION

Table 1, the acceptability of electric tricycle as public transportation at Bonifacio Global City for both local and foreign tourists in terms of its awareness and availability is *highly acceptable* by the respondents with the weighted mean of 3.26.

Channels	Local	Foreign	Ave	VI
a. Electric tricycle provides availability as an				
alternative transportation	3.46	3.18	3.32	НА
b. Electric Tricycle keeps everyone to commute hassle freeamidst monstrous				
traffic	2.96	3.06	3.01	А
c. Electric Tricycle serves as an option to				
travel.	3.48	3.42	3.45	НА
d Electric Tricycle as a mode of public				
transport system				
replacing motorizetricycle in the city.	3.16	3.36	3.26	НА
Overall Weighted	2 27	2.26	2.26	ΤΤΛ
Mean	3.4/	3.20	3.20	пл

Table 1. Acceptability of Electric Tricycle in terms of Awareness and Availability

In addition to support this findings was the acceptability of awareness and availability answered by the respondents for each of the following questions: Electric tricycle provides availability as an alternative transportation is highly acceptable by the respondents with the weighted mean of 3.32; Electric tricycle keeps everyone to commute hassle-free about the monstrous traffic is acceptable by the respondents with the weighted mean of 3.01; Electric tricycle serves as an option to travel is highly acceptable by the respondents with the weighted mean of 3.45; Electric tricycle as a mode of public transport system replacing motorized tricycle in the city is highly acceptable by the respondents with the weighted mean of 3.26. Ilagan [5] shows that Bonifacio Global City residents and tenants can finally get rid of their phobia of the word 'surge'. They'll be able to sleep more soundly since they will have less worry about the monstrous traffic and exorbitant parking

fees just to move. Laurel [6] discussed that the E-motors, the Filipino makers of Zum electric tricycles, and supply chain company are working in unison to help spread awareness and to shed light on the issue of climate change in the country.

Table 2, the acceptability of electric tricycle as public transportation at Bonifacio Global City in both local and foreign tourists in terms of safety and security is highly acceptable by the respondents with the weighted mean of 3.53.

Channels	Local	Foreign	Ave	VI
a. E-trike contributeto both the economical and physical health of individuals.	3.36	3.62	3.49	НА
b. E-trike design provides comfortable and safe ridingexperience.	3.32	3.48	3.40	НА
C. Promotes safetyand eco-friendly means of public transportation.	3.62	3.64	3.63	НА
d. Unique features of e-trike such as nonoise and less vibration.	3.60	3.58	3.59	НА
Overall Weighted Mean	3.48	3.58	3.53	НА

Table 2. Acceptability of Electric Tricycle in terms of Safety and Security

Furthermore to support this findings was the acceptability of safety and security answered by the respondents for each of the following questions: E-trikes contribute to both the economical and physical health of individuals is *highly acceptable* by the respondents with the weighted mean of 3.49; E-trike design provides a comfortable and safe riding experience is *highly acceptable* by the respondents with the weighted mean of 3.49; E-trike design provides a comfortable and safe riding experience is *highly acceptable* by the respondents with the weighted mean of 3.4; Promotes safety and eco-friendly means of public transportation is *highly acceptable* by the respondents with the weighted mean of 3.63; Unique features of e-trike such as no noise and less vibration is highly acceptable by the respondents with the weighted mean of 3.59. Bagumparan [7] cited that in Marawi City, Lanao Del Sur, like any other vehicles, electric vehicles (e-trikes) also have safety features to protect the driverand its passengers, when on the road.

Table 1.3, the acceptability of electric tricycle as public transportation at Bonifacio Global City in both local and foreign tourists in terms of its convenience and cost is *highly acceptable* by the respondents with theweighted mean of 3.3.

Table 3. Acceptability of Electric Tricycle in terms of Convenience and Cost

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Channels	Local	Foreign	Ave	VI
a. Hassle-free from				
the traffic withincongested areas	3.14	3.14	3.14	А
0				
b. The experience is				
convenient with low cost fare of				
transportation lesser than the usual public3	.38	3.48	3.43	НА
transit.				
c. The e-trike as a				
low cost investment vehicle (Ranging from3	.16	3.16	3.16	А
Php 250,000 to Php 350,000 pesos)				
d.Affordable mobility				
for both commuter and tourist (Ranging from3	.40	3.48	3.44	НА
Php 10-Php 20				
pesos per person).				
Overall Weighted 3	.27	3.32	3.30	НА
Mean				

In addition to support this findings was the acceptability of convenience and cost answered by the respondents for each of the following questions: Hassle-free from the traffic within congested areas is acceptable by the respondents with the weighted mean of 3.14 The experience is convenient with low cost fare of transportation lesser than the usual public transit is highly acceptable by the respondents with the weighted mean of 3.43. The e-trike as a low-cost investment vehicle is acceptable by the respondents with the weighted mean of 3.16; Affordable mobility for both commuters and tourists is highly acceptable by the respondents with the weighted mean of 3.44. Kouwenhoven [8] states that "Convenience is one of the strongest attractions of the private car for passenger transport. For users of public transport, convenience is also clearly important but not always clearly defined and not often measured in designing transport systems or monitoring their operating performance. In many situations, an increase in public transport convenience reduces the unit costs of travel (euros/dollars per hour or cents per minute) and so provides benefits equivalent to an increase in travel speed. This report focuses on convenience and its importance to the user experience."

Table 1.4, the acceptability of electric tricycle as public transportation at Bonifacio Global City in both local and foreign tourists in terms of enjoyment is highly acceptable by the respondents with the weighted mean of 3.46.

Channels	Local	Foreign	Ave	VI	
a. The e-trike will contribute or compliment	t				
the					
touristic experience of a visitor.	3.34	3.56	3.45	HA	
h. E. tuiko muorridosoniorremont and					
b. E-trike providesenjoyment and	2 50	2 40	2 45	TTA	
excitement.	5.50	3.40	3.43	HA	
c. The tourists may					
enjoy unforgettableexperience.	3.38	3.44	3.41	НА	
d. E-trike gives more					
happiness and					
satisfaction rather	3.48	3.56	3.52	HA	
than other					
transportation by bringing to the actual site.					
Overall Weighted	3.42	3.49	3.46	HA	
Mean					

Table 4. Acceptability of Electric Tricycle in terms of Enjoyment

To support this finding was the acceptability of e-trike in terms of enjoyment answered by the respondents for each of the following questions: The E-trike will contribute or compliment the touristic experience of a visitor is highly acceptable by the respondents with the weighted mean of 3.45; E-trike provides enjoyment and excitement is highly acceptable by the respondents with the weighted mean of 3.45; The tourists may enjoy unforgettable experience is highly acceptable by the respondents with the weighted mean of 3.41; Electric tricycle gives more happiness and satisfaction rather than other public transportation by bringing to the actual site is highly acceptable by the respondents. Through different mode of transportation tourist may find it exciting and unforgettable experience.

Average Weighted Mean in terms of awareness and availability, safety and security, convenience and cost, and enjoyment between the two groups of respondents.

Channels	Local	Foreign	Ave	VI
1. Awareness and Availability	3.27	3.26	3.26	НА
2. Safety and Security	3.48	3.58	3.53	НА
3. Convenience and Cost	3.27	3.32	3.30	НА
4. Enjoyment	3.42	3.49	3.46	HA
Overall Weighted Mean	3.36	3.41	3.39	НА

Table 5. Average Weighted Mean in terms of Awareness and Availability, Safety and Security, Convenience and Cost, and Enjoyment between the Two Groups of Respondents

To support this findings, the average weighted mean was 3.39 which interpreted as highly acceptable in the acceptability of electric tricycle as a public transportation answered by the local and foreign respondents in terms of: awareness and availability with the total weighted mean of 3.26 as highly acceptable which was the lowest average weighted mean; safety and security as 3.53 interpreted as highly acceptable which was the highest average weighted mean; for the convenience and cost with the total weighted mean of 3.30 interpreted as highly acceptable; and enjoyment was 3.46 interpreted also as highly acceptable.

Saif et al states that torok in 2016 states that the accessibility is one of the most important outcomes of the transportation system. Public transport can be more attractive by providing "Door to door mobility" and development of transportation services is an important factor of social quality. Public transport accessibility has gained vital importance in designing and evaluating the transit system in terms of mobility and sustainability. Apart from the transport system itself, public transport accessibility has the considerable impact on life satisfaction in the form of perceived accessibility.

CONCLUSION AND RECOMMENDATION

This study focused on the acceptability of electric tricycle as public transportation. It also aimed to answer all questions that arose during the research. The objective of the tourist means of transportation is to address challenges and issues of current and future transportation, traffic demand, public safety, health, and social needs. The researchers conclude that electric tricycle adaptation and implementation were basically the advantages of this new trend, unique features and improved designs that would greatly benefit the community. These kinds of development or technological innovation are becoming vast to the transportation industry and many studies were conducted on different innovations for such a long time in the industry. The growth of transportation industry includes various services and plays important role in an efficient and equitable transport system by providing affordable basic mobility for non-drivers and efficient urban travel. Persons/individuals, commuters or driver-operators, local and foreign considering public transportation on the basis of certain variables that they define, such as awareness and availability, safety and security, convenience and cost. In addition, the researchers drawn from the study that enjoyment was also one of the factors that determine the acceptability of electric tricycle.

The researchers conclude that the majority of the local respondents are between 18-25 years of old, male, single at Bonifacio Global City and with the average weighted mean of 3.36, interpreted as 'highly acceptable' in terms of awareness and availability, safety and security, convenience and cost, and enjoyment. The researchers conclude that the majority of Bonifacio Global City (BGC) foreign respondents are between 36 to 45 years old, female, married and with the average weighted mean of 3.41, interpreted as 'highly acceptable' in terms of avareness and availability, safety and security, convenience and cost, and enjoyment.

The Level of Acceptability of electric tricycle in terms of awareness and availability was that it provides availability as an alternative transportation rated as highly acceptable. The electric tricycle keeps everyone to commute hasslefree about the monstrous traffic rated as acceptable. And rated as highly acceptable, the electric tricycle serves as an option to travel. And the electric tricycle as a mode of public transport system replacing motorized tricycle in the city was also rated as highly acceptable. The overall rate for awareness and availability was highly acceptable. In terms of safety and security, the level of acceptability of electric to both economical and physical health of individuals was highly acceptable. E-trikes design provides a comfortable and safe riding experience rated as highly acceptable; promotes safety and eco-friendly means of public transportation also rated as highly acceptable and the unique features of e-trike such as no noise and less vibration was highly acceptable.

The total average evaluation to the level of acceptability of electric tricycle to the respondents in terms of convenience and cost was rated as highly acceptable. According to the respondents, hassle-free travel within congested areas was rated as acceptable. The experience is convenient with low cost fare of transportation lesser than the usual public transit was highly acceptable. The respondents also found e-trike as a low-cost investment vehicle (ranging from 250,000 to 350,000 Pesos) was also rated as acceptable; affordable mobility for both commuters and tourists (ranging from 10 to 20 Pesos per person) was rated as highly acceptable.

In terms of enjoyment as one of the main factors to consider in the acceptability of electric tricycle was rated as highly acceptable. According to the respondents, e-trike will contribute or compliment to the touristic experience of a visitor resulted to highly acceptable. E-trikes provide enjoyment and excitement was also rated as highly acceptable; the tourists may enjoy unforgettable experience rated as highly acceptable and lastly, for the statement that electric tricycle gives more happiness and satisfaction rather than other public transportation by bringing to the actual site resulted also to highly acceptable.

To the Department of Transportation and Communications (DOTC): Should continue to provide guidelines in acquiring electric tricycle in the country as a form of public transportation. The DOTC may establish a meeting with other government units in line with the transportation system of the country to introduce the acceptability of electric tricycle not just in the cities but provinces as well.

To the Land Transportation Offices (LTO): To include the electric tricycle in the inspection and registration of motor vehicles to consider e-trike as a means of public transportation vehicle. Issue a license and permits for allowing e-trike to be an option of public transportation at Bonifacio Global City.

To the local government of Taguig City: They should work together with the Barangay Fort Bonifacio on how to maximize the proper and optimal use of e-trikes and shall also be working with the DOTC in the preparation for appropriate utilization of electric tricycle. To gather a meeting together with City Mayor Hon. Edgardo Lino Cayetano and the Department of Transportation and Communication on the implementation of electric tricycles at Bonifacio Global City as an alternative means of transportation for Taguigenos as well as the tourists.

To the Barangay of Fort Bonifacio: Should implement an ordinance for e-trike acceptability in a proper coordination with the local government of Taguig, and participation of the DOTC and LTO. The barangay should provide policies, rules and regulations by replacing the entire public motorized vehicle in the area by using electric tricycle and limit the entering of some public vehicles to minimize traffic congestion.

To the transportation sector of Bonifacio Global City: They should start investing on electric tricycle to support its possible adaptation. They must follow the agreement about the rules and regulations provided by the LTO and the DOTC.

This study is limited in several aspects. The study is limited to the following scope such as this study focused on the level of acceptability of electric tricycle as public transportation at Bonifacio Global City basis for its implementation. This research is conducted from January to October 2019 focusing to the local and foreign of Bonifacio Global City. It only assess how acceptable the electric tricycle as a form of public transportation in Bonifacio Global City. Future studies may continue to explore such as the implication of the electric tricycle to other public transportation vehicle and inclusion of traffic as part of the variables or specific course of action. This study included the local and foreign of those are particularly within the vicinity of Bonifacio Global City during the time of survey. Furthermore, this study is also limited to electric tricycle (e- trike) as the public mode of transportation to the total of fifty (50) locals and fifty (50) foreign.

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