Analyzing the Implementation of the Public Utility Vehicle Modernization Program (PUVMP) to the Employment of PUV Drivers in the Philippines

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Abstract — *With the traditional ways of public transportation in the Philippines, the current transportation system has been deemed inconvenient to daily commuters and public utility operators - traffic congestion, lack of public vehicles for commuters resulting into longer transportation time and hassle rides, and the environmental problems that arises in the continuity of using polluting gas are the main reasons as to why Filipinos continue to demand for a better transport system. The rise of modern transportation promises effective solutions to address the recurring problem stated above. This study examines the implementation of the Public Utility Vehicle Modernization Program (PUVMP) on the employment of PUV drivers, especially the small operators who do not have the capacity to upgrade their vehicles. With the goal of the proposed program, this study aims to analyze and determine the significant effect of PUVMP to the employment of PUV drivers in the Philippines. The employment of PUV drivers decreased because of the ongoing health crisis, and there was a significant difference in the number of traditional PUV units since the modernized units are inadequate.*

Keywords — *Public Transport, Public Utility Vehicle Modernization Program, PUV Drivers, Employment*

I. INTRODUCTION

The Public Utility Vehicle Modernization Program (PUVMP) is a comprehensive system reform that was established in 2017 by the Department of Transportation with the goal of making the country's public transport system efficient and environmentally friendly in the succeeding years. PUVMP aims to modernize public fleets, improve franchise issue procedures, reform the planning and rationalizing of public transport routes, and promote industry consolidation and professionalization in order to enhance service levels. The Department of Transportation plans to prolong the quality and environmental sustainability of public transport vehicles and its operation for a transformative change in the country. With this being said, public transport vehicles with over fifteen years of service would be phased out, and all public utility operators are required to utilize their new vehicles in compliance with the Euro IV emissions standards and Philippine National Standards. There were regulatory reforms that were issued by the Department of Transportation such as new vehicle specifications, franchise issue procedures and practices for more systematic guidelines. Furthermore, new routes were also analyzed and compared with the traditional routes for an observation of how effective it is to assign routes for public utility vehicles. As the main agenda of this program was to modernize public fleets, the government implemented standards that are to be followed by the public utility operators and drivers.

With the implementation of the PUVMP, the employment for PUV drivers is affected in a way that it establishes job opportunities for them as it also abolishes their employment or their source of income. Since not every PUV driver can comply with the expenses of transforming traditional jeepneys to modernized jeepneys and obtain valid franchises due to problems in consolidating with corporations or cooperatives, it dramatically affects the employment of PUV drivers here in the Philippines. The transportation availability of the public modernized vehicles would affect the labor participation of PUV drivers since it is one of the factors for public service operations. While continuing to propose public transportation investments to address unemployment concerns, few studies have evaluated the relative impacts of employment accessibility that result from public transportation services. Public modernized vehicles that are not only available in urban areas but also in rural areas is an indicator that the PUVMP influences the employment of PUV drivers nationwide.

The primary aim of this study is to analyze and assess the implementation of PUVMP to the employment of PUV drivers in the Philippines. In addition, the main objectives of this study are the following: (1) to determine the number of valid franchises that are issued to a corporation or cooperative and the number of modernized public utility vehicle units that operate in different regions of the country from 2020-2021, (2) to determine if the employment for PUV drivers increases or decreases from 2020-2021 and (3) to identify the possible factors for the improvement of the PUVMP in relation to the employment of PUV drivers.

The significance of this study is to further understand the implementation of PUVMP and its implications to the country. This study can help to analyze and assess the said program to the employment of PUV drivers. Moreover, this study can benefit the future researchers as they explore the implementation of the program in different perspectives.

This study focuses on determining and assessing how the implementation of PUVMP affects the employment of PUV drivers. The data that are used to conduct this study are from the affected constituents of the said program. However, because of the present scenario and circumstances beyond the control of the researchers, the study limits its coverage on the availability of data and sources which are provided by the Philippine Government Agencies for public utility vehicles.

II. LITERATURE REVIEW

2.1 The Philippine Public Transport

The World Bank's Implementation Completion and Result Report (2011) notes that the average jeepney occupancy is 10.6 people and bus occupancy is 43.4 people. Simultaneously, there has been a need to move from monomodal travel which uses only one mode of transportation per trip to multinational travel which uses multiple modes of transportation per trip. This shift in modes promotes the long-term sustainability of transportation networks because each transportation mode would have its proper role and function. Guillen (2007) stated that the Philippines, like any other developing countries, faces challenges in the land transportation sector. Only the National Capital Region (NCR) has mass public transportation such as the LRT and MRT. The rest of the country relies on road-based vehicles, especially public utility vehicles (PUVs): buses, taxis, jeepneys, etc. The National Capital Region of the Philippines, Metro Manila faces severe traffic congestion (Numbeo, 2018). About 50% of the roads operate already at volume/capacity (V/C) ratios above 0.80 (ALMEC, 2014). For the baseline scenario, the average travel time for a single person trip was 1.17 hours in 2014 and will rise to 1.33 hours in 2030 (ALMEC, 2014). Currently, the entire daily transportation cost (operating and time costs) is PHP 3.5 billion, and if no government intervention is implemented, it will rise to PHP 5.4 billion by 2035 (JICA, 2018).

According to the Asian Development Bank (2012), road-based public transport in other urban areas in Metro Manila is provided entirely by the private sector. There are an estimated 433 bus companies operating 805 routes. Majority of the bus companies own more than 10 units; only 7 bus companies own 100 units or more. Jeepneys serve 785 routes in Metro Manila with several jeepney operators owning only one unit.

One of the most well-known examples of Filipino craftsmanship and art is the Jeepney. It has been referred to as a "moving form of street arts" and has been part of Philippine culture since its inception (Menez, 1988). Back in the American period, wherein a load of jeepneys left over by the American soldiers, the jeep's enculturation was one of the main modes of transport in the Philippines (Ines, 2017). As such, jeepneys can accommodate from 13 to 23 passengers, depending on the length of the body. Jeepney drivers often work long shifts which can last up to 18 hours if necessary. The length of the working hours is usually dictated by the owner of the unit and the earnings of the driver (Seva et al., 2011). It is in this matter that designing the structure of the jeepneys, both in terms of exterior and interior characteristics becomes a difficult task particularly when considering the overall safety and appropriateness of each relevant component that affects the drivers' working environment (Coz et al., 2015).

Jeepney will remain as the dominant carrier in every metropolis. It cannot easily be removed in the public transportation system because it provides livelihood to the drivers. Also, there is a strong existence of jeepney associations and cooperatives (Bacero et al., 2010).

2.2 The Implementation of Public Utility Vehicle Modernization Program (PUVMP)

One of the practical solutions to the problems in transport can be found in the development of sustainable public transport systems providing mobility, accessibility and customer service comparable to private vehicles. Sustainable transport systems are designed to improve the service quality, reduce pollution, limit the state subsidies to urban transport, increase the efficiency of transport networks and land usage, enhance the mobility of people with disabilities and prevent conflicts of interests among the public transportation stakeholders (Spirin, Zavyalov & Zavyalova, 2016).

The transportation system has a significant effect on regional patterns of development, economic viability, environmental impacts and socially acceptable quality of life. It is unsurprising that government agencies continue to invest significant resources in the preparation and development of more efficient transportation systems (Murray et al., 1998). The status of transport as public services and transport policy orientation should be identified by a basic law for transport as well as clarifying the developing direction of "innovation, coordination, green openness and sharing." Furthermore, it is suggested to establish a systematic, authoritative public transport policy-making procedure through legislation (Su, 2017).

Jeepney is one of the most popular modes of public transportation in the Philippines, as it is the primary means of transportation utilized by Filipino commuters to go to their destinations. However, the government decided to implement a modernization program in which old regular jeepneys would phase out and be replaced with modernized jeepneys due to issues such as a lack of maintenance system, ensuring the safety of passengers and drivers, negative environmental effects, and improper loading and unloading of passengers.(Andalencio et al., 2020).

Low-cost Transport Modes like Jeepneys involve a potentially wide range of policy and empirical issues. Despite the services and advantages that they offered, these modes had been the object of growing public criticism for transport and traffic problems attributed to them. However, appreciation of these modes had been increasing as a relatively cheap and flexible means of mobility for the urban masses, a major source of "informal" employment particularly for poor migrants to the city, and as an indigenous and potentially capital-saving adaptation of transport technology in the developing countries. Thus, there was a question whether these modes of transportation were not on balance, socially beneficial and should somehow be retained - perhaps with some modifications in their vehicles, their organization and operations, and their roles - and integrated in the urban transport systems that Asian cities were proposing to modernize (Ocampo, 1982).

In all of the case studies, it is clear that minibuses (in some form or another) play an important part in developing countries' urban public transportation. From the way these studies have been reported, it is evident that the role of smaller vehicles is a contentious issue including a conflict between users, operators and transportation planners (Vijayakumar, 1986). Certain strategies, such as transportation planning is required to ensure that the overall growth of metropolitan areas does not negatively impact the quality of life of individuals who dwell there (Kargarfard et al., 2015; Murray and Wu, 2003).

As most Asian and European countries continue to observe a systematic mode of transportation with cashless payment, timed bus schedules, limited passenger capacity, and organized manner of routes, their advanced transportation system makes their country more globally competent. The Philippines must keep up with the pace of modernization in the transportation sector. The development of a transportation system should come from a socio-economic context. Due to its extensive usage of infrastructure, the transportation sector is an essential part of the economy and a common tool for development. This is certainly relevant in today's global economy where mobility of people and freight, as well as information and communication technologies, have become more linked to economic prospects. There is a clear connection between the quality and quantity of transportation infrastructure and the level of economic development. High-density transport infrastructure and connected networks are typically associated with high levels of development (Rodrigue & Notteboom, 2018).

Due to the country's fast economic growth, the PUVs are expected to rise in numbers. Concerns about the sector's environmental, safety, and efficiency have led to the establishment of the PUVMP (DOTr, 2018), a program that seeks to transform the entire sector and modernize the public utility vehicles. It seeks to change the way the Philippines' current public transportation system operates, as well as its rules, business models, and cultural meanings (Sunio et al., 2019). The program incorporates different components: (1) regulatory reform, (2) local public transport route planning for local government units, (3) route rationalization, (4) fleet

modernization, (5) industry consolidation, (6) financing, (7) vehicle useful life program, (8) pilot implementation, (9) stakeholder support mechanisms and (10) communication. PUVMP entails the complete overhaul of a complex informal transportation infrastructure. It is a reform project to restructure the informal transportation industry, involving a wide range of stakeholders and a coevolution of institutions, business models, and behaviors (Mateo-Babiano et al., 2020). Considered as the flagship non-infrastructure project of the current administration, PUVMP is not only about the modernizing and smartening of all forms of public transportation (formal and informal), it is also about changing the way people think, act, and organize in the transportation industry (GIZ, 2019).

In 2017, the government launched the PUVMP which aspires to make the public transportation system more efficient and environment-friendly by phasing out old PUVs that are at least 15 years old, and replacing them with safer, more comfortable and more sustainable alternatives. These include electric jeepney, electric bus, electric tricycle and their EURO-4 diesel vehicles counterpart or better. The PUVMP aims to employ around 100,000 e-trikes annually and 200,000 e-jeepney in the next six years. Currently, the price of e-trikes ranges from USD 3,500 to USD 9,500 and USD 25,000 to USD 30,800 for e-jeepneys which are more expensive than their counterparts. To support operators and owners adopting the PUVMP, the government gives "5-6-7-8" financial incentives which include 5% subsidy for each unit of vehicle, 6% interest rate for purchase loan payable in 7 years and maximum PHP 80,000 (USD 1500) equity subsidy (Agaton, Collera & Guno, 2020).

With the implementation of PUVMP, operators are likely to consolidate ensuring better fleet management and more efficient and effective road usage. PUV drivers, on the other hand, will be paid a regular salary and will be given proper training, as well as other benefits. As a result, there is no need for drivers to work long hours in order to compete for passengers (Cerio, 2017). With these current operational characteristics of the jeepney industry, the fifth component of the modernization program - industry consolidation, it is envisioned that smaller transport industry players will be strategically merged to form cooperatives or corporations to facilitate the successful implementation of the program. Industry consolidation would entail requiring individual franchise holders to either join or form legal entities with assistance from the DOTr and its attached agencies such as the Office for Transport Cooperatives (OTC). These legal entities are expected to own, manage and operate the modernized fleet in an organized manner (Pontawe & Napalang, 2018).

In the case of PUVMP, a number of transport operators who lack the financial means to update their fleet are the ones who are most affected by the destabilizing processes. Sunio et al. (2019) claimed, "Transport groups represent the most active resistance to the jeepney modernization program." The "No to Jeepney Phaseout" Coalition was founded by a number of transportation organizations. For them, the PUVMP is all about phasing out old jeepneys, which means thousands of jeepney drivers and operators will lose their jobs across the country.

Most jeepney operators and drivers claim that a modernisation program is unnecessary since they cannot afford an updated unit. Meanwhile, passengers' perceptions of the planned financial and minimum fare are limited to the middle and working classes. All passengers chose the jeepney as their form of transportation because it was the cheapest in the country. Furthermore, the cost of a modernized jeepney was anticipated to be between 1.2 and 1.3 million pesos. As a result, the company alleged that government monies were used to fund the modernization effort. According to the stakeholders, improved jeepney characteristics would improve the transportation system. The company also claimed that the updated unit was better for the environment because the government mandated euro-4 engines, which cut pollutants in Metro Manila.

The stakeholders were concerned about the job losses induced by the upgrading initiative. Independent jeepney operators and drivers who did not have access to the upgraded vehicles had no choice but to continue operating. The cultural lineage of the jeepney, which will be erased once the jeepney modernisation is executed and seen, was the most significant reason impeding their full support for the program. If there was no discipline among jeepney drivers, jeepney modernization was not good for the country. Passengers expected world-class transportation with superior service and amenities like air conditioning, WiFi, GPS, and surveillance cameras. Half of jeepney drivers believe the Philippines is not ready for jeepney modernization, and the other half believe the program was implemented too late at the right time and price. (Andalecio et al., 2020).

However in 2021, during the ongoing health crisis, operations were halted by the government as per the rules of quarantine. Over 13 million Filipinos have lost their jobs or livelihoods during the COVID-19

pandemic. Tens of thousands of jeepney drivers have been displaced since March 2020 as they were no longer allowed to operate (Torres, 2021). Many drivers were begging and asking for financial assistance from the government, and hoping to drive again. Westernan (2018) stated that Jeepney drivers and operators do not earn a lot as earnings depend on factors such as profitability of the route, passenger volume and seating capacity. The government should study the program because low jeepney drivers cannot afford the new vehicles. This will result in joblessness and hardship for the jeepney drivers (Recio, 2020).

Varying social groupings have different resilience capacities, with the more vulnerable social groups often being the most affected. Existing negative externalities connected with home segregation and community effects could be exacerbated by the epidemic. According to Gutierrez, Miravet, and Domenech (2020), disadvantaged areas are more densely populated urban environments and are less permeable to physical distance requirements and changes in transportation networks, in addition to having a higher share of less qualified jobs. Avoiding public transportation could become a common practice, resulting in the marginalization of low-wage workers.

2.2.1 Significance of Fleet Management and Industry Consolidation

The quality of the fleet and its standardization in relation to maintenance activities and the elements that result in quality for the passenger and driver (e.g. rear engine, low floor, air conditioning, brake assist, automatic transmission) have a significant impact on the three sets of elements that make up the quality concept - for the user, shareholders (and taxpayers), and workers. The fleet's quality is determined by strategic decisions to sustain service excellence, not by system requirements or contractual obligations. Air conditioning, automated transmissions, and vehicles with rear engines have an impact on both service quality and worker activity (Brunoro et al. 2015).

Fleet management has become necessary for transport service delivery systems whether in the public or private sector. Fleet management can be seen as monitoring and increasing how efficient one can perceive a transportation fleet (Gitahi & Ogollah, 2014). It includes the management of vehicles like cars, ships, vans and trucks. A lot of functions are considered when it comes to fleet management including financing vehicles, maintenance of vehicles, vehicle telematics and driver shifting.

The primary aim of fleet management is to significantly decrease the risks associated with vehicle operation, efficiency, productivity and minimizing the transportation and staff cost entirely. Accordingly, Besiou et al., (2012) claim that a strategy that ensures sustainable fleet management is one that seeks to minimize environmental effect through the integration of cleaner vehicles and fuels, fuel efficient operation and driving; and by minimizing the quantum of traffic it creates on the road.

The results of the case study conducted by Pontawe et. al., (2018) shows that based on the experience of their team in modernizing their jeepney units, it can be concluded that fleet management and industry consolidation are both significant components of the DOTr PUV Modernization Program. The financial viability of modernizing the jeepneys would greatly depend on having efficient and well-managed operations of the new PUJ units. Findings prove that the bigger the fleet, the bigger the income, hence more financially viable PUV modernization. Fleet management shall be the core concept of the PUV Modernization Program. This would allow the industry to shift from boundary to fixed salaries, allow transport groups to purchase new vehicles without burdening individual operators about their creditworthiness, and would result in an increase in operational scale which will allow the fleet to acquire the necessary manpower (mechanic, dispatcher, conductors, safety officers, etc.) as fleet management results in lower operating costs; fuel, tire, spare parts, batteries.

According to Pontawe (2018), non-fiscal incentives and regulatory backstops are also important in making sure that modernization programs succeed. The provision of non-fiscal incentives such as low emission zones, exemption from coding, and tax waiver may entice jeepney operators to voluntarily or willingly modernize their old units. Meanwhile, regulatory backstops such as the imposition of a mandatory age limit would force owners of old and polluting vehicles to participate in modernization programs.

2.3 Employment

Better economic and social opportunities and advantages result from effective transportation networks in a country, which can magnify the good effects of better market access, employment, and more expenditures.

When transportation infrastructures are insufficient in terms of capacity or reliability, it can result in lost or missed opportunities, as well as a lower quality of life (Rodrigue & Notteboom, 2018). The development of sustainable public transport systems brings together engineers, researchers, marketing specialists, urban designers and customer service managers, social workers to produce innovative solutions to public transportation and help create universal strategies to global problems associated with urbanization (Spirin et al., 2017).

Creating new or improving existing public transit for communities that most need it can allow people to access the jobs they need while keeping costs manageable. By simply shifting our spending away from roads and highways and into public transit, we can create 20 percent more jobs without spending a single additional dollar. Putting transit in communities with high unemployment creates 2.5 times more jobs (Plano, 2015).

According to the American Public Transportation Association (2020), increased investment in public transportation can lead to significant economic growth as a result of both the short-term stimulus impact of public transportation outlays and a longer-term, cumulative impact on economic productivity.

Public transportation in the U.S. is funded by a combination of rider-paid fares, local/state revenue sources, federal funding, and other sources. To estimate the number of jobs supported just by federal investment in public transportation, it is necessary to recalculate the job figures using the specific spending mix that is applicable for federal funding. As previously noted, federal funding is focused on capital investment and preventative maintenance and by using the federal standard accounting system definition, this translates to 63% for capital expenses and 37% for operating expenses.

Capital investment in public transportation (including vehicle and equipment acquisitions and supporting facilities) is a substantial source of jobs. The analysis indicates that nearly 24,000 jobs are supported for a year, per billion dollars of spending on public transportation capital. In addition, public transportation operations (i.e. management, operations and maintenance of vehicles, and facilities) are also an important source of employment. For every billion dollars spent on public transportation operations, nearly 41,000 jobs are supported for a year (Weisbrod, 2009).

Many people in the United States also depend on public transit to get to work. Analysis of on-board surveys around the nation shows that 50 percent or more of transit users commuting to work did not have a car available for that trip. This implies that public transit provides a critical role in job access and likely supports employment in the United States.

In Brazil, transportation choices are made at levels that go beyond the company's exclusive influencing authority. Both criteria for the service supplied by corporations and conditions for financing operations dictate the scope of the company's investment as a result of historical issues and political decisions. They emphasize the preservation of good working conditions, equipment quality, maintenance and hiring practices, as well as flexibility to deal with numerous occurrences that could modify the course of operations in comparison to what was anticipated (Brunoro et al. 2015).

2.4 Synthesis

The published journal articles and related studies above present the background of PUVMP and its significance to the economy in terms of how it affects the employment of PUV drivers. As problems in the transportation system of the Philippines continue to arise, the program provides a lot of promising solutions in order for the country to develop a secured and convenient transport system which is linked to employment of PUV drivers. The valid franchises and the modernized public utility vehicle units which serve as the independent variables are part of the main focus for the related literature since these are the factors that affect employment. In addition, the employment levels and the reason for unemployment of the drivers are also included as part of the dependent variable. The COVID-19 pandemic is included in chapter II as it is one of the determinants affecting the employment level of drivers during the years of the implementation of PUVMP. As stated in the literature review, during the ongoing health crisis, operations were halted by the government as per the rules of quarantine. Over 13 million Filipinos have lost their jobs or livelihoods during the COVID-19 pandemic. Tens of thousands of jeepney drivers have been displaced since March 2020 as they were no longer allowed to operate (Torres, 2021).

As there are limited studies concerning how public transportation affects the employment level of PUV drivers in different countries, the related studies above focus on how public transportation affects the economy in terms of employment as a whole.

2.5 Simulacrum
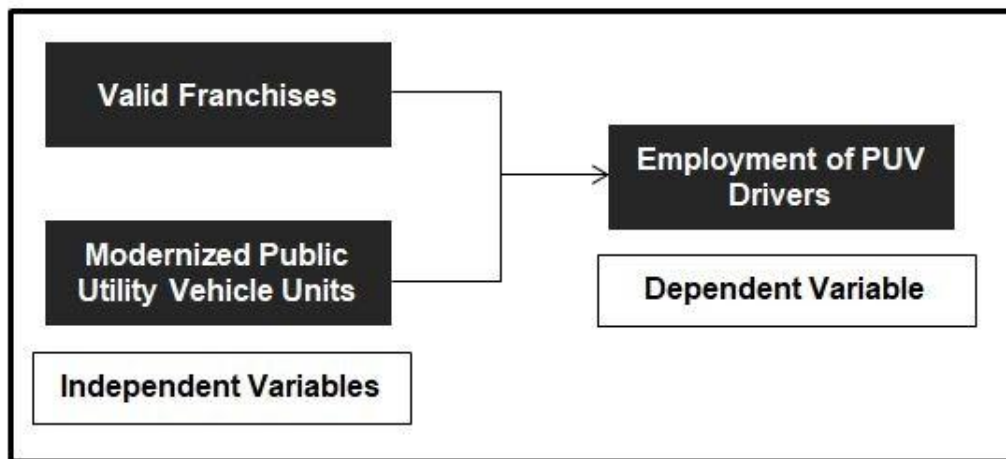
The research simulacrum directs the flow of study in terms of determining the impact between dependent variable (employment of PUV drivers) and independent variables (valid franchises and modernized public utility vehicle units). With this, the study suggests the following hypotheses in its alternative and null form:

- H1: The valid franchises have a positive impact on the employment of PUV drivers.
- H0: The valid franchises have a negative impact on the employment of PUV drivers.
- H2: The modernized public utility vehicle units have a positive impact on the employment of PUV drivers.
- H0: The modernized public utility vehicle units have a negative impact on the employment of PUV drivers.

III. METHOD

3.1 Research Design

In this study, various research methods were used to analyze the effect of the independent variables (Valid Franchises and Modernized Public Utility Vehicle Units) to the dependent variable (Employment of PUV drivers). According to the LTFRB, the modernization of PUV units refers to the new vehicle standards that are being developed which is based on comprehensive consultations with involved government agencies, jeepney associations, and local and international manufacturers. The variable was measured by the number of units that were modernized in different regions of the Philippines from 2020-2021. The LTFRB also defined that the valid franchises refer to the strategic merging of smaller transport industry players to form into a consortium either by forming corporations or cooperatives for the issuance of franchise for road-based public transport services. The variable was measured by the number of valid franchises that were issued to the corporations or cooperatives in different regions of the Philippines from 2020-2021. The 32 observations were obtained from the 2 years of the implementation of PUVMP and 16 regions. Furthermore, the employment of PUV drivers was measured from the share of drivers in modernized units that operate to the total number of PUV drivers.

The researchers used a quantitative approach to meet the primary aim and objectives of the study. The numerical data is essential for the justification of how such independent variables influenced the dependent variable.

3.2 Study Site

This study was conducted and analyzed in the Philippines. The data were collected from 2020 to 2021 in different regions of the country which were based on reliable sources such as the Philippine government agencies for public utility vehicles.

3.3 Data Collection Procedure

The researchers analyzed the data on the number of valid franchises that were issued to a corporation or cooperative and the number of modernized public utility vehicles as a direct result of the new regulatory requirements on vehicle specifications. Moreover, the data were inferred from various Philippine government agencies such as the Department of Transportation (DOTr) and Land Transport Franchising and Regulatory Board (LTFRB).

3.4 Data Analysis

In order to analyze the data that were provided by the government agencies, the researchers used descriptive statistics. Manikandan (2011) stated that the central tendency is defined as the statistical measure that identifies a single value as representative of an entire distribution. The measures of central tendency such as mean and median were used to provide an accurate description of the entire data and to analyze the patterns of the results. The mean and median depicts the characteristics of the data and presents insights across a large data set into bite-sized descriptions. The researchers also used other statistical tools such as dispersion statistics (i.e., variance, standard deviation and interquartile range) and shape statistics (i.e., skewness and kurtosis).

Bar graphs were used to compare the provided data. According to King (2018), graphs are the most effective way to visually summarize and highlight the findings of a study. Graphs allow readers to easily digest the results of a study or notice overall patterns. In addition, percentage change was also included to figure out the degree of change over time of the variables.

IV. RESULT AND DISCUSSION

This research used 32 observations from 2020-2021 in different regions and the Central Office in Quezon City as well. The data that were collected allow the researchers to meet the objectives of the study: (1) to determine the number of valid franchises and the number of modernized public utility vehicle units, (2) to determine if the employment for PUV drivers increases or decreases from 2020-2021 and (3) to identify the possible factors for the improvement of the PUVMP in relation to the employment of PUV drivers.

Table 4.1 Summary Statistics, using the 32 observations from different regions in the Philippines for 2020-2021

Variables	Mean	Median	Minimum	Maximum
Total Number of Valid Franchises	15177	7973	1743	54429
Valid Franchises for PUVMP	229	122	0	948
Total Number of PUV Units	23703	10731	2227	1.20E+05
Modernized PUV Units	140.19	49	0	647
Variables	**Std. Dev.**	**C.V.**	**Skewness**	**Ex. kurtosis**
Total Number of Valid Franchises	16506	1.0875	1.458	0.7874
Valid Franchises for PUVMP	250.63	1.0944	1.6344	1.7151
Total Number of PUV Units	27822	1.1737	2.0379	3.7502
Modernized PUV Units	193.99	1.3838	1.5532	1.0157
Variables	**5% Perc.**	**95% Perc.**	**IQ range**	**Missing obs.**
Total Number of Valid Franchises	1760.6	53951	18415	0
Valid Franchises for PUVMP	7.8	886.25	239.25	0
Total Number of PUV Units	2348.6	1.04E+05	28496	0

Modernized PUV Units	0	641.8	158.25	0

Table 4.1 shows that the mean for the total number of valid franchises is 15,177 while the average number of valid franchises for PUVMP is 229. In addition, the mean for the total number of PUV units is 23,703 and 140.19 for the modernized PUV units.

The standard deviation for the total number of valid franchises is 16,506 while the valid franchises for modernized PUV units are 250.63. Furthermore, the standard deviation for the total number of PUV units is 27822 and 193.99 for the modernized PUV units.

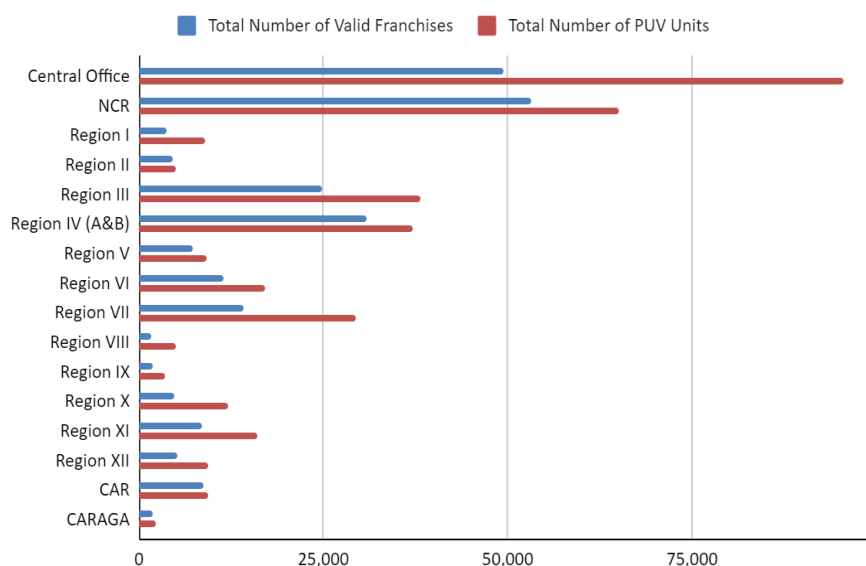**Graph 4.1** Total Number of Valid Franchises and Total Number of PUV Units for year 2020
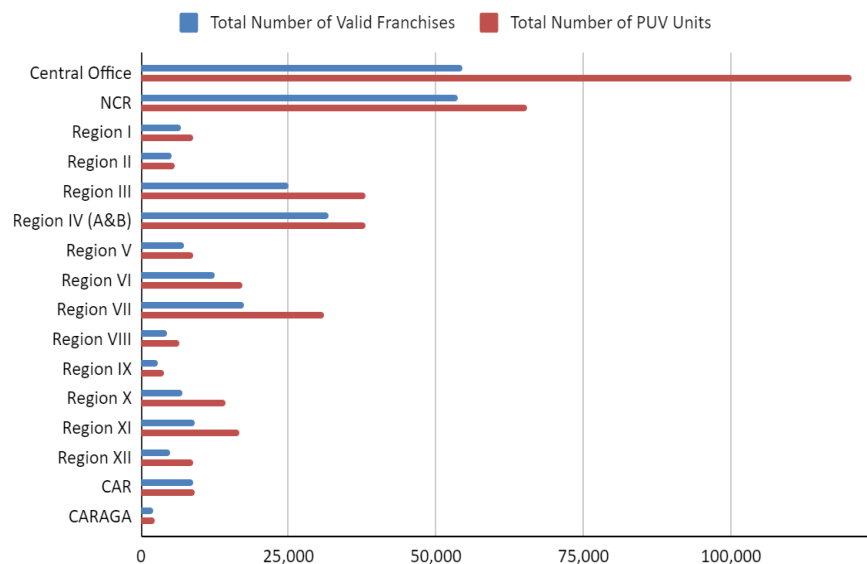
Graph 4.1 shows that in 2020, it can be observed that the Central office and NCR have the highest total number of PUV units and total number of valid franchises. On the other hand, Regions IX and CARAGA have the lowest total number of modernized PUV units and total number of valid franchises among all regions. Although Regions IX and Caraga have the lowest number of PUV units and valid franchises, Regions I, II, and VIII still have lower figures to be compared than other regions presented in the graph.

Graph 4.2 Valid Franchises for PUVMP and Modernized PUV Units for year 2020
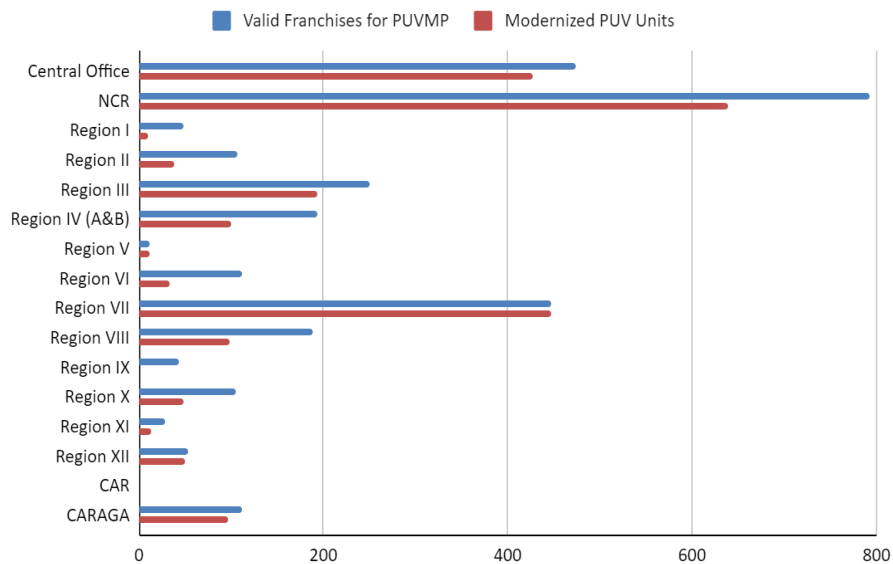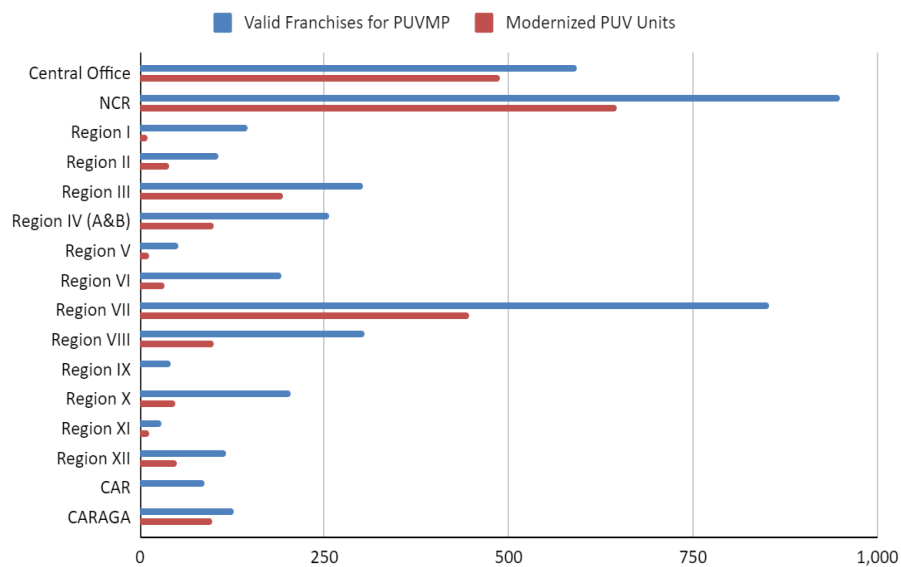
Graph 4.2 shows that in 2020, NCR, Region VII, and the Central Office have the highest number of modernized PUV units and the number of valid franchises for PUVMP. On the other hand, it can be observed that CAR has no modernized PUV units and no valid franchises that were issued for PUVMP and Region IX has no modernized PUV units. Further, Regions I, V, and XI have the lowest number of modernized PUV units and number of valid franchises for PUVMP.

Graph 4.3 Total Number of Valid Franchises and Total Number of PUV Units for year 2021

Graph 4.3 shows that in 2021, it can be observed that NCR and the Central Office still have the highest total number of PUV units and total number of valid franchises. While Regions IX and CARAGA still have the lowest total number of PUV units and total number of valid franchises among all regions. In addition, Regions I, II, VIII, IX, and Caraga also have lower figures to be compared than the other regions presented in the graph.

Graph 4.4 Valid Franchises for PUVMP and Modernized PUV Units for year 2021

Graph 4.4 shows that in 2021, NCR, Region VII, and Central office still have the highest number of modernized PUV units and the number of valid franchises for PUVMP. On the other hand, it can be observed that CAR and Region IX have no modernized PUV units. Further, Regions I, V, and XI have the lowest number of modernized PUV units and number of valid franchises for PUVMP.

Table 4.2 Percentage Change

Type of Service / Region	Total Number of Valid Franchises	Valid Franchises for PUVMP	Total Number of PUV Units	Modernized PUV Units
Central Office	9.23	**24.89**	20.64	**14.05**
NCR	1.02	**19.55**	0.61	**1.25**
Region I	46.14	**197.96**	0.92	0
Region II	10.36	**0.94**	12.86	0
Region III	0.73	**21.20**	**0.38**	0
Region IV (A&B)	2.81	**32.47**	0.22	0
Region V	**1.25**	333.33	**1.77**	0
Region VI	7.40	**70.54**	1.24	0
Region VII	19.07	**90.83**	4.76	0
Region VIII	60.11	**61.70**	21.92	0
Region IX	36.96	4.55	6.46	0
Region X	33.51	**95.24**	15.46	0
Region XI	4.59	**7.14**	3.11	0
Region XII	**1.45**	120.75	**4.83**	0
CAR	1.10	-	**1.48**	0

CARAGA	9.37	**13.39**	7.75	0

Note: Bold figures represent percentage decrease

Table 4.2 shows that it can be observed that the total numbers of valid franchises decreased except regions V and XII. While for the number of valid franchises for PUVMP, the percentage change increased except Region IX. Region VIII has the highest percentage of decrease while region III has the lowest percentage of decrease. In addition, it can also be observed that the number of valid franchises for PUVMP in all regions except region IX increased. For CAR, the number of valid franchises for PUVMP increased from 0 to 87 franchises. It indicates that there are no valid franchises that are issued in a one year period. Region XII has the highest percentage of increase, while Region II has the lowest percentage of increase.

As for the total number of PUV units, Regions III, V, XII, and CAR only have a percentage increase among other regions. Region VIII has the highest percentage increase, while Region IV (A&B) has the lowest percentage decrease. Moreover, only the Central Office and NCR have a percentage increase in the number of modernized PUV units. Almost all regions starting from Region I up to CARAGA have no percentage change since there are no modernized PUV units that are operating over the two-year period.

Table 4.3 Percentage of Valid Franchises Issued and Modernized PUV Units Operated in 2020 to 2021

Type of Service / Region	Year	Percentage of Valid Franchises (for PUVMP)	Percentage of Modernized PUV Units
Central Office	2020	0.87	0.35
	2021	1.20	0.51
NCR	2020	1.48	0.98
	2021	1.78	1.00
Region I	2020	0.72	0.11
	2021	3.99	0.11
Region II	2020	2.05	0.69
	2021	2.31	0.79
Region III	2020	1.00	0.51
	2021	1.22	0.51
Region IV (A&B)	2020	0.61	0.26
	2021	0.83	0.27
Region V	2020	0.17	0.13
	2021	0.71	0.13
Region VI	2020	0.90	0.20
	2021	1.66	0.20
Region VII	2020	2.55	1.44
	2021	6.00	1.52
Region VIII	2020	4.30	1.53
	2021	17.44	1.96
Region IX	2020	1.55	0
	2021	2.35	0
Region X	2020	1.48	0.34
	2021	4.35	0.40

Region XI	2020	0.31	0.08
	2021	0.35	0.08
Region XII	2020	1.05	0.56
	2021	2.29	0.53
CAR	2020	0	0
	2021	0.99	0
CARAGA	2020	5.73	4.02
	2021	7.18	4.36

Table 4.3 shows that CARAGA has the highest percentage of valid franchises for PUVMP in 2020, while Region VIII has the highest percentage for 2021. Meanwhile, CAR and Region V have the lowest percentage for 2020-2021. In addition, CARAGA has the highest percentage of modernized PUV units in 2020-2021 while Regions IX and CAR have the lowest percentage for 2020-2021 because there were no modernized PUV units in those regions.

V. CONCLUSION

Due to the lack of data from the initial year of the implementation of the PUVMP up until 2019, there were only 32 observations that were assessed and analyzed. The researchers found out that the number of valid franchises and the modernized PUV units that were operating in different regions from 2020 to 2021 were not sufficient to sustain the employment of PUV drivers due to the ongoing health crisis. As stated in the literature review, operations were halted by the government as per the rules of quarantine. Over 13 million Filipinos have lost their jobs or livelihoods during the COVID-19 pandemic. Tens of thousands of jeepney drivers have been displaced since March 2020 as they were no longer allowed to operate (Torres, 2021).

The employment of PUV drivers decreased because of the pandemic, and there was a significant difference in the number of traditional PUV units since the modernized units are inadequate. The number of valid franchises is bigger than the number of modernized units, which leads some franchises to have 2 or more units. Even though there are modernized units, it is hard to say if they are sufficient. Among all regions, only NCR had the most number of modernized units. It had to be developed in an urbanized area where a lot of people are finding convenient ways to commute from one place to another. Based on the data that the researchers found, it is hard to come up with the conclusion that the modernization of the PUV units was effective because; (1) the modernized puv units were insufficient, (2) urbanized areas were prioritized but still lacked in numbers than the traditional ones so the latter was still preferred and (3) the pandemic poses a threat to the livelihood of numerous Filipino PUV drivers and potential franchise holders since they cannot afford to purchase new modernized vehicles for their survival. This is because safety protocols include social distancing and limited vehicles for transportation. As modernized PUV units only increased for NCR and Central Office, the researchers can conclude that the reason why there are limited units is because the drivers cannot afford the new modernized ones and would rather stick to the traditional units since they had to pay a huge amount for a new project.

5.3 Recommendations

The researchers had come up with the following recommendations based on the given data and results in the study.

As the costs for loans are not attainable for many drivers and operators, the costs for acquiring a newly-operating modernized PUV unit should be reduced for drivers, operators, and private entities to procure such modernized vehicles that would benefit potential investors and drivers. With this, employment will increase for drivers and the number of modernized PUV units will increase.

Since one of the reasons for the implementation of PUVMP was to give efficient and reliable service to the public, the government should innovate and find a way to enhance the overall design of the units to increase the satisfaction of the commuters. As long as the satisfaction of commuters is met, the demand for Modernized PUV

units will increase. Thus, providing efficiency and effectiveness for all individuals is significant for such new modernized units.

Over the past years of the implementation of PUVMP, LTFRB and DOTr were the government agencies that were in charge of the said program. The institutional capacities at the Department of Transportation and relevant agencies (LTFRB, Office of Transportation Cooperatives, etc.) are visibly insufficient in comparison to the urgency and scale of the program, which has resulted in poor results over the past years. The Department of Transportation must increase its internal ability to execute and support the PUVMP on a long-term basis. If the numbers of the agencies increase, they will have more capacity to cater to the needs of the drivers, leading to more job opportunities.

The PUVMP has already concentrated on the jeepney industry, expanding the scope of the program to include both buses and jeepneys. However, it stands to reason for such an initiative to have a broader reach and to include buses. Many outdated buses must be replaced, and some jeepney routes must be converted to bus lines. Social dislocation should be strictly avoided, according to a general principle. As a result, if a jeepney route is upgraded to a bus route, the existing jeepney operators and drivers on the route should be given the choice to create a cooperative and should be given first priority in using the new bus services. The government should also make it easier for new bus cooperatives to form partnerships with established bus firms or consortia. When they expand the program to bus drivers as well, it would help increase the number of drivers in having a job.

When there is an effective transportation system available for commuters, the demand for Public Utility Vehicles will increase in order to cater to the people who need their services. Thus, further increasing job opportunities for drivers. There is a need for long-term solutions or plans for PUVMP in terms of financing. Ever since the pandemic has struck the country, the number of modernized PUV units declined, showing the fact that the government was not prepared in addressing the transportation system problems in catering to the needs of the commuters amid pandemic. If there was a proper plan in financing the PUV units, even if there was an ongoing pandemic, commuters and drivers alike would continue doing/availing the services, giving way for modernized units to be availed by commuters. This would then result in an increase for the employment of drivers if only modernized PUV units operated in times of crisis.

REFERENCES

[1]   Adriano, A., & Su, C. (2017). Out with the Old, In With the New: A Study on the Vehicle Hailing Preferences of Filipino Taxi Riders Based On Participation. Intent International Journal of Real Estate Studies.

[2]   Aflabo, J., Kraa, J., & Agbenyo, L. (2020). Examining the Effect of Fleet Management on Competitive Advantage in the Transport Industry. doi:10.37745/ejlpscm/vol8.no2.pp7-23.2020.

[3]   Agaton, C., Collera, A., & Guno, C. (2020). Socio-Economic and Environmental Analyses of Sustainable Public Transport in the Philippines. Sustainability, 12(11), 4720. doi:10.3390/su12114720.

[4]   American Public Transportation Association. (2020). Economic Impact of Public Transportation Investment. Retrieved from https://www.apta.com/wp-content/uploads/APTA-Economic-Impact-Public-Transit-2020.pdf

[5]   Andalecio, A., Aquino, K., Cruz, C., Guzman, A., & Kiong, N. (2020). Implementation, challenges and stakeholders perception of modernized Jeepneys in Metro Manila. Journal of Physics: Conference Series, 1529, 032067. doi:10.1088/1742-6596/1529/3/032067

[6]   Asian Development Bank. (2012). Philippine Transport Sector Assessment, Strategy and Road Map. ISBN 978-92-9092-855-3.

[7]   Bacero, R. & Vergel, K. (2010). Assessment of Jeepney in Metro Manila for the Development of Specifications and Standards. Retrieved from https://www.wctrs-society.com/wp-content/uploads/abstracts/lisbon/selected/01306.pdf

[8]   Bakker, S., Dematera Contreras, K., Kappiantari, M., Tuan, N., Guillen, M., Gunthawong, G., … Maarseveen, M. (2017). Low-Carbon Transport Policy in Four ASEAN Countries: Developments in Indonesia, the Philippines, Thailand and Vietnam. Sustainability, 9(7), 1217. doi:10.3390/su9071217.

[9]   Beltran, M. (2020). Philippines Government Driving Jeepneys off the Road. Retrieved from https://www.lowyinstitute.org/the-interpreter/philippines-government-driving-jeepneys-road

[10] Brunoro, C., Sznelwar, L., Bolis, I. & Abrahao, J. (2015). The Work of Bus Drivers and their Contribution to Excellence in Public Transportation. Production, 25(2), 323–335. doi:10.1590/0103-6513.114012

[11] Cerio, C. (2017). The Motorcycle Taxi Phenomenon in the Philippines: Is the Demise of Jeepney Possible? International Journal of Tourism & Hospitality Reviews, 4(1), 44-52. doi:10.18510/ijthr.2017.421.

[12] Coz, M., Flores, P., Hernandez, K., & Portus, A. (2015). An Ergonomic Study on the UP-Diliman Jeepney Driver's Workspace and Driving Conditions. Procedia Manufacturing, 3, 2597–2604. doi:10.1016/j.promfg.2015.07.584.

[13] De Gruyter, C., Currie, G., & Rose, G. (2016). Sustainability Measures of Urban Public Transport in Cities: A World Review and Focus on the Asia/Middle East Region. Sustainability, 9(1), 43. doi:10.3390/su9010043.

[14] De Torres, A. (2021). When Covid Meets Climate Injustice: Phasing Out Jeepneys and Driving Unemployment in the Philippines. Retrieved from https://medium.com/just-transitions/when-covid-meets-climate-injustice-phasing-out-jeepneys-and-driving-unemployment-in-the-b084bbf56d5b

[15] Espiritu, N., Felonia, J., Ayapana, M., & and Tus, J. (2021). Tatlong Gulong ng Buhay: The Tricycle Drivers and their Lived Experiences during the Pandemic. doi:10.6084/m9.figshare.13724491.v1.

[16] Francisco, K., & Helble, M. (2017). The Impact of Improved Transport Connectivity on Income, Education and Health: The Case of the Roll-On/Roll-Off System in the Philippines. ADBI Working Paper 792. Tokyo: Asian Development Bank Institute.

[17] Guillen, M. (2007). Public Transport Policies and the Road-Based Public Transport Service in Developing Countries: The Case of Indigenous Public Transport Modes in Davao City, Philippines. doi:10.11175/eastpro.2007.0.18.0.

[18] Güss, C., & Tuason, M. (2008). Jeepneys: Values in the Streets. Culture & Psychology, 14(2), 211–236. doi:10.1177/1354067x08088559.

[19] King, L. (2018). Preparing Better Graphs. Retrieved from https://jphe.amegroups.com/article/view/4288/5126

[20] LTFRB. Public Utility Vehicle Modernization Program. Retrieved from https://ltfrb.gov.ph/puv-modernization-2/

[21] Manikandan, S. (2011). Measures of Central Tendency: The Mean. Journal of Pharmacology and Pharmacotherapeutics, 2(2), 140. doi:10.4103/0976-500x.81920

[22] Mateo-Babiano, I., Recio, R., Ashmore, D., Guillen, M., & Gaspay, S. (2020). Formalising the Jeepney Industry in the Philippines – A Confirmatory Thematic Analysis of Key Transitionary Issues. Research in Transportation Economics, 100839. doi:10.1016/j.retrec.2020.100839.

[23] Mugion, R., Toni, M., Raharjo, H., Di Pietro, L., & Sebathu, S. (2018). Does the Service Quality of Urban Public Transport Enhance Sustainable Mobility? Journal of Cleaner Production, 174, 1566–1587. doi:10.1016/j.jclepro.2017.11.052.

[24] Munawar, A. (2017). Public Transport Reform in Indonesia: A Case Study in the City of Yogyakarta. World Academy of Science, Engineering and Technology, International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering 1: 77-82.

[25] Murray, A., Davis, R., Stimson, R., & Ferreira, L. (1998). Public Transportation Access. Transportation Research Part D: Transport and Environment, 3(5), 319–328. doi:10.1016/s1361-9209(98)00010-8.

[26] Narboneta, C., & Teknomo, K. (2016). A Study of Metro Manila's Public Transportation Sector: Implementing a Multimodal Public Transportation Route Planner. doi:10.11175/eastsats.4.460.

[27] Plano, C. (2015). More Jobs Created Through Public Transportation than Roads. Retrieved from https://mobilitylab.org/2015/01/22/more-jobs-created-through-public-transportation-than-roads/

[28] Pontawe, J., & Napalang, S. (2018). Examining the Potential Significance of Industry Consolidation and Fleet Management in Implementing the DOTr's PUV Modernization Program: A Case Study of 1TEAM. Philippine Transportation Journal.

[29] Ranis, R., Conquilla, J., Buncaras, Z., & Tus, J. (2021). The Jeepney Drivers and their Lived Experiences during the COVID-19 Pandemic: A Phenomenological Qualitative Study in the Philippines. doi:10.6084/m9.figshare.14033339.v1.

[30] Rappler. (2017). Transport Strike: Why Pick on Jeepneys to Fix Traffic Problems? Retrieved from https://www.rappler.com/nation/jeepney-strike-protesters-urge-against-disposing-of-outmoded-pujs

[31] Regidor, J. (2019). Current State of Transportation Data and Statistics in the Philippines and Opportunities for Improvement towards Usability. National Center for Transportation Studies.

[32] Regidor, J., & Napalang, M. (2018). Characteristics of Ridesharing as a Sustainable Transport Tool in Metro Manila. Sustainable Development Research in the Asia-Pacific Region, 377–390. doi:10.1007/978-3-319-73293-0_22.

[33] Rith, M., Roquel, K., Lopez, N., Fillone, A., & Biona, J. (2020). Towards More Sustainable Transport in Metro Manila: A Case Study of Household Vehicle Ownership and Energy Consumption. Transportation Research Interdisciplinary Perspectives, 6, 100163. doi:10.1016/j.trip.2020.100163.

[34] Sanchez, T. (1998). The Connection Between Public Transit and Employment. Center for Urban Studies Publications and Reports. 23. http://archives.pdx.edu/ds/psu/17881

[35] Rodrigue, J. & Notteboom, T. (2018). Transportation and Economic Development. Retrieved from https://transportgeography.org/contents/chapter3/transportation-and-economic-development/

[36] Seva, R., Axalan, J., & Landicho, A. (2011). Workplace Efficiency Improvement for Jeepney Drivers in Metro Manila. Ergonomics Australia – HFESA 2011 Conference Edition 2011 11:9.

[37] Siy, R. (2021). Moving Ahead With Public Utility Vehicle Modernization. Retrieved from https://www.manilatimes.net/2021/02/13/business/columnists-business/moving-ahead-with-public-utility-vehicle-modernization/840268

[38] Spirin, I., Zavyalov, D., & Zavyalova N. (2016). Globalization and Development of Sustainable Public Transport Systems. I-V. 2076.

[39] Sunio, V., Argamosa, P., Caswang, J., & Vinoya, C. (2020). The State in the Governance of Sustainable Mobility Transitions in the Informal Transport Sector. Research in Transportation Business & Management, 100522. doi:10.1016/j.rtbm.2020.100522.

[40] Sunio, V., Gaspay, S., Guillen, M., Mariano, P., & Mora, R. (2019). Analysis of the Public Transport Modernization via System Reconfiguration: The Ongoing Case in the Philippines. Transportation Research Part A: Policy and Practice, 130, 1–19. doi:10.1016/j.tra.2019.09.004.

[41] Vijayakumar, S. (1986). Optimal Vehicle Size for Road‑Based Urban Public Transport in Developing Countries. Transport Reviews, 6(2), 193–212. doi:10.1080/01441648608716625.

[42] Weisbrod, G. (2009). Economic Impact of Public Transportation Investment. Transit Cooperative Research Program (TCRP) Project J-11, Task 7

[43] Westerman, A. (2018). A Push to Modernize Philippine Transport Threatens the Beloved Jeepney. Retrieved from https://www.npr.org/sections/parallels/2018/03/07/591140541/a-push-to-modernize-philippine-transport-threatens-the-beloved-jeepney

APPENDICES

Appendix A: Compilation of Data

Type of Service / Region	Year	Total Number of Valid Franchises	Valid Franchises for PUVMP	Total Number of PUV Units	Modernized PUV Units
Central Office	2020	54,429	474	120,340	427

	2021	49,403	592	95,501	487
NCR	2020	53,694	793	65,399	639
	2021	53,144	948	64,998	647
Region I	2020	6,794	49	8,945	10
	2021	3,659	146	8,863	10
Region II	2020	5,174	106	5,667	39
	2021	4,638	107	4,938	39
Region III	2020	25,093	250	38,093	194
	2021	24,909	303	38,237	194
Region IV (A&B)	2020	31,820	194	38,151	100
	2021	30,926	257	37,104	100
Region V	2020	7,212	12	8,914	12
	2021	7,302	52	9,072	12
Region VI	2020	12,442	112	17,292	34
	2021	11,521	191	17,078	34
Region VII	2020	17,563	447	30,979	447
	2021	14,213	853	29,504	447
Region VIII	2020	4,370	188	6,482	99
	2021	1,743	304	5,061	99
Region IX	2020	2,838	44	3,807	0
	2021	1,789	42	3,561	0
Region X	2020	7,096	105	14,268	48
	2021	4,718	205	12,062	48
Region XI	2020	9,060	28	16,568	13
	2021	8,644	30	16,052	13
Region XII	2020	5,035	53	8,966	50
	2021	5,108	117	9,399	50
CAR	2020	8,855	0	9,216	0
	2021	8,758	87	9,352	0
CARAGA	2020	1,953	112	2,414	97
	2021	1,770	127	2,227	97

Appendix B: Formulas

Calculating Percentage Increase

$$Percentage\ Increase = \frac{Current\ Year - Previous\ Year}{Previous\ Year} \times 100$$

Calculating Percentage Decrease

$$Percentage\ Decrease = \frac{Previous\ Year - Current\ Year}{Previous\ Year} \times 100$$

Percentage

$$Percentage = \frac{Valid\ Franchises\ for\ PUVMP}{Total\ Number\ of\ Valid\ Franchises} \times 100$$

$$Percentage = \frac{Modernized\ PUV\ Units}{Total\ Number\ of\ PUV\ Units} \times 100$$