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Policy Implications of Incorporating E-Jeepney in Public Transport Systems: Lessons from Valenzuela City, Philippines

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Abstract—This paper examines the feasibility of implementing E-jeepneys as an alternative mode of transportation in Valenzuela City, a leading city in the Philippines known for its sustainability, infrastructure development, and innovative programs. Jeepneys are the most commonly used mode of public transportation in the country, with around 1,500 registered traditional jeepneys in Valenzuela City providing a livelihood for approximately 1,000 families. However, the jeepney industry in Metro Manila is becoming increasingly competitive due to the introduction of cheaper and more modernized models. To address this issue, this study utilizes sustainable development as a conceptual framework to evaluate the economic and socio-political aspects of implementing e-jeepneys under the Public Utility Vehicle Modernization Program (PUVMP). The paper presents the findings of a survey conducted among jeepney driver-operators regarding their willingness to undergo jeepney modernization. The survey results revealed that a majority of respondents were open to the idea, citing economic benefits, improved vehicle performance, and government support as primary reasons. Moreover, the local government officials in Valenzuela City expressed support for the implementation of e-jeepneys, citing their potential to address issues such as air pollution, traffic congestion, and energy efficiency, among others. The paper concludes by recommending the adoption of e-jeepneys as an effective and sustainable alternative to traditional jeepneys in Valenzuela City. The study provides insights and recommendations that can guide policymakers and stakeholders in implementing sustainable transportation solutions in the Philippines. Overall, this study contributes to the body of scholarly literature on sustainable transportation and provides valuable insights into the integration of sustainable development principles in transportation planning.

***Index Terms*—Jeepney, Public Transport Innovation, Transport Modernization, Transportation Sustainability, Valenzuela City.**

1. The Problem and its Background

A. Introduction

One thing that the Philippines is characterized with, by all means, are streets full of life. Traditional jeepneys, a familiar means of transport for Filipinos, dominate the mentioned streets. Updated from the dilapidated U.S Army Jeeps, these iconic vehicles were a contributing member in developing the history, culture, and transportation system of a country. With their colorful exteriors and complex designs, traditional jeepneys are featured as a favored means of public transportation because of its affordability and being typical in nature (Andalecio, et al., 2019). Such vehicles can carry up to 20 commuters or more, goods, and sometimes both depending on purpose and are known for their low fee charges and high mobility in congested roads. Nevertheless, the conventional jeepney system has been criticized due to prolonged use of traditional engines that emanate harmful emissions and undesirable effect on the transport system in the Philippines. Therefore, a new movement of modernization surfaced. These so called electric jeepneys or E-jeepneys pinpoints the possibility of a more sustainable transportation solution.

Considerably, due to technical improvements, electric jeepneys or E- jeepneys can be described as an innovation that have a lot to offer compared with their traditional counterparts. This project is a part of the Public Utility Modernization Program (PUVMP) which was initiated by the Department of Transportation (DOT) in 2017. Its goal is to reduce jeepney transportation sustainability issues caused by diesel-fueled jeepneys.

Other than the fact that they run on rechargeable batteries, electric jeepneys ensure the elimination of direct emissions and reduce carbon footprint related to transport. Additionally, it seeks to provide efficient and expeditious rides and relieved reliance on fossil fuels. Under this system reform, the Government of Valenzuela introduced COMET-3—an electrostatic public transport vehicle that is chargeable within half an hour and powered by lithium- ion batteries—last 2018 (Porciuncula, 2019). The vehicle's use would represent the city's participation in one of the most current public transportation system reforms in the Philippines.

To understand the sustainability of PUVMP, researchers embarked on a research study. As discussed earlier, jeepneys were contributing factors for Philippines' public transportation system. They affect every citizen's quality of life especially those who use roadways with limited mobility and individuals seeking employment as operators. Upon processing the detailed aspects of jeepney modernization program, the researchers were able to formulate conclusions and recommendations that

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are useful in future research studies or policy-making. In addition, various agencies at the national level, like the Department of Transportation (DOT) and the Land Transportation Franchising and Regulatory Board (LTFRB, can use this study to develop their services regarding quality public transportation. This study allowed citizens, especially the jeepney operators and their passengers, to put their experiences and perceptions regarding such program into account. The research emphasized on the socio- political influence of the program rather than its environmental impacts. Acquiring a deeper knowledge of the program's socio-political impact was prioritized in the study. Appropriate data-gathering were utilized to obtain the necessary data. Such data were analyzed, were used to form conclusions about the program's effectiveness and became a basis for recommendations regarding the program.

B. Background of the Study

Many Filipinos also view the jeepney as a cultural symbol, therefore modernizing this industry has been challenging. In expansion, the modernization program will execute benchmarks to maximize the benefits of cutting-edge jeepneys over the nation. (Cruz, 2017). The City Government of Valenzuela is committed to working closely with the transport groups and other stakeholders to ensure a smooth and safe transition to the modernized jeepneys. The local Government Unit of Valenzuela hopes that this partnership will provide a better transport system for the citizens of Valenzuela and contribute to the overall development of the city (Flores, 2023).

Due to the General Community Quarantine (GCQ) declaration and the traditional jeepney phaseout appeared to be in danger due to the COVID-19 pandemic, Valenzuela City ensures that the City Government understands the struggles of the displaced jeepney drivers and will gladly assist their respective Jeepney Operators and Drivers Association (JODA) in applying for the jeepney modernization program. Though shifting one's viewpoint on modernization is never simple, Valenzuela City makes sure that JODA are not currently suffering from the prolonged effects of the quarantine period on their livelihoods, jeepney drivers are allies in helping "move" people and goods, which plays an undeniable and crucial role in boosting the economy (Samonte, 2019).

According to Aguarino and Porciuncula (2020), three functioning transport cooperatives have already submitted applications for the PUV modernization loan program as of January 2020. The cooperatives Metro Valenzuela Transport Service Cooperative, Inc. (METROVAL), which has 17 units, Malinta Jeepney Transport Service Cooperative (MJTSC), which has 23 units now, and Metro Valenzuela Transport Service Cooperative, Inc. (MJTSC), which will turn over 29 more units this year, were each given bank financing through the Land Bank of the Philippines (LBP) and the Development Bank of the Philippines (DBP). One of the 23 updated jeepneys that began operating the route through Valenzuela City in 2019. The Duterte administration's Public Utility Vehicle Modernization Program includes contemporary jeepneys.

The Duterte administration has prioritized the Public Utility Vehicle Modernization Program (PUVMP) with the objective of supplanting 85,000 more seasoned jeepneys with more up-to-date and more effective models by 2020. To assist with this, the Arrive Bank of the Philippines is advertising a delicate credit to pay for the buying of an unused jeepney, and the Land Transportation

Franchising and Regulatory Board (LTFRB) is additionally advertising an appropriation of up to P168,000 per vehicle. After all, jeepneys are an imperative component of the Philippines' open transportation framework since of their adaptable courses and less costly passages than taxis, trains, or motorized tricycles. Be that as it may, conventional jeepneys are considered perilous and destructive to the environment by the LTFRB.

The Jeepney Modernization Program (JMP) was first introduced in 2017, through the Executive Order 125-A and Administrative Order 202, s. 1987 by Arthur Tugade, the former secretary of the Department of Transportation. The department order authorizes and promotes safe, efficient, and environmentally friendly Public Utility Vehicles (PUVs). As for Public Utility Jeepneys (PUJs) and Utility Vehicle (UV) Express, it shall comprise all the demands stated. The transport operators in PUVMP that are most impacted by the destabilizing processes are those that do not have the financial resources to modernize their fleet. Transportation groups are the ones that oppose the jeepney modernization initiative the most actively (Sunio et al. 2019). According to them, the PUVMP's main goal is to phase out outdated jeepneys, which would result in the unemployment of thousands of jeepney operators and drivers nationwide, however it will meet the government's standards on emissions, safety features, and accessibility. The government offers financial assistance to operators through loans and subsidies and aims to complete the modernization of all jeepneys.

The Jeepney Modernization Initiative offers society and the transportation sector a number of opportunities. The initiative might result in the creation of a more effective and environmentally friendly transportation system. Also, it will lessen pollution and improve commuter safety. The initiative can open doors for brand-new firms and sectors. More jobs will be available due to the new jeepneys' production and upkeep. On the other hand, jeepney modernization is a challenging subject that requires juggling the demands of society, the environment, and the transportation sector. Jeepney operators and drivers face difficulties as a result of the Jeepney Modernization Program, which offers prospects for a more sustainable and effective transportation system. Collaboration between the government and key industrial players is crucial. This will guarantee that the program is put into action in a way that is advantageous to everyone (Mendoza,2020).

C. Statement of the Problem

This study entitled "*Policy Implications of Incorporating E-jeepneys in Public Transport Systems: Lessons from Valenzuela City, Philippines"* aims to provide valuable guidance for policymakers on formulating effective policies for integrating E-Jeepneys into Public Transport Systems. This study will

answer the following;

1. How does the local government of Valenzuela implement the Public Transportation Modernization System?
2. What are the problems and challenges identified by the local government in regard to the implementation of the program?
3. What are the views and experiences of the residents of Valenzuela, particularly the jeepney drivers towards the implementation of the Public Transportation Modernization System?
4. Based on the findings of the study, what recommendations can be developed towards the sustainability of the Public Transportation System at the local level?

D. Theoretical Framework

Theoretical Frameworks are used in data collection and analysis since they offer a set of concepts and relations which could be used to understand the intended phenomena (Creswell, 2015). The study utilized the Policy Implementation Theory that focused on the factors and strategies affecting implementation of policies. Thus, formulating a model that could be analyzed through challenges or outcomes of implementation process in Valenzuela City.

In addressing Valenzuela City's E-jeepney policy, stakeholders, such as local communities, government agencies and transport companies, are involved. As observed by Howlett, Michael and M. Ramesh (2015), policy urbanization follows numerous stages and involves multiple players. Whereas, a satisfactory implementation of policies requires the highest coordination and cooperation among these stakeholders. One of the major influences on policy implementation is resource allocation. One needs to establish the possibility for Valenzuela City's adoption of e-jeepneys by allocating financial and logistic resources. This, according to Bryson (2015), is a vital process in the policy implementation. It is critical that adequate resources are available to support the implementation of policy and allocated in an economical manner.

Another integral element of policy implementation is stakeholder's involvement. As per the World Bank (2015), it is important to engage stakeholders in policy-making, as this enhances legitimacy, effectiveness and sustainability of policies. Stakeholders can provide useful inputs on the challenges to be addressed, possible solutions and likely outcomes from various policy alternatives. They can as well work to get support and get consensus of a policy which makes implementation an easier task. The importance of capacity building cannot be overemphasized for the successful implementation of policies. The Valenzuela City ought to support the training and skills- development of the e-jeepney drivers and maintenance staff. The capacity of the implementers is one of the major determinants of policy implementation. Implementers are able to overcome implementation barriers and achieve policy objectives when they have the necessary knowledge, skills and resources, as stated by the OECD. (2017). Your study can identify best practices and what can be enhanced related to developing the skills and knowledge of the main stakeholders that are involved in implementing the e-jeepney policy by discovering the capacity-building measures being done in Valenzuela City. For policy implementation most especially in multi-level governance situation like Valenzuela City, intergovernmental relations are essential. Good policy implementation demands the harmonization of stakeholders outside government agencies such as the private sector and civil society organizations (Börzel and Howarth, 2020). This research revealed possible difficulties linked to cooperation and coordination among different government institutions were analyzed by looking into the intergovernmental relationships related to Valenzuela City's e-jeepney policy. Using Policy Implementation Theory, one can view the integration of e-jeepneys in the city of Valenzuela's public transportation system as a problem. What it revealed from this study was ways of redesigning the policy implications of the e-jeepney in the context of public administration, by focusing on aspects like resource distribution, stakeholder involvement, capacity building and intergovernmental connections.

E. Conceptual Framework

This research adopted the Sustainable Development Concept as a framework for the analysis of the sustainability of modern jeepneys or E-Jeepney as a substitute to traditional jeepneys. The ability of the present generation to meet their needs without jeopardizing the needs of the incoming generations explains the concept of sustainable development. Sustainable development is a holistic approach to development that aims to meet the needs of the present without compromising the ability of future generations to meet their own needs.

It is based on three pillars: economic sustainability, environmental sustainability, and social sustainability (United Nations Development Programme, 2015).

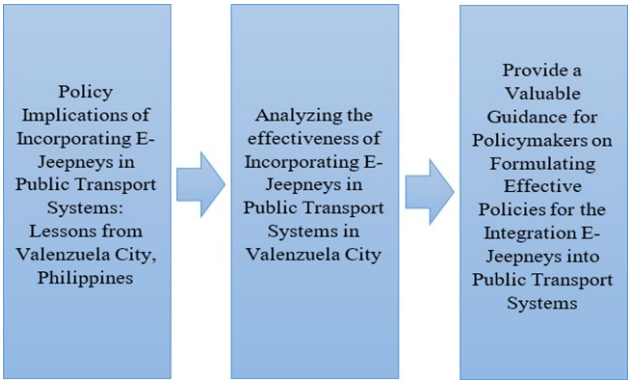

Fig. 1. Research paradigm

The study is designed to explore policy implications of incorporating electric jeepneys in Valenzuela City. The conceptual framework focuses on evaluating the EJeepney's effectiveness in its implementation and offer dignifying policy advice for policymakers when formulating policies to aid integration.

Defining its Input, this study focuses on the title of research. In terms of Politics, it shows policy implications in E-Jeepneys' usage to jeopardize immediate infringement after incorporation

and regulations or their aspects prior each facet towards backgrounds comprehensible subjugated answers Feteris (2016). The procedure includes assessment of the efficacy in integrating E- Jeepneys to public transport systems of Valenzuela City. This activity will also most probably comprise data collection, the use of surveys that may be conducted on passengers or households and other key informants who are in an ideal position to show system benefits as well use E-Jeepneys evaluation formula where the yearly costs between rolling out eco vehicles versus conventional modes are computed for purpose.

The result that the study is seeking to provide are suggestive prescription for decision-makers. Observation and analysis of the study will enable people to understand how E-Jeepneys are functioning in terms of efficiency in public transport systems. Building on these findings, the study intends to facilitate policymakers in Valenzuela City with targeted recommendations and insights that can help them formulate regulations for efficient integration of E-Jeepneys. The above policy recommendations may address the topics of infrastructure upgrades, regulatory frameworks, financial incentives and engagement levels.

The main intention of the conceptual framework for research is to fill in between stage from policymakers who has the decision-making process and consequences that can be outlined by adoption E-Jeepneys. The research has the goal of facilitating policy making by decision makers in Valenzuela City, Philippines to develop policies that can assist easy integration and thereby engross E-Jeepneys in public transport systems based on evidence.

F. Scope and Delimitation of the Study

The study required the participation of E-jeepney operators, E-jeepney drivers, and commuters residing in Valenzuela City. Its aim was to assess the sustainability of E-jeepneys as an alternative mode of public transportation. Furthermore, the research was limited only to the aforementioned groups in Valenzuela City.

The result of the study was not generalized and applied to a different context of the community since the calculations and recommendations focused on the responses provided by E-jeepney operators, E-jeepney drivers, and commuters alone. The data, acquired by the researchers, concerned the sustainability of E-jeepneys towards the welfare of Valenzuela citizens only; It did not conclude the overall sustainability posed by E-jeepneys to the entirety of the Philippines.

G. Significance of the Study

This part of the research paper will provide insights on what and to whom this paper might be beneficial.

Educational Institutions - The results will also provide the schools with information gathered by the researchers about the potential advantages and benefits of e-jeepneys as the primary mode of transportation.

Operators - The information in this paper will help them to be considerate and mindful of investing in e-jeepney rather than traditional ones to cater to daily commuters.

Community - This research will contribute to the betterment of the community because it will contribute to the study of E-jeepneys as the primary mode of transportation and it will be expected to reduce air pollution, as they are designed to meet the government's emission standards. The study could create opportunities for new businesses and industries. Manufacturing and maintenance of the new jeepneys will create more job opportunities.

Drivers - The outcome of the study will provide the drivers with significant information regarding e-jeepney and how it will serve its function and duties as a modernized mode of transportation among Valenzuelanos.

Commuters - The data of this study will help them to be knowledgeable about more convenient public transportation due to the various modernized features of e-jeepneys including air conditioning, GPS tracking, automated fare collection, and increased safety for commuters.

H. Definition of Terms

Government - The political system by which a country or community is administered and regulated (Brogan, 2023). *Refers to the political structure that has the authority to approve the use of e-jeepney as the primary mode of transportation.*

Modernization - The transformation from a traditional, rural, agrarian society to a secular, urban, industrial society (Kumar, 2023). *Refers to the process of modernizing traditional jeepneys to create e-jeepneys to keep up with the changing needs of society.*

Public Transportation - It is a local means of transportation that makes it possible for more individuals to travel together along predetermined routes (Industry Insight, 2021). *Serves as a method of transportation that is the focus of the study by substituting an e-jeep for a traditional one.*

Sustainability - Refers to the capacity to continue to sustain or maintain a process throughout time (Mollenkamp, 2016). *The capacity of Valenzuela's municipal government to sustain the cost and demand of using e-jeepneys as the primary mode of transportation.*

Jeepney - A vehicle that serves as an accessible form of public transportation in the Philippines. It was initially built from WWII-era American military jeeps and is well-known for its colorful decoration and crowded seating (Escalona, 2017). *Refers to both conventional and modernized modes of transportation.*

2. Review of Related Literature and Studies

A. Public Transportation Modernization Program Implementation

Jeepneys are crucial vehicles of transportation to Filipinos, especially students and low-income workers. They serve as a source of income to thousands of independent operators. Unfortunately, the extended use of the vehicle produced environmental and safety concerns because of its inflated emissions production and outdated design. Transport groups are concerned that the Public Utility Vehicle Modernization Program (PUVMP) may force some independent operators into

a monopolized debt trap due to consolidation and the high cost of upgraded jeepneys.

The PUVMP aims to modernize and unify the fragmented Public Utility Vehicle (PUV) Industry and to upgrade or replace PUVs that are older than 15 years to comply with environmental and safety standards. PUV operators must consolidate into either a transport corporation or cooperative by being part of an established entity or creating a new one with at least 15 PUV operators to continue running their operations.

Sunio, et al. (2019) have manifested that in the developing countries, a large fraction of the population resorts to the usage of informal transport system such as that provided by small entrepreneurs. The informal transportation industry in the Philippines featured in the case study applied in this work is highly fragmented and individualized, which has led to a high number of single operators competing for a bigger share of the market on the streets. Due to this sector's multi-actor character, managing for goal-oriented transition is not an easy burden. Therefore, the speed of socio-technical transitions of transport systems, including informal sector, is usually slow, long and protracted, taking decades to centuries to occur. Using the ongoing Public Utility Vehicle Modernization Program (PUVMP) as a case study, we expound on the governance styles of the State in reforming the various subsystems that make up the complex informal transport sector of a developing country, the Philippines. The PUVMP is dubbed as the biggest non-infrastructure public transport reform project by the current Philippine government. Due to this, the pace of socio- technical revolutions in the transportation industry, particularly the informal transportation sector, can be slow, prolonged, and lengthy, frequently requiring decades to centuries.

The current reform initiative, started and carried out by the national government, intends to completely transform the Philippines' public land transportation sector. PUVMP is a central government actor's "transition experiment" (c.f. van den Bosch, 2010) in the transportation industry. The lack of transportation literature on socio-technical transformations was observed by Rosete (2022). A systems perspective is consequently required to facilitate transition or reform due to the complexity of modern mobility and the lack of jeepneys in these countries, an innovation of a public transportation system after World War II. In the case of the Philippines, the current system relies excessively on private sector initiative to provide public transportation services. An individual or cooperative that recognizes a potential and requests a franchise from the LTFRB runs the jeepney that is rented to drivers.

Prior to the start of the COVID-19 Pandemic, two key documents were created to serve as the foundation for the government's current transportation modernization strategy. The first is a report from JICA and the National Economic Development Authority (NEDA) that discusses the overall plan for the development of transportation in Metro Manila and the surrounding regions of Central Luzon and CALABARZON. In order to effectively manage urban growth in Metro Manila, it was meant to serve as a roadmap for the short-term and medium-term transport investment objectives. [JICA 2014]. The Department of Transportation (DOTr) also released a study on the modernization strategy for the jeepney sector. In contrast, the DOTr's plan to modernize jeepneys seeks to create a modern, environmentally friendly, and climate-conscious road-based public transportation system that will fleet to realize short- and medium-term mitigation effects, complement the existing improvements in the mass public transportation system, and limit the motorization trend of the country. The implementation of joint fleet management, franchise consolidation and reform, reorganization of public transportation planning and regulation, and use of technology to manage public transportation operations are only a few examples of structural developments in the industry. By imposing an age restriction and vehicle specifications for jeepneys as well as by introducing financial incentives, the existing fleet will be upgraded to greater capacity vehicles (Malasique, 2022).

In accordance with Herrera, et al.'s study from 2019, improving the local Philippine jeepney business is intended to build the groundwork for changes of the public transportation system and to reroute the present motorization trend given its explosive expansion over the previous 10 years. Although the national government and local government units have other plans to reform the public transportation system, a focus on the road-based public transportation market is crucial to achieve short- and mid-term mitigation effects, in addition to long-term improvements in mass public transportation aimed at further reducing the country's motorization (GIZ, 2016). Essentially, capitalization remains a significant obstacle to adoption even if modernization has the potential to raise farebox revenues, improve commercial performance, and lower long-term operational expenses. As a result, while initial adoption depends on considerable financial solutions to lower capital cost, economic viability was seen in the long term. Additionally, it's crucial that the PUVMP's actions and programs are executed in the proper order. Even before mandating the creation and submission of the LPTRP, route reduction, and investments in new fleets, regulatory reform is necessary. Had they been given more time to plan and adapt for modernization, this would have allowed for improved appreciation and acceptance by stakeholders (Congressional Policy and Budget Research Department, 2020). According to research by Angeles and Frisnedi (2020), the E-Jeepney doesn't require any further marketing to commuters. Therefore, a uniform policy and set of guidelines are needed for both commuters and aspiring E-Jeepney drivers. The Jeepney Drivers are likewise confused about the loan process. Additionally unknown at the time of this investigation are the upkeep and repairs. The LGUs' and the Jeepney drivers' communication on the franchise is still unclear. Uncertainty persists regarding the electric vehicle's source. It is currently unknown how well the auto mechanic will be able to maintain and repair an E-Jeep. Additionally, there was no information regarding the location or method of charging for E-Jeepney drivers. It seems that there is still uncertainty on how the Department of Transportation would implement the PUV Modernization. Filipino identity is thought to include the Jeepney's unique design. Where it seems that the lawmakers

don't care about keeping our past alive.

B. Sustainability of Public Transportation Modernization

In the aspect of public transportation, the basis of sustainability is divided into three facets: social, economic, and environmental. The social dimension tackles programs and infrastructure offered to minorities, the economic dimension for earning a profit, and the environmental dimension for overseeing the prosperity of the environment (Kuhlman & Farrington, 2010). The United Nations (UN) has established guidelines for sustainable transportation namely, accessibility, price, pollution, safety, equality, and longer commute times in cities (Karjalainen & Juhola, 2019). Accordingly, it is logical to assess the sustainability of any transportation-related program the government implements. The beneficiaries—commuters, jeepney drivers, and jeepney operators—of the Public Utility Vehicle Modernization Program (PUVMP) have the right to question its feasibility and efficacy since they are the front liner to the program's aftereffects.

Primarily, it is important to identify the reason why the government took the initiative to reform the glorious legacy of traditional jeepneys. Jeepneys are the most qualified vehicle for modernization; it is considered incompetent and a hindrance to the rapid development of the Philippines (Andalecio et al., 2020). The Land Transportation Franchising and Regulatory Board (LTFRB) views traditional jeepneys as posing safety risks and causing environmental harm (Kusuma, 2023). Its outdated structure endangers citizens in their day-to-day commuting activities, adversely affects the environment, and increases congestion in already-bustling roads. Given that the majority of jeepneys are Japanese-made and used but restored older models, they are well known for their infamous smoke-belching diesel engines. It thus resulted in substantial carbon dioxide (CO2) emissions (Cerio, 2017). Additionally, because of the duration and cost it might consume to decarbonize maritime, rail, and air shipments, the electrification of passenger cars and Public Utility Vehicles (PUVs) indicates great potential for sustainability (Agaton, et al., 2019). On the other hand, Gumasing ,et al. (2021) expressed that commuters often endure excessive noise from the surroundings, exposure to pollutants resulting in dirt accumulation, and risks stemming from the operation of older, unsafe jeepney units. Furthermore, in a survey conducted in 2013, jeepney passengers deemed jeepneys as loud, unclean, and hazardous (Okomura, et al. as cited by Mateo- Babiano, et al., 2020). As a result, some commuters are changing their preferences, particularly in light of the entry of new utility vehicles and alternative forms of transportation.

The Philippines is an archipelago abundant with natural resources—air included. Having access to clean and chemical-free air is vital to the overall health of a country. The Public Utility Vehicle Modernization Program (PUVMP) aims to replace the polluting diesel-powered jeepneys with electrically mechanized jeepneys or E-jeeps. In the study of Agaton et al. (2020), Electric Vehicles (EVs) have been proven as highly effective technology in fulfilling their purpose as a contributor to the energy transition towards a sustainable transport system in the following decades. It is expected to show promising results such as diminishing GHG emissions, elevating the quality of air, lessening the usage of fossil fuels, allowing the conversion of renewable energy, and overall establishing a sustainable mode of transportation. In addition, Electric Vehicles (EVs) are expected to decrease air pollution, reduce dependence on oil, and empower the execution of the Zero-Emission Transport Sector (Guno, et al., 2021).

As stated by Garcia, et al. (2022), the PUVMP comprises ten (10) components namely, regulatory reform, local transport planning, route rationalization, fleet modernization, service contracting, financing, vehicle useful life, pilot implementation, stakeholder support, and communication. These components, as explained by Tacderas, et al. (2021), were set to convert the public transport fleet to a cleaner and less emitting design, while assembling and uniting operators for and in routes. These factors are evidence that the jeepney modernization program is a program meant to safeguard the environment in the long run.

Meanwhile, in the socio-economic aspect, the Public Utility Vehicle Modernization Program (PUVMP) initially garnered criticism from its recipients. Comparing the traditional jeepney's physical composition to the modernized jeepney alone prompts financial stress for jeepney drivers and owners. Mendoza (2021) explains that it would take a huge amount of budget to revamp the conventional jeepneys. A sum of Php 11.68 billion is needed to displace 73,000 traditional jeepneys in Metro Manila, while Php 540 to 750 billion is required to take the place of the 300,000 traditional jeepneys nationwide. Furthermore, it would take 70 years to replace the diesel-powered jeepneys in the former and 270 years for the latter. On the other hand, findings in the study of Pontawe and Napalang (2018) suggest that the rate of expenses for modernized PUJs varies. The maintenance expenses are less than the expected amount since the modernized vehicles require minimal maintenance. The operational costs, however, were higher because of additional resources such as the inflation of fuel prices and added manpower and facilities. These brought higher income opportunities for the working cluster. Furthermore, results from the interview with Public Utility Jeepney (PUJ) drivers in Laurel, Batangas discuss that despite the awareness of the aforementioned, they have exhibited disagreement with the program due to financial reasons and believing that it is more cost-effective to repair and maintain the traditional jeepney rather than transforming it into a whole new vehicle (Cantero, 2019).

Despite these negative reviews, the Public Utility Vehicle Modernization Program (PUVMP) ensures positive effects, specifically on the employment sector. Malasique, et. al (2022) claims that by simply relocating our funds to reforming public transit instead of the usual repair and maintenance of roads and highways, an additional 20% of jobs can be produced. This was supported by Mobility Lab (2015) stating that situating public transit jobs in areas with heightened unemployment rates produces 2.5 times the value of work opportunities. Indeed, it was discussed earlier that additional manpower and facilities were required to operate modernized jeepneys. Therefore, the establishment of a sustainable transport system united

engineers, researchers, marketing specialists, urban designers, customer service managers, and social workers to generate progressive solutions to public transportation and aid in creating universal tactics for global issues relevant to urbanization (Zavyalova et al., 2016). The modernization of the traditional jeepney also opens the possibility of remodeling its historical and popular physique. Although this may send an impression to Filipinos that our culture is gradually being forgotten, several studies have claimed that comfortability and safety in riding a jeepney should be prioritized. Frisnedi and Angeles (2021) present that the interior and exterior structure of the modernized jeepney's cabin including its height, length, and width may deliver comfort to the commuters. Poorly constructed jeepney cabins or those lacking proper ergonomic application can also lead to discomfort and risk of injury (Gumasing et al., 2020). Moreover, results from the study of İmre and Çelebi (2017) measuring the level of comfort of commuters in public transport show that commuters may prefer private vehicles over public vehicles in times when their level of discomfort is higher than their acceptable threshold. In relevance to that, convenience, cultural and psychological values, status symbols, and smooth driving were considered contributing factors to the level of comfortability of commuters towards private vehicles. In another study conducted by Villegas et al. (2021), the "safety criterion" E-jeepneys were granted the highest satisfaction rating by the respondents. These data only conclude that the modernized jeepneys should not only be beneficial to the environment and economy but also to the overall well-being of commuters.

C. Challenges and Opportunities of Public Transportation Modernization Program

The destabilizing processes in the PUVMP case primarily affect a few transport companies lacking the resources to modernize their fleet. Sunio et al. (2019) state that "transport groups represent the most active resistance to the jeepney modernization program." Several transportation organizations created the "No to Jeepney Phaseout" Coalition. The PUVMP is all about replacing outdated jeepneys, which will mean thousands of jobs nationwide for jeepney operators and drivers. Since they cannot afford an updated vehicle, the majority of jeepney owners and drivers argue that a modernization program is unnecessary. The middle-class and working-class commuters are the only ones with opinions about the proposed minimum fare and financial structure. Because the jeepney was the nation's least expensive mode of transportation, all commuters selected it. A modernized jeepney was also expected to cost between 1.2 and 1.3 million pesos. As a result, the corporation claimed that funds from the government were utilized to finance the modernization project (Mendoza, 2021). The stakeholders believe that the transportation system will benefit from better jeepney features. The business further asserted that the revised model was more environmentally friendly due to the government's need for euro-4 engines, which reduced pollution in Metro Manila (Andalencio et al., 2020).

In the Philippines right now, jeepneys are still the most effective way to deal with the modernization and growth of the transportation sector. Most Asian and European nations have well-organized transportation systems with features like cashless payments, punctual bus timetables, constrained commuter capacity, and many others that make their nations leaders in the world when it comes to cutting-edge transportation systems. According to studies, jeepneys are unprepared for the country's rapid development. Timely issues that typically demand the government's attention include the lack of a maintenance system, assuring the safety of commuters, including jeepney operators and drivers, its detrimental impacts on the environment, and the incorrect system of loading and unloading people. The government made the decision to adopt the Jeepney Modernization, which gradually replaced the outdated ordinary jeepneys with more modern vehicles (Andalecio et al. 2020).

On the other hand, Gatmaytan, et al. (2020) claimed that only middle- class and working-class commuters could afford the suggested minimum fee from a financial standpoint. Since jeepneys were the least expensive form of transportation in the nation, all commuters chose this mode of transportation. A modernized jeepney was also expected to cost between 1.2 million and 1.3 million pesos. Therefore, the manufacturer claimed that government funding for a modernization program had been supplied. According to the stakeholders, the transportation system would benefit from improved jeepney features. The manufacturer added that upgraded units were better for the environment because Manila's pollution was decreased by the government's requirement for euro-4 engines. Stakeholders were also concerned about the program's impact on unemployment. Independent jeepney drivers or operators who continued to operate. The biggest obstacle to their full support for the idea was the removal of the jeepney's cultural heritage after modernization. If there was no discipline, the modernization of the jeepney was not beneficial for the nation, according to the drivers. The renovation of jeepneys was seen by the commuters as a positive step but hard for globalization.

The cost of updating the jeepneys, which have long been considered an ineffective mode of public transportation because they use decades-old, inefficient, and environmentally harmful diesel engines, has been the most divisive topic in the nation. The government's effort to modernize PUVs was revived, according to Transportation Secretary Jaime Bautista's announcement in October of last year. However, the issue is that the cost of a replacement unit has doubled to P2.4 million, which has been the cause of the program's ongoing criticism. Despite having low daily incomes as a result of the pandemic, Ricardo Rebao, head of the Federation of Jeepney Operators and Drivers Association of the Philippines (FEJODAP), noted that operators had to pay a monthly amortization of P475,000 to run 15 new jeepneys (Cadiz, 2022).

The Political, Economic, Social, Technical, Legal, and Environmental (PESTLE) made an analysis to examine how various factors, as seen from the perspectives of various transport stakeholders, influence the adoption of EVs in the public transportation system using the Philippines as a case study. According to survey findings, the primary obstacles to the adoption of electric public transportation are economic and

technological. This includes high up-front and ongoing costs, a lack of infrastructure for charging, problems with driving range and use in various terrains, and the accessibility of EV components and maintenance facilities. On the other side, the key enabler is the sizable public support, backed up by policy and legal forces, for the upgrading of the public transportation system through the use of EVs. The government should invest in sustainable energy sources, build more public infrastructure, diversify the transportation industry, fund the development of locally made EVs, and launch a significant information campaign to inform the public of its benefits in order to create a zero-emission public transportation system, according to this study (Guno et al. 2021).

Another barrier to look at is there might not be enough jeepneys to transport thousands of commuters each day if the old jeepneys are entirely phased off of our highways. This is due to the possibility that many jeepney operators and drivers may consider closing their doors and looking for alternative sources of income. In turn, this might lead to more traffic congestion, which would only make daily commuting issues for the riding public worse. Given the varying population sizes and income levels of each province, municipality, and city, the government cannot undertake the jeepney modernization program as a one- size-fits-all solution throughout the nation. It has to continue choosing which cities and towns to go first, based on the profitability of the routes there and the number of jeepney drivers who can form cooperatives. The LTFRB's move to delay the program is understandable given the plight of many jeepney drivers, but it cannot delay the program for too long because of the country's pressing need to keep public transportation efficient and also protect the environment (Philippine Daily Inquirer 2023).

D. Public Transportation Policy Implementation: The Philippine Context

Creating sustainable public transportation networks that offer mobility, accessibility, and customer service on par with private vehicles is one of the real- world solutions to transportation issues. Enhancing service quality, alleviating pollution, limiting state subsidies for urban transportation, increasing the effectiveness of transportation networks and land use, enhancing the mobility of people with disabilities, and preventing conflicts of interest among public transportation stakeholders are all goals of sustainable transportation systems. (Spirin, Zavyalov & Zavyalova, 2016). All urban people must have access to mobility in a safe, environmentally friendly mode of transportation as part of a sustainable transportation system. Addressing the diverse and often conflicting needs of individuals from different socioeconomic backgrounds poses a significant challenge in policymaking and social interventions" (Roy, 2020)

The regional patterns of development, economic viability, environmental consequences, and socially acceptable quality of life are all significantly influenced by the transportation system. It is not unexpected that government organizations continue to devote a sizable portion of their budgets to planning and creating more effective transportation systems (Murray et al., 1998). As the prime mode of transportation used by Filipino commuters to travel to their destinations, the jeepney is one of the most well-liked forms of public transit in the Philippines. However, the government decided to implement a modernization program in which outdated regular jeepneys would gradually be phased out and replaced with modernized jeepneys due to problems like a lack of maintenance systems, ensuring the safety of commuters and drivers, harming the environment, and improper commuter loading and unloading (Andalencio et al., 2020).

As listed by Mariano (2017), the Public Utility Vehicle Modernization (PUVM) Program in the Philippines will incorporate changes to the nation's public road transport system by introducing safer and more environmentally-friendly vehicles, stricter regulations, and consolidation of the business. The purpose of the program is to increase the quality of life of the citizens living in metropolitan areas, by reducing financial losses arising from productivity which is lost due to travel, reduce medical costs and preventable fatalities, reduce GHG emissions, and improving the financial standing of the operators and the industry by raising quality service standards.

The PUVMP intends to deploy in this period around 200,000 e-jeepneys and about 100,000 e-trikes each year. Currently, the cost of e-trikes ranges from USD 3,500 to USD 9,500, and e-jeepneys, which are more expensive than their competitors, are from USD 25,000 to USD 30,800. The government provides "5- 6-7-8" financial incentives, which include a 5% subsidy for each unit of the vehicle, a 6% interest rate for a purchase loan payable in 7 years, and a maximum of PHP 80,000 (USD 1500) in equity subsidies, to support operators and owners adopting the PUVMP (Agaton, Collera, & Guno, 2020).

The jeepney has to be updated for the sake of our commuters. Since 1992, there have been initiatives to do this. Examples include the order given by President Fidel V. Ramos to DOT Secretary Jesus Garcia Jr. to "...initiate moves that will lead to the eventual phase-out of jeepneys and the "PUV Rationalization Program" introduced by the Aquino government in 2015. The "PUV Modernization Program" (PUVMP) of the Duterte government is a component of the long-standing initiative to update the Jeepney.

Nevertheless, the modernization of the jeepney is also a never-ending source of contention between policymakers and jeepney drivers. The entire attempt to modernize the jeepney comes to a grinding halt if the scales are tipped in one direction. If the scales were tipped the other way, nearly 200,000 jeepney drivers and operators would lose their only means of support (Just and Humane Public Utility Vehicles Modernization Act, 2019).

E. Synthesis

Traditional Jeepneys in the Philippines were considered unsustainable due to their adverse effects on the socio-economic and environmental aspects. Its high carbon emission pollutes the air and increases traffic congestion on major roads and highways, which hinders the country's development. The government decided to modernize the public transportation system in the country to lessen the negative impact on the

environment, lessen traffic congestion, and ensure the safety of commuters and drivers. However, the implementation of the Public Utility Vehicle Modernization Program (PUVMP) faces challenges due to socio-economic aspects; some Jeepney drivers and operators criticize it because of the modern jeepney's expensive cost and that the majority of the jeepney drivers and operators will lose their jobs and livelihood, hence affecting their family. Despite these negative reviews, the implementation of PUVMP poses positive effects, especially in the employment sector. It intends to increase the quality of life in metropolitan areas, decrease financial losses resulting from missed productivity due to travel, reduce medical expenses and preventable fatalities, lessen greenhouse gas (GHG) emissions, and enhance the operators' and industry's financial standing by raising service quality standards.

3. Methodology

A. Methods of Data Gathering and Analysis

The research aimed to assess the policy implications of incorporating E- jeepneys in the Public Transport System in the City of Valenzuela, Philippines. The Valenzuela City may not have tall buildings, and skyscrapers, hence, it does not look like a rich city. However, the city has a lot of factories from food to plastic industries, and the private and public infrastructures everywhere, therefore it is considered as a highly-urbanized city. The city is one of the first LGUs to adapt the PUVMP since they launched the COMET 3 (E-Jeepney), which is the country's first all-electric public transport fleet in November 15, 2018, and also the other E-Jeepneys operating in the JEEP Bus route.

Since Valenzuela City is one of the first cities to adopt the modernization program, their experience in the PUVMP implementation is significant to attain the data and information that the researchers needed. To properly assess the policy implications of incorporating E-Jeepneys in the public transport system in the community, a Mixed-Method Approach, combining quantitative and qualitative data collection techniques, was utilized in the study. Researchers analyzed both numerical and non-numerical data by combining these methodologies. Sustainable development is a multifaceted concept that encompasses three main dimensions: economic, social, and environmental. Each of these dimensions is interconnected and interdependent, and all are essential for achieving sustainable development. Particularly in various disciplines including education, health sciences, psychology, and sociology (Parikh et al, 2015). Mixed methods research, a third methodological paradigm, has emerged alongside qualitative and quantitative research as a prominent approach for investigating complex social phenomena" (Bryman, 2018). Mixed methods research (MMR) provides a comprehensive and holistic understanding of research questions by combining quantitative and qualitative data collection and analysis techniques. This approach allows researchers to explore the complexities of human behavior and social phenomena in a more nuanced and comprehensive manner than either method alone could achieve" (Creswell & Plano Clark, 2018). Triangulating one set of results with another can improve understanding and increase the reliability of inferences (Azorin-Molina, 2016).

The Research Design Matrix outlines the study's objectives, the potential data sources contributing to these objectives, the tools for collecting these data, and the analytical methods enabling researchers to assess and comprehend the data's significance within the study.

B. The Case Study Site

Valenzuela City, being a province of the Philippines, provides an intriguing site for exploring the policy implications of E-Jeepney integration into public transport systems. The city, sitting within the Metro Manila Area, is famous for its dynamic urban environment as well as transport initiatives that take into account sustainability. Exploring the possible consequences of E-Jeepneys necessitated the analyzing of the socio-demographic features of the Valenzuela City.

In Valenzuela City, there is a diverse variety of people from varying socio- economic status, mix of different age groups. The city has both middle-class and low-income residents, thus

Table 1
Research design matrix

Objective	Data Sources	Tools	Analytical Tool
To determine the program implementation at the local level.	LGU (Mayor's office; Bureaus; Agencies)	Semi-Structured Interview Question	Narrative Analysis
	Government Data/ Documents/ Records (Local Resolutions and Ordinances, DOH, DOF, DTI, DBM, NEDA)	Data/Document Review	Data/Document Analysis or Textual Analysis
	Secondary Data (Existing Literature, Studies)	Literature review	Document Analysis/ Textual Analysis
To identify the problems and challenges in the implementation of the program	LGU (Mayor's office; Bureaus; Agencies)	Semi-Structured Interview	Narrative Analysis
	Government Data/ Documents/ Records (Sangguniang Panlungsod)	Data/Documents Review	Document Analysis
	Secondary Data (Existing Literature, Studies)	Literature Review	Document Analysis
To collect public views and experiences regarding the implementation of the program	Respondents A and Respondents B	Survey Questionnaire (open--ended)	Descriptive Analysis
To develop recommendations for program enhancement	LGU (Sangguniang Panlungsod)	Semi-Structured Interview Question	Narrative Analysis
	Experts/Consultants	Data/Documents Review	Content Analysis
	Secondary Data (Existing Research/Literature)	Literature Review	Document Analysis

showing a wide range of occupations and economic activities. Valenzuela City has a combination of commercial, industrial, and residential zones supporting a sizable number of workers employed in sectors such as manufacturing, trade, and services. On the other side of the coin, it is educational institutions such as universities and colleges, and that the youth from all over the country are mobilized constituents of this big number of learners. The diverse economic activities and demographic factors support the pertinence of studying the policy implications of E-Jeepneys in terms of being the alternative means of transportation for commuters in Valenzuela City.

In addition, Valenzuela City is characterized by a high population density hence efficient and eco-friendly mobility system must be provided. E-Jeepneys integration complements the city behind environmental degradation concerns and CO2 footprints reduction. With the urban challenges of the city such as traffic congestion and air pollution, the application of electric vehicles which include E- Jeepneys will result into an improvement of the public transportation and be a contribution to a more sustainable future.

Fig. 2. National capital region and Valenzuela city map
Source: https://pngtree.com/free-png-vectors/philippine-map
Source: valenzuela.gov.ph

1) Profile of the Respondents

This study is conducted with the responses of commuters and jeepney drivers within Valenzuela City. Precisely, a sample of 30 respondents was selected from each population group to participate in the study. The choice of this sample size can thus be explained by different reasons. Firstly, "Rule of Thumb", an estimate adopted almost universally for sample size calculations. The general recommendation for most studies is an N of 30 as an indicator. With regard to the limited population data and the need for manageable research, 30 per group (Commuters and E-jeepney Drivers) was considered appropriate. This guarantees that the sample reflects the general sentiment of each group thus making it easy to make generalizations about them. The combination of commuters and E-jeepney drivers' samples yielded a total sample size of 60, which is sufficient to bring robust and insightful data for this study. The Rule of Thumb provides a working solution, but there are other variables which should be taken into account, those being population variability, desired confidence level (95%), and the acceptable margin of error (5%). For this population the relatively homogeneous sample and the acceptable margin of error give reason for the sample size selection. A systematic approach was applied wherein every printed survey given to respondents had corresponding reference numbers used for subsequent categories by the researchers. The surveys were conducted by face- to-face interviews which ensured that the respondents were adequately guided as they completed the questionnaires.

Table 2 presents the socio-demographic information pertaining to each category of respondents. Additionally, it includes the reference numbers assigned to each questionnaire and the corresponding survey dates.

In the conducted survey, typical personal details often collected by researchers—such as age, gender, educational background, and civil status— were not gathered from participants. The sole critical criteria were residency in Valenzuela City (for commuters and drivers) and direct involvement in driving or operating E-jeepneys (for drivers). This approach in the survey questionnaire was also recommended by the statistician.

Table 3 outlines the important factors for choosing participants during data collection.

2) Profile of the Key Informants

In this study, the researchers conducted semi-structured interviews to a respective key informant such as the city's local leader. The interview proposal was personally presented in the key resource's office and was subjected for a face-to-face or virtual interview.

Table 2
Surveys: Socio demographic profiles of the respondents

Residence	Respondents	Target Participants	Reference Numbers	Date Surveyed
Valenzuela	Drivers	30	1001-1030	October 11-12, 2023
	Commuters	30	2001-2030	October 10, 2023

Table 3
Criteria for identifying target participants for extracting policy implications associated with the integration of e-jeepneys into the public transport systems in Valenzuela city

Criteria	Remarks
Location (Drivers and Commuters)	Consider focusing on respondents from Valenzuela City, Philippines, as it is the specific context of the study. This will allow the researchers to gather insights directly related to policy implications within the particular area.
Expertise and Knowledge about Driving or Operating E- jeepneys (Drivers)	Considering experienced E-jeepney operators as respondents ensures a practical understanding of vehicle operations, promoting safety, efficiency, and informed insights for the improvement of E-jeepney services.
Experience in Accessing E- jeepneys (Commuters)	Considering individuals with experience riding E-jeepneys is important because they bring firsthand knowledge of the passenger experience, allowing for better understanding and improvement of service quality, comfort, and efficiency for users.
Availability and Accessibility	Consider the practicality of accessing and engaging with potential respondents. Ensure that they are accessible for data collection, such as through interviews, surveys, or focus groups.

Table 4
Interviews: Backgrounds of key informant

Key Informants	Place	Position	Functions	Years in the Position	Education	Date Interviewed
Local Leader/Policy Implementer	Sangguniang Panlungsod of Valenzuela	City Councilor	Vice Chairman, Valenzuela Transportation Franchising and Regulatory Board Chairman, Committee on Public Utilities and Facilities	4 years	Bachelor of Laws, San Sebastian College Recoletos Manila AB Political Science, San Beda University	November 29, 2023

a. Local Leader

The City Government of Valenzuela oversees the administration of local policies and services aimed at enhancing the community's livelihood, safety, health, and overall well-being. Additionally, it adheres to mandates stipulated by the National Government. Under its umbrella, the Sangguniang Panlungsod of Valenzuela acts as a legislative body responsible for enacting ordinances, ratifying resolutions, and allocating budgetary funds for the city's prosperity. City Councilor Ricardo Ricarr C. Enriquez, Vice Chairman of Valenzuela Transportation Franchising and Regulatory Board, and Chairman of the Committee on Public Utilities and Facilities, is actively involved in extracting data for this study. His participation serves as a solid basis for understanding the city's experiences and viewpoints in implementing the Public Utility Vehicle Modernization Program (PUVMP).

C. Data Collection

Researchers employed a wide range of tools and resources, such as interviews, document and data reviews and literature reviews, to collect substantial data for the study. This approach was taken to achieve a deep understanding of the investigated problem.

Said data was carefully examined, understood, and presented to come up with a conclusion if the e-jeepney will continue to be a feasible alternative for public transportation in Valenzuela City. The researcher had a better understanding of the viewpoints and experiences of people at stake, including jeepney drivers, operators, and commuters, through conducting interviews and survey questionnaires.

Open-ended questions were specifically used in survey questionnaires to gauge respondents' sentiments. Additionally, the researcher had compiled current, applicable research on the chosen issue through a review of the literature and a review of the data and documents to produce a cogent summary of the body of knowledge.

1) Research Design Flow Chart

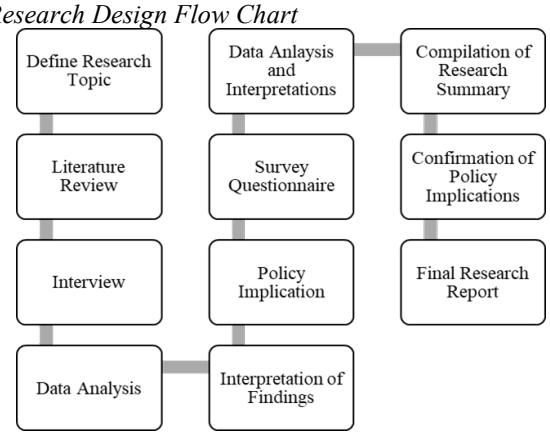

Fig. 3. Research design flowchart

The data gathering process in the study was described in the research design flowchart. It began with interviews conducted with the LGU, focusing on the city of Valenzuela, to initiate the extraction of policy implications. Once the information has been gathered, it will be evaluated for policy implications followed by utilization of open-ended survey questions for respondent A (commuter) and respondent B (jeepney drivers). Finally, secondary data sources, comprising government statistics, resolutions, and ordinances, were used to showcase and confirm the graded policy implications.

2) Survey Questionnaire

The researchers utilized a survey to achieve a holistic view of the policy implications linked with the implementation of e-jeepneys into the public transportation systems in Valenzuela City. The questionnaire was made up of two parts with the purpose of getting mixed information such as numerical and categorical. Unstructured interrogatories were employed, letting subjects elaborate their answers without being confined by the given list of alternatives. The approach gave the participants latitude to present their utterances and experiences in a more elaborate way allowing the researcher to follow up on some leads that would not have been possible on a close -ended questionnaire.

Open-ended questions are the ones that allows the respondents give narrations of their views and ideas on the use of e-jeepneys hence giving a deeper and wider analysis. Contrary to closed questioning, the freedom afforded to participants enables them to express their views and experiences thereby providing greater insight into the public opinion. Although open-ended questions present difficulties for data analysis which results from their qualitative responses, they still give a more exploratory and nuanced perspective.

As for data collection, the researchers combined consumer interviews with selected jeepney drivers and a group of commuters who were chosen from wide sampling to arrive at a representative picture of diverse opinions and experiences with the city's transport system. The open-ended questions provided a full exploration of the policy implications gaining a more nuanced and context rich perception of the matter. The answers gained through the unstructured questionnaire brought value to the evaluation of the feasibility of the policy, creating a more complete and qualitative picture of the possible ramifications of introducing e-jeepneys into the public transport system.

3) Interview

Initially, due to the limited time of the Key Informants, the researchers colored the interviews in the offices of the respondents. All key informants-NCR, Regional and the City Councilor of Valenzuela- which were involved preferred a virtual type of interview, soft copies of the questioners was sent to them. The researcher pursued these individuals' views and

experiences to gather rich and extensive responses regarding the use of e-jeepneys. The data derived from these interviews' implications regarding the e-jeepneys in Valenzuela City. Interviews typically encouraged adaptability. The questions were formulated in a definite order allowing comparing the answers given by the respondents. Opinions and experiences of respondents were the main sources of differentiating strength, weakness and improvement areas. Their advice was thus like a basis in formulating policies, implementing improvement programs and decision making

a. Expert

The interviews were one of the dominating tools of public transport research through which the researchers could achieve in depth information from the experts in the area. There were enough experts in the public transport management that were knowledgeable and have experience in improving the public transport services for the citizens. One of the main purposes of conducting this in-depth interview is to get their perception from their experiences and viewpoint about the improvement of the public transportation system in the country. For the researchers to obtain a primary source of information on the difficulties faced by the public transit professionals including the programs or actions they used, interviews were conducted.

b. Policy Maker

The researchers had to learn about the sustainability of the PUVMP Implementation, thus they needed to conduct an interview with a government official at the local level. The inputs and findings the researchers got from the city councilor are crucial to the study, as they are offering a very wide view on the policies and practices that are virtually used to control the performance of the PUVMP. Similarly, policy-level authorities could give an overview of the consideration process and the variables considered when allocating fund to the PUVMP. The analysis of the gaps and challenges in public transportation was made convenient with the knowledge of these facts. Collaboration opportunities of and challenges for governments and community-based organizations in the PUVMP implementation may also be facilitated by interviewing policymakers in local government. The partnership could have made the PUVMP implementation more effective and efficient

4) Data/Document Review

The researchers, through a data/document review, ensured that their analysis was comprehensive and obtained pertinent information for this study. The method is centered around government data, records, as well as documents bounded to LGU or City Councilor's Office, which utilizes content analysis and examination of existing documents that are related to the research matter. The analysis of documents was also completed to s secondary data, previous research, and studies. The data/document evaluation procedure was initiated by the researchers who appraised the available documents related to the investigation. It was paramount to trace the key sources for this evaluation, which include, among others, Government documents, local ordinances and resolution, policy documents, and others. The data from selected respondents, Respondents A (Commuters) and Respondent B (Drivers/Operators), were obtained using descriptive and narrative analysis. The researchers acted to acquire these materials once the relevant documents had been identified during their review process. This entails asking for permission either from the appropriate authorities or organizations, seeking consent, or following any procedures demanded for document collection.

5) Literature Review

This study conducted a literature analysis to investigate the available information regarding the efficacy and potential sustainability of e-jeepneys when deployed in Valenzuela City. This investigation was based on secondary data sources, such as published works and studies, providing a broader perspective and aiding in the interpretation of the primary data. The researchers aimed to gain crucial insights into the approach adopted by the LGU in administering the program by examining secondary data sources. Reviewing previous literature and studies would result in a better understanding of the diligence and assistance provided by the local government in carrying out this project. Additionally, it would clarify the substantial effects of the implementation in Valenzuela City. By reviewing pertinent literature and studies, the researchers aimed to assess the advancements made in maintaining this project and to pinpoint the issues and difficulties encountered throughout program implementation. Utilizing secondary data sources was deemed essential to contextualize the main data collected and gain a thorough grasp of the problems being studied. Combining data from previous publications and experiments enabled the researchers to learn more about the difficulties, achievements, and prospective areas for development.

D. Data Analysis

The research was characterized by a fusion of qualitative and quantitative methods to attain an extensive understanding regarding the Public Utility Vehicle Modernization Program (PUVMP) and its implementation in Valenzuela City. Data analysis was utilized to interpret the data gathered from the respective respondents, shedding light on the effectiveness of the program at the local level.

In this study, semi-structured interviews and survey questionnaires were used as data-gathering methods. Subsequently, textual analysis was employed to review related literature and documents that shared relevance to the problems and challenges produced by the program's implementation. Descriptive analysis was used to interpret the responses of the respondents about their accounts in accordance with the modernization program. After gathering the necessary data, the researchers proceeded to formulate conclusions and recommendations necessary for the study.

1) Content Analysis

The process of content analysis allowed the researchers to scrutinize the responses provided by the respondents during the interviews. Through this, the study was able to exhibit a broader view of the implementation of the Public Utility Vehicle Modernization Program (PUVMP) at the local level, identify the problems and challenges encountered by the City Government of Valenzuela in the implementation of the program**,** and develop recommendations for enhancing the

program. A content analysis of the interview responses also allowed the researchers to gain an accurate and first-hand account of the respondents' experiences with the program's implementation.

2) Descriptive Analysis

A descriptive analysis was done as an attempt to understand the views and experiences of the public on the implementation of the Public Utility Vehicle Modernization Program (PUVMP). The study population is organized into two categories, the commuters, and the drivers or operators, whom were both interviewed through an open-ended survey. Once the researchers had obtained the necessary data, they then acquired first-hand accounts and feedback from the program's beneficiaries.

3) Textual Analysis

Similar to content analysis, employing a textual analysis on the government data, records, or documents and existing literature or studies allowed the researchers to gain an array of pre-existing proven and tested conclusions and recommendations regarding the Public Utility Vehicle Modernization Program (PUVMP). Researchers observed a thorough analysis of the literature and produced valuable results and observations.

4) Quantitative Analysis

In this study, the statistician did not employ a quantitative approach. The determination of the mean and frequency of the data was deemed the only valid method, as the paper did not aim to identify relationships or differences between variables. The mean represents the sum of values within a sample divided by the sample size and is, in other terms, known as the average (Hurley & Tenny, 2023). Meanwhile, frequency indicates how often a value occurs in a dataset (Government of Canada, Statistics Canada, 2021). Both the mean and frequency were utilized in assessing the extent to which respondents agreed or disagreed with various aspects of the Public Utility Vehicle Modernization Program in Valenzuela City.

E. Framework of Analysis

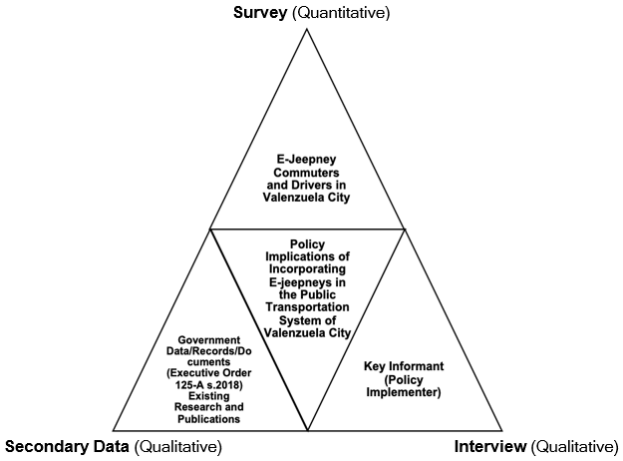

Fig. 4. Research methodology

This study gathered data from conducting surveys, interviews, and reviewing secondary data. The knowledge about the implementation of e- jeepney began with semi-structured interviews with the Vice Chairman of Land Transportation and Franchising Regulatory Board (LTFRB) of Valenzuela City. The researchers utilized information from the relevant government data about the modernization program, specifically for Public Utility Vehicle (PUV) published on multiple platforms for soft copies of data documents and printed data documents as tangible sources. This relevant information will serve as a secondary data source. Through open-ended questionnaires data will be gathered from commuters and drivers to weigh their opinions, suggestions and recommendation to the Public Utility Vehicle Modernization Program (PUVMP) implementation.

F. Statement of Ethical Considerations

Ethical concerns were taken into account when performing this research to ensure that the rights and welfare of all participants were protected. The research was authorized by the academic institution's research review board, and all subjects provided informed permission before taking part in the study. Any personal information gathered throughout the study will be kept strictly secret and used exclusively for the purposes of this research. The collected data will be processed and provided in a way that does not expose the names of the participants. Furthermore, the research will follow all applicable ethical principles and standards,including those pertaining to data protection, informed permission, and participant fairness.

4. Presentation, Analysis, and Interpretation of Data

Section 4 comprises the data acquired from the respondents. It also exhibits and discusses the results of the statistical analysis which are organized and categorized in tables.

A. Implementation of the Public Transportation Modernization System

Councilor Ricarr Enriquez, having recognized the Land Transportation Franchising and Regulatory Board's (LTFRB) national authority over public utility vehicles (PUVs), has emerged as a crucial figure in Valenzuela City's ongoing PUV modernization program. While Valenzuela City has consistently complied with national mandates, Enriquez has proactively addressed potential challenges arising from the program, particularly the financial burdens it may impose on operators and drivers. His leadership in securing financial assistance for traditional jeepney owners through Ordinance No. 819 stands as a testament to his commitment to bridging the gap between national policies and local needs. This initiative, designed to help drivers meet program standards and qualify for loans, embodies Enriquez's dedication to ensuring a smooth transition for Valenzuela's PUV sector. Furthermore, his advocacy for symposiums and seminars underscores his belief in the importance of preparedness through education. By balancing national regulations with local concerns and actively supporting the city's PUV stakeholders during this transformative period, Councilor Enriquez has cemented his position as a key player in Valenzuela's transportation landscape.

B. Problems and Challenges Identified by the Local Government in regard to the Implementation of the Program

The Councilor of Valenzuela City, the Chairman of the Committee on Public Utilities as well as Vice Chairman of the Valenzuela Transportation Franchising and Regulatory Board draws a picture of Valenzuela's E-jeepney program. The councilor accredits its potential for environmental sustainability but warns of financial barriers and social disruption it could result to. The high cost of modernization coupled with that threaten both drivers and operators financially may result to the measure of increasing the fares. The councilor similarly raises issues on livelihood losses faced by those who cannot afford to upgrade, drawing attention to program impacts on the social fabric of the jeepney industry.

1) Financial Burden and Fare Increase

The high price of buying and retrofitting jeepneys makes it challenging for the operators and drivers. This may be the source of the fare increases whether the parties are directly involved or indirectly. More so, it may also disproportionately impact passengers especially the low-income earners almost making the program less accessible and losing the public's support (Guno et. al, 2021).

2) Livelihood Concern

The Public Utility Vehicle Modernization Program (PUVMP) in the Philippines, while aiming to improve public transportation, risks exacerbating existing social and economic inequalities. The high cost of modernizing vehicles and the need for new skill sets for drivers and mechanics could lead to job displacement for those with limited resources and training opportunities. This could disproportionately impact marginalized communities and individuals, potentially widening the gap between the rich and the poor. This raises social and economic concerns, potentially exacerbating existing inequalities.

C. Views and Experiences of the Residents of Valenzuela, Particularly the E-jeepney Drivers towards the Implementation of the Public Transportation Modernization System

The introduction of E-jeepneys in Valenzuela City has sparked considerable interest and debate. The Researchers, closely monitoring the program's impact, are excited to share their findings, highlighting both the positive advancements and persistent challenges that require attention. This study draws upon extensive data collected through surveys, interviews, and observations conducted with commuters, drivers, and stakeholders across the city.

Table 5 shows the views and experiences by the E-Jeepney *commuters* towards the implementation of the Public Utility Vehicle Modernization Program at Valenzuela City. Based on the result, the statement *"The modernization of jeepneys improves the overall experience of passengers.*" exhibits the *highest weighted mean of (3.17)* with a *verbal interpretation of (Agree)*. However, the statement "I am willing to pay a slightly higher fare for modern jeepney transportation" exhibits the *lowest weighted mean of (2.67)* with a *verbal interpretation (Agree)*. The *overall weighted mean for Table 6 is (3.76)* with a *verbal interpretation of (Strongly Agree).*

Table 6 shows the views and experiences by the E-Jeepney *drivers* towards the implementation of the Public Utility Vehicle Modernization Program at Valenzuela City. Based on the result, the statement "*The Jeepney Modernization Program will bring greater relief.*" exhibits the *highest weighted mean of (3.60)* with a *verbal interpretation of (Strongly Agree)*. However, the statement "*The transition to E-jeepney has resulted in an increase in my daily income*." exhibits the *lowest weighted mean of (2.57)* with a *verbal interpretation (Agree).* The *overall weighted mean for Table 7 is (3.12)* with a *verbal interpretation of (Agree)*.

1) Passenger Satisfaction and Willingness to Pay

The Researchers' data reveals a clear shift in passenger perception. The transition to E-jeepneys has demonstrably

Table 5
Views and experiences of the e-jeepney commuters towards implementation of the public utility vehicle modernization program at valenzuela city

Indicators	Mean	Verbal Interpretation
The modernization of jeepneys improves the overall experience of passengers.	3.17	Sumasang-ayon (Agree)
I am willing to pay a slightly higher fare for modern jeepney transportation.	2.67	Sumasang-ayon (Agree)
I believe that the modernization of jeepneys is necessary to improve public transportation in my area.	2.90	Sumasang-ayon (Agree)
The current jeepney modernization program is more helpful for disabled and elderly passengers.	3.13	Sumasang-ayon (Agree)
I enjoy the level of accessibility and convenience that the program provides.	3.07	Sumasang-ayon (Agree)
Grand Total	**2.98**	**Sumasang-ayon (Agree)**

Note: Strongly Agree (4.00 – 3.26), Agree (3.25 – 2.51), Disagree (2.50 – 1.76), Strongly Disagree (1.75 – 1.00)

Table 6
Views and experiences of the e-jeepney drivers towards implementation of the public transportation modernization system at Valenzuela city

Indicators	Mean	Verbal Interpretation
Having e-jeepneys in public transportation improves my income as a driver.	3.40	Higit na Sumasang- ayon (Strongly Agree)
I believe that because of the jeepney modernization program the traffic has decreased.	2.73	Sumasang-ayon (Agree)
The transition to E-jeepney has resulted in an increase in my daily income.	2.57	Sumasang-ayon (Agree)
E-jeepneys are more comfortable and safe to ride compared to traditional passenger jeepneys.	3.43	Higit na Sumasang- ayon (Strongly Agree)
I agree to the additional fare in exchange for the service provided under the jeepney modernization program.	3.33	Higit na Sumasang- ayon (Strongly Agree)
Travel time is significantly shorter due to the current jeepney modernization program.	2.83	Sumasang-ayon (Agree)
The Jeepney Modernization Program will bring greater relief	3.60	Higit na Sumasang- ayon (Strongly Agree)
Grand Total	**3.12**	**Sumasang-ayon (Agree)**

Note: Strongly Agree (4.00 – 3.26), Agree (3.25 – 2.51), Disagree (2.50 – 1.76), Strongly Disagree (1.75 – 1.00)

improved the overall travel experience. Commuters report increased comfort due to air conditioning and spacious interiors (Regidor, 2016; ADB, 2017), enhanced convenience from designated boarding areas and predictable routes, and a greater sense of safety thanks to improved lighting, CCTV cameras, and stricter driver regulations. This positive perception translates into a willingness to pay slightly higher fares, reflecting the perceived value and improved quality of service offered by modern jeepneys.

2) Necessity and Belief in Modernization

There exists a strong consensus among Valenzuela residents regarding the necessity and benefits of jeepney modernization. The Researchers' findings align with existing studies, such as Cruz's (2016), which highlight the potential environmental benefits, including reduced air pollution, greenhouse gas emissions, and fuel consumption associated with E-jeepneys. Additionally, the program is seen as crucial for improving public transportation infrastructure, leading to a more efficient, reliable, and sustainable transportation system for the city (Land Transportation Office, 2017).

3) Accessibility and Positive Impact on Special Passengers

The Modernization program is evidently aiding accessibility of vulnerable populations. Jeepney with low floors equipped with ramps and wide doors eases boarding and travelling for passengers with disabilities and senior (ADB, 2017). This is consistent with the spirit of Researchers to have an inclusive program where the whole picture of the enlargement of the public infrastructure is considered.

4) Economic Benefits for Drivers and Traffic Reduction

E-jeepney drivers gain positively from the program. Higher fares, increased ridership, and lower operational costs (largely from fuel efficiency and less maintenance) (World Bank, 2017), are the determinants of better livelihoods for the drivers. Moreover, the studies by Asian Development Bank and the World Resources Institute show that jeepney modernization contributes greatly to traffic decongestion resulting to faster travel time and better transport system for the public (ADB, 2017; WRI, 2016).

5) Comfort, Safety, and Time Efficiency

With the transition to E-jeepneys comes the noticeable enhancement of the comfort and safety of the passengers (Regidor, 2016; Mayo et al., 2020). The inclusion of features such as air-conditioning, CCTV cameras, and better lighting are part of an unforgettable and trust-cultivated traveler experience. For the same reason, the researchers' data supports the shorter journeys that are reported as a result of the existence of specific routes and traffic flow improvement (ADB, 2017; WRI, 2016). It also in line with the program that is based on time efficiency in public transport.

6) Safety and Security of Passengers

Safety and security are the prime focus areas for the program. Passengers have embraced the introduction of safety precautions like CCTV cameras and tighter driver regulations which in turn has led to enhanced confidence and peace of mind during their trips. This corresponds with broader research which ultimately highlights that feelings of safety are a key contributor to the overall contentment of commuters (Mayo, et al., 2020).

7) Challenges and Recommendations for Implementation

Although the yield of the modernization initiative is impressive, obstacles remain. The unfair competition from the traditional jeepneys and the high initial cost of the E-jeepneys are still the drivers' concerns (Frisnedi, 2021; Sanchez, 2020; Malasique, 2022). Adequate financing and the constant development of infrastructure including the affordability of modernized vehicles and betterment of terminals (Frisnedi, 2021; Sanchez, 2020; Malasique, 2022) is the only solution to ensure long-term sustainability. According to the researchers, those insights constitute the priority focus of future efforts to deliver the Public Utility Vehicle Modernization Program in Valenzuela City in a successful and sustainable manner.

D. Framework Development

Proposed Framework Development for Improving the Effectiveness of Policies for Integrating E-jeepneys into Valenzuela City's Public Transport System

1) Background of the Proposed Framework Development

The City Government of Valenzuela is notably among the progressive cities that diligently comply with policies and mandates of the National Government, including the Jeepney Modernization Program (JMP). Being home to numerous jeepney drivers, the city government, through its Sangguniang Panlungsod, has promulgated an ordinance aimed at supporting them by providing financial assistance during the transition from traditional to modernized jeepneys. Additionally, the city actively solicits applications for participation in the Public Utility Vehicle Modernization Program (PUVMP) from numerous operational transport cooperatives. Despite these encouraging developments, certain transport operators, particularly those unable to upgrade their fleet, have expressed opposition to the program. Consequently, the primary objective revolves around leveraging the perspectives and insights of E-jeepney drivers and commuters. This aims to assess the socio-economic sustainability of the program towards Valenzuela City and institute improvements based on their experiences.

The proposed framework development aims to enhance existing frameworks rather than introducing a new one. This can serve as a guiding principle, utilizing the insights and experiences of E-jeepney drivers and commuters, to enhance the functionalities and capabilities of existing frameworks, therefore strengthening their overall effectiveness. It aims to introduce enhancements within the Jeepney Modernization Program, focusing on various aspects. These include upgrading the amenities in the vehicle, establishing new infrastructures prioritizing the health and comfort of E-jeepney drivers and commuters, establishing clear rules and regulations for in-vehicle conduct, and providing supplementary cash assistance for vehicle maintenance.

Furthermore, these enhancements align with Executive Order No. 125, s. 1987, which is also known as Reorganizing the Ministry of Transportation and Communications Defining its Powers and Functions and for Other Purpose. They also correspond with Administrative Order 202, s. 1987 or Creating the Land Transportation Franchising and Regulatory Board. These laws comprehensively regulate public transportation

matters, particularly land-based services, implementing standards, rules, and regulations for operators to integrate into their services, vehicles, and conduct. The departmental directive grants authorization and advocates for the use of safe, efficient, and environmentally friendly Public Utility Vehicles (PUVs).

Despite the City Government of Valenzuela's commendable adherence to the mentioned program, disagreements have surfaced. Operators facing financial constraints to upgrade their fleets are among the most impacted within the Public Utility Vehicle Modernization Program (PUVMP). The gradual replacement of outdated jeepneys might lead to unemployment among operators and drivers within the city. Addressing this concern involves crucially seeking the insights and experiences of frontline participants in the program - drivers and operators - with the indispensable input from its primary beneficiaries, the commuters. This approach aims to identify areas for improvement and formulate effective policies for integrating E-jeepneys into Public Transport Systems.

2) Key Areas for Action

The research findings underscore several crucial areas necessitating attention in the development of a policy framework. Firstly, addressing the competitive landscape between E-jeepney and traditional jeepney drivers is essential. Strategies must focus on mitigating rivalry to ensure fair market access and passenger distribution. Secondly, devising measures to alleviate the financial burden on operators concerning the substantial expenses for E-jeepney maintenance is crucial. Implementing support mechanisms or cost-effective solutions could aid in sustaining service quality. Additionally, enhancing passenger discipline and curtailing overcrowding within E-jeepneys are imperative. Introducing protocols to ensure fare compliance and manage vehicle capacity would enhance service efficiency. Lastly, formulating strategies to safeguard operators' earnings against fare evasions is critical for service continuity and facilitating improvements. Addressing these areas can lay the groundwork for a robust policy framework aimed at optimizing the Jeepney Modernization Program in Valenzuela City.

3) Problem Identification

The research highlights shortcomings in the execution of the Jeepney Modernization Program in Valenzuela City. These shortcomings involve the competition arising between E-jeepney and traditional jeepney drivers, as well as the considerable expenditure required for maintaining the E-jeepneys. Participants have conveyed that the ongoing rivalry significantly impacts the number of passengers they attract during their working hours. The city councilor's viewpoint aligns with the challenges perceived in the City Government's execution of the Jeepney Modernization Program (JMP). Additionally, the expenses incurred in maintaining the quality of this public transportation service have become a burden for these drivers. Conversely, from the perspective of E-jeepney commuters, there's a lack of passenger discipline and frequent overcrowding within the vehicle. According to the participants, certain commuters avoid paying the correct fare rate or sometimes evade payment entirely. Failure to adhere to these protocols can significantly impact the earnings of e-jeepney operators, making it challenging for them to sustain the service or implement improvements. Moreover, overcrowding the vehicle can lead to physiological and psychological effects on individuals' well-being.

4) Implementation of the Proposed Policy Enhancement

The Proposed Policy Enhancements are intended to be acknowledged and implemented under the authority of the Land Transportation Franchising and Regulatory Board (LTFRB). Their jurisdiction extends to franchises and other regulations pertaining to public utility vehicles. The City Government of Valenzuela shall then express its support to the improvements spearheaded by the former. The collaboration between central and local government agencies aims to reinforce the current policy framework and address the additional needs voiced by both E-jeepney drivers and commuters. This collaboration seeks to tackle the earlier-mentioned issues, including fare evasion and overcrowding for commuters, as well as the competition and financial burdens faced by drivers, particularly between traditional and E-jeepney operators. It serves as a guiding mechanism to introduce further amendments to the existing policy, thereby enhancing the socio-economic and political sustainability of E-jeepneys.

5) Stakeholders/Offices Involved in the Implementation

Identifying the roles of each government agency for the success of implementing this policy improvement is crucial. The Land Transportation

Franchising and Regulatory Board (LTFRB) holds a pivotal role in actualizing these enhancements, ensuring compliance with established regulations and facilitating their execution within the public utility vehicle framework. Next, the Sangguniang Panlungsod of Valenzuela City, under the City Government's umbrella, shall take lead in observing the enhancements which would be approved and implemented by the former. Their active participation would make the process seamless as they are the ones responsible for overseeing and ratifying the proposed improvements. They may also propose ordinances or strengthen existing ones for providing additional assistance to E-jeepney drivers. Finally, jeepney operators and drivers are expected to comply with the alterations set forth by both the LTFRB and Sangguniang Panlungsod. It is necessary upon them to ensure full adherence to these adjustments in their operations and conduct, facilitating smooth integration and strict compliance with the updated policies and regulations governing their roles in the public transportation system.

6) Monitoring and Evaluation

The expectations of E-jeepney drivers and commuters might undergo changes over time, depending upon several factors. These include the City Government's approach to program implementation, adherence of drivers or operators to proper conduct and vehicle operations, advancements in E-jeepney services, and evolving trends regarding fare rates or financial aspects of the program.

Even after the approval of this framework development, it remains imperative for the respective stakeholders to consistently adhere to the program with utmost excellence and accountability. Continuously monitoring the changes

influenced by the policy enhancements is crucial. Deliberately seeking the views and experiences of E-jeepney drivers and commuters remains essential to uphold the quality of public transportation services in Valenzuela City. In order to facilitate the needed changes for improving the existing policy, the following should be observed:

- Implement a monthly data collection system to gather the current perspectives and experiences of E-jeepney drivers and operators. This initiative will enable local leaders to closely observe the monthly opportunities and challenges encountered by these individuals in operating E-jeepney vehicles.
- Enact an ordinance to explicitly prohibit competition in accommodating passengers between traditional jeepneys and E-jeepneys. This measure aims to reduce tension between the two parties and potentially assist E-jeepney drivers in meeting their daily fare quotas.
- Meet the requirement for enhanced infrastructure, such as designated resting areas and frequent terminal sanitation, for the purpose of improving their welfare and protect their health while effectively fulfilling their responsibilities.
- Implementing an ordinance aimed at addressing the misconduct of specific passengers, particularly those who evade paying the correct fare rate or avoid payment entirely.
- Enforcing an ordinance to establish a maximum passenger limit for each E-jeepney. This measure aims to uphold the comfort and convenience of E- jeepneys. Additionally, it expands the capacity of E-jeepneys to accommodate elderly individuals or people with disabilities without causing discomfort from overcrowding.

The efficacy of this proposed policy framework development underwent validation through a range of quantitative and qualitative methodologies. Quantitative analysis involved distributing survey questionnaires to eligible key participants to gather pertinent data regarding their views and experiences relevant to the program. Conversely, qualitative assessments were conducted through interviews with designated key informants to assess the status and overall implementation of the program at the local level.

The evaluation of the policy enhancement's effectiveness will be carried out by the responsible members of the City Government of Valenzuela, particularly the Sangguniang Panlungsod. The committee overseeing this process will present a comprehensive analysis report to the policy implementer. Feedback on a policy is crucial for its maintenance or further implementation, hence facilitating an informed decision-making process. Hence, the implementation of all the aforementioned measures holds significant importance in enhancing the effectiveness of policies aimed at integrating E-jeepneys into Public Transport Systems.

5. Summary, Conclusions and Recommendations

This section discusses the Summary of Findings, Conclusions, and Recommendations formulated through the researchers' study entitled "Policy Implications of Incorporating E-jeepneys in the Public Transportation System: Lessons from Valenzuela City."

A. Summary of Findings

1) Implementation of the Public Transportation Modernization in Valenzuela City

Despite not having direct jurisdiction over public utility jeepneys, Valenzuela City has actively supported the PUV Modernization Program. Through Ordinance No. 819, Series of 2020, the City provides financial assistance to qualified traditional jeepney owners and operators. This assistance aims to help them meet the program's standards, organize themselves into cooperatives (a requirement for bank loans), and ultimately modernize their vehicles. By taking this initiative, Valenzuela City demonstrates its commitment to supporting the livelihoods of traditional jeepney operators and facilitating a smooth transition to the PUVMP.

2) Problems and Challenges identified by the Local Government

The modernization program of E-jeepneys in Valenzuela City faces a considerable problem characterized by elevated expenses on buying and improving vehicles. Therefore, fare rises can be implemented as well as economic pressure for all the parties, drivers, operators, and passengers. Moreover, some operators and drivers may not be able to afford the new requirements thereby losing their livelihoods. Among these challenges, a collaborative approach is sought. The options could be subsidies, phased implementation, public-private partnerships, retraining programs, job placement assistance and social safety nets. Through joint efforts of the government, financial institutions, private sector, and operators/drivers these challenges can be overcome and the program will come out successful to the benefit of all Valenzuela City residents.

3) Views and Experiences of E-Jeepney Commuters and E-Jeepney Drivers

According to the findings, E-Jeepney commuters from Valenzuela City exposed their opinions and experiences about PUV Modernization Program (PUVMP) shows an improvement of travel satisfaction which is evident in the comfort, convenience, and safety riding an E-Jeepney. Furthermore, commuters are ready to pay a higher fare for an improved system and consider modernization of jeepneys as necessary, revealing the acknowledgement of the need for modernization to advance public transportation. E-Jeepney drivers' attitudes toward the implementation of PUVMP in Valenzuela City express an optimistic view of the program as it contributes to their income and enhances the whole system of transportation in the city. The statement "The Jeepney Modernization Program will provide more significant relief" got the highest scores. Therefore, a strong consensus of agreement had been established on that issue. Mainly, E-Jeepney drivers' perspectives regarding the application of the public transportation modernization scheme in Valenzuela City are oriented towards affirmative position, accenting on the overall appreciative standpoint they have towards the program.

B. Conclusion

The E-jeepney modernization program in Valenzuela City has transformed the city's transportation landscape, bringing significant improvements for both commuters and drivers. Commuters appreciate the enhanced safety, accessibility, comfort, and convenience offered by E-jeepneys, but concerns remain regarding fare affordability, overcrowding, and station accessibility, due to the high cost of E-jeepney and its maintenance, the fare also increases. The drivers and fare collector allows commuters to ride even if the E- jeepney is already full, which makes it overcrowded. And also, E-jeepney stations and units are limited compared to the traditional jeepneys. Drivers benefit from increased income, improved working conditions, and enhanced safety, but face challenges related to the high initial investment and competition from traditional jeepneys. To ensure long-term success, further efforts are needed to expand financial assistance, regulate fare prices, launch public awareness campaigns, strengthen enforcement, and maintain City government support. These collaborative efforts will ensure the program's success and towards an efficient, sustainable, and accessible public transportation system for all in Valenzuela City.

C. Recommendations

Recognizing the challenges faced by Valenzuela City in integrating E- jeepneys, the researchers propose a focused approach built upon existing frameworks. This strategy leverages the valuable insights of drivers, operators, and commuters to enhance functionalities within the current PUV Modernization Program. Targeted improvements addressing financial constraints, infrastructure needs, in-vehicle conduct, and vehicle maintenance are recommended, ensuring alignment with existing regulations and prioritizing safety, efficiency, and environmental considerations.

Addressing the potential financial burdens and unemployment faced by operators and drivers is crucial. The researchers advocate for financial assistance mechanisms and skills development programs to mitigate these challenges. Fostering collaboration and transparency through open communication channels is vital, ensuring trust and understanding among stakeholders. Data-driven decision-making and continuous improvement, informed by feedback and performance monitoring, will allow the program to adapt and thrive.By implementing these recommendations, Valenzuela City can navigate the transition to E-jeepneys effectively, creating a more efficient, sustainable, and user-friendly transportation network for all residents. This approach, prioritizing stakeholder engagement, evidence-based decision-making, and continuous improvement, holds the key to a brighter future for public transportation in Valenzuela.

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