A Travel Demand Management Strategy: Public Transportation Reservation System among FPTT Student who Enroll when 2020/2021

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APPROVAL

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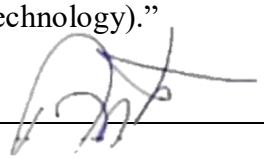
Signature : 

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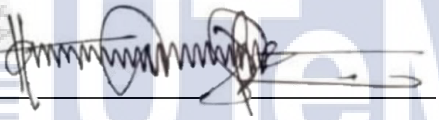
Signature : 

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A TRAVEL DEMAND MANAGEMENT STRATEGY: PUBLIC TRANSPORTATION RESERVATION SYSTEM AMONG FPTT STUDENT WHO ENROL WHEN 2020/2021

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DECLARATION

I declare that this thesis entitled "A TRAVEL DEMAND MANAGEMENT STRATEGY: PUBLIC TRANSPORTATION RESERVATION SYSTEM AMONG FPTT STUDENT WHO ENROL WHEN 2020/2021"is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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Date : 5th July 2023

DEDICATIONS

The following people and organizations deserve special thanks for their contributions to my academic career and the completion of this research, thus I dedicate this thesis to them. My devoted family, thank you for your everlasting support, inspiration, and faith in me. You have been the inspiration behind my academic endeavors. Your humor, and spiritual support have been priceless during this research journey, dear friends. I'd like to express my sincere gratitude to my supervisor, Ustaz Ismail bin Ibrahim, for his direction, mentoring, and knowledge. Your understanding, patience, and support have impacted my research and fostered my development as a researcher. Your commitment to my academic growth has motivated me to pursue excellence. We are very grateful to the research participants for their willingness to take part in and contribute to this study. Your invaluable contributions and cooperation have significantly improved the findings of this study and affected its conclusions. I dedicate this thesis to the innumerable academics, researchers, and trailblazers who have led the road in my field of study. Thank you for your commitment, groundbreaking work, and inspiration. It is thanks to your work that the foundation for this research was established, and it is my sincere hope that this research can help advance knowledge in our common field in some tiny manner.

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ABSTRACT

This study explores the connection between Transportation Demand Management (TDM) strategies and the inclination to use public transportation among Year 3 students from the Faculty of Technology Management and Technopreneurship (FPTT) at the University of Technical Malaysia (UTeM). With a rise in private vehicle ownership, understanding factors influencing transportation choices becomes critical. The research employs quantitative design, collecting data through a survey questionnaire distributed to 196 FPTT Year 3 students. The study investigates students' impact of increased private vehicle ownership, TDM strategies, and Public Private Partnership in Malaysia. Using inferential analysis techniques such as Multiple Regression and Pearson Correlation, the findings aim to illuminate the relationship between independent variables and students' intention to use public transportation. Identifying key factors influencing public transportation usage among university students contributes to understanding transportation behavior in an academic context.

ABSTRAK

Kajian ini meneroka perkaitan antara strategi Pengurusan Permintaan Pengangkutan (TDM) dengan kecenderungan menggunakan pengangkutan awam dalam kalangan pelajar Tahun 3 Fakulti Pengurusan Teknologi dan Keusahawanan Tekno (FPTT) di Universiti Teknikal Malaysia (UTeM). Dengan peningkatan dalam pemilikan kenderaan persendirian, pemahaman faktor yang mempengaruhi pilihan pengangkutan menjadi kritikal. Penyelidikan ini menggunakan reka bentuk kuantitatif, mengumpul data melalui soal selidik tinjauan yang diedarkan kepada 196 pelajar Tahun 3 FPTT. Kajian ini menyiasat kesan pelajar terhadap peningkatan pemilikan kenderaan persendirian, strategi TDM dan Perkongsian Awam Swasta di Malaysia. Menggunakan teknik analisis inferensi seperti Regresi Berganda dan Korelasi Pearson, dapatan ini bertujuan untuk menerangkan hubungan antara pembolehubah tidak bersandar dan niat pelajar untuk menggunakan pengangkutan awam. Mengenal pasti faktor utama yang mempengaruhi penggunaan pengangkutan awam dalam kalangan pelajar universiti menyumbang kepada pemahaman tingkah laku pengangkutan dalam konteks akademik.

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LIST OF SYMBOLS AND ABBREVIATIONS

TDM - Transportation Demand Management

ITS - Intelligent Transportation System

LRT - Light Rail Transit

PPP - Public-Private Partnership

ET - E-ticket

BRT - Bus Rapid Transit

CRS - Central Reservation System

POV - Privately Owned Vehicle

CHAPTER 1

INTRODUCTION

1.1 Introduction

An introduction is a component preceding something else, notably an explanatory segment positioned at the commencement of a book, report, or speech, serving to provide context, set the tone, and offer initial insights into the main subject matter. (*Oxford languages*. 2020, May 20). In recent years, the increasing number of population and traffic congestion have caused serious problems for transport systems around the world. The use of efficient Travel Demand Management (TDM) solutions has drawn a lot of attention as cities work to address these problems. TDM methods seek to increase use of efficient, environmentally friendly transport options while lowering reliance on personal vehicles. University students are one group that can gain a lot from TDM initiatives. Studying creative ways to encourage students to use public transport is essential given their frequent travel requirements and potential for significant car usage. The primary goal of this study is to apply a TDM strategy that has been specially designed for Year 3 students enrolling in the Faculty of Technology Management and Technopreneurship (FPTT) at Universiti Teknikal Malaysia Melaka (UTeM) in 2020/2021.

To increase the utilization of public transportation among FPTT students who enroll when 2020/2021 in UTeM, it is necessary to examine the viability and efficiency of a Public Transportation Reservation System (PTRS). The goal is to persuade students to use public transit as their main method of transportation when commuting to and from their hometown by implementing an easy-to-use reservation system.

Therefore, this chapter is a study about the background, problem statement, research objective, research question, scope of the research, significant of the research, limitation and summary that related to the TDM dan public transportation.

1.2 Background of study

Effective and accessible mobility is essential in today's fast-paced world, especially for college students. Finding your way through the public transportation system can frequently be difficult due to obstacles like crowded buses, erratic schedules, and lengthy wait periods. The adoption of a Travel Demand Management (TDM) strategy is essential to addressing these problems and improving the transport experience for Peninsula Malaysian college students. By creating a thorough public transit reservation system exclusively for nearby college students, this initiative hopes to revolutionize their travel experience and advance a smooth and effective transportation network.

In the realm of contemporary urban design, addressing the unique transportation needs of university students, particularly those engaged in regular commutes between their hometowns and the campus, is paramount. The observed recurring travel pattern among these students serves as a prime opportunity to delve comprehensively into Travel Demand Management (TDM) techniques. TDM, an innovative concept in transportation planning, seeks not only to mitigate prevalent issues such as traffic congestion, environmental pollution, and excessive energy consumption but also to revolutionize the predominant reliance on private vehicles. This approach hinges on increasing the adoption of sustainable modes of transportation, encompassing public transit, walking, cycling, carpooling, and teleworking. The overarching goal is not merely to reduce the total number of trips but to optimize the entire transport system, enhancing both efficiency and sustainability. A successful implementation of TDM necessitates concerted efforts and collaboration among various stakeholders, including government agencies, public institutions, employers, communities, and the individual students themselves. By delving into TDM strategies tailored to the specific travel patterns of university students, urban planners have the potential to usher in positive transformations, significantly

improving transportation efficiency, mitigating environmental challenges, and fostering a more sustainable and eco-friendlier urban environment.

A prestigious university with a diversified student body, Universiti Teknikal Malaysia Melaka (UTeM) is shelter to Year 3 students enrolled in the Faculty of Technology Management and Technopreneurship (FPTT) when 2020/2021. These students are traveling between their homes and the university campus frequently, which adds to traffic congestion and has an adverse effect on the environment.

The entire landscape of transport has changed recently because of technological developments and the expansion of ride-hailing services. Private automobile services like Grab and Uber (now called Grab) have grown in popularity because they provide convenient and adaptable transport options. However, these services' ownership, oversight, and service qualities set them apart from conventional public transit networks. On the other side, public transportation networks include a variety of publicly owned, governed, and run modes like buses, trains, and other shared transit options. They provide regular routes, schedules, and fares and are built to service a bigger population. The provision of affordable and accessible travel options for the general people is prioritized by public transport networks, which are often subsidized.

For one to evaluate the potential effects of implementing a TDM strategy focusing on a Public Transit Reservation System (PTRS) among UTeM FPTT student who enroll when 2020/2021, it is essential to comprehend the distinctions between private vehicle services like Grab and Uber and conventional public transit systems. The research aims to assess the viability and effectiveness of introducing a PTRS for these students' weekly travel between their hometowns and the university by considering their transport needs and preferences as well as the difficulties they encounter in accessing public transport.

A related technology tool called the PTRS enables customers to schedule and book their travels on public transport in advance, resulting in a smoother and more effective travel experience. PTRS is an online reservation system is a software application or platform that allows users to make reservations or reservations for various services or resources via the Internet. They simplify the booking process, automate booking confirmations, and often offer additional features such as online payment processing, real-time availability updates, and customer management features. Overall, online booking systems increase efficiency, enhance customer experience, and facilitate seamless booking transactions in a digital environment. This study aims to

identify the factors influencing Year 3 students' transport choices and evaluate the potential of a PTRS to promote the use of public transport for their weekly commuting by examining their perceptions, preferences, and travel behavior. It focuses on students in the Faculty of Technology Management and Technopreneurship.

Compared with more prosperous cities, the government should also pay attention to the development of rural urban areas, such as the expansion of convenient transportation such as Mass Rapid Transit (MRT) in Malacca, Johor, and Terengganu, so that students can also take MRT to and from school. This can not only reduce the time for everyone to go to and from school, but also reduce the number of cars on the road. Because when MRT can go directly to college, I believe everyone will be more willing to take MRT, LRT and other means of transportation to go to school.

Nowadays, land transportation in Malaysia is facing some problems such as traffic congestion. Major cities and busy areas in Malaysia are faced with increasing traffic flow, resulting in congestion problems. This may be due to the increasing number of vehicles, inadequate road infrastructure to cope with demand, and problems with road planning and design. There are also issues of driver safety and violations. Traffic violations and unsafe driving behaviors such as speeding, failure to obey traffic rules, drunk driving, etc. may occur on certain roads in Malaysia. These actions increase the risk of accidents and jeopardize road safety. Furthermore, construction and maintenance work also cause road congestion. During road construction and maintenance works, there may be traffic restrictions, confusion in construction zones and deterioration of road conditions. This may cause traffic congestion and inconvenience.

In the future, as the population continues to increase, the demand for cars will also increase accordingly. As a result, the situation of land traffic congestion is more serious. Therefore, TDM is necessary to be respected and actively promoted to solve this kind of traffic congestion problem. I suggest the following methods so that TDM can be implemented smoothly. First, encouraging partnerships between public transportation providers and private sector companies can help improve the overall quality of public transportation services. Second, encouraging partnerships between public transportation providers and private sector companies can help improve the overall quality of public transportation services. This situation can provide everyone to have a better arranged time, and there will be no public transportation delay event, which will increase the number of people waiting at the MRT station or station. This

can well stop the number of commuters in the morning rush hour. The third and most important point. I personally believe that the shortage of equipment is the reason for the short supply. So, increasing invest in infrastructure is a very necessary action. Governments and transportation authorities can invest in modernizing and expanding public transportation infrastructure to make it more efficient and accessible. This includes expanding and upgrading existing public transportation.

1.3 Problem statement

The main problem to be researched by the proposed study is the FPPT Year 3 student' intention to use public transportation. There is a huge problem with cases either their preferences or external factors that influence the FPPT Year 3 student' intention to use public transportation.

First, the adoption of sustainable transport principles in The National Transport Policy 2019–2030 (Ministry of Transport Malaysia, 2023) after decades of changes to Malaysia's planning guidelines, including the 1960s' massive road constructions, the 1980s' national car project, the early 2000s' development of contemporary public transport infrastructure. (Ministry of Transport, 2019). But the problem of increasing sharply in number of the private car ownership is due to the Malaysia's national car project was planned since the early 1980s. (Makoto,2021) because governments may provide subsidies, tax breaks, or other incentives to promote domestic car ownership. These measures can reduce the financial burden associated with purchasing and maintaining a private car, making it more attractive for individuals to own cars rather than relying on public transportation. This effort has encouraged people to acquire cars and, along with pro-car policies like subsidies and tax breaks, has led to a significant reliance on private vehicles as opposed to public transportation. As a result, it has a difficult time encouraging university student to use sustainable mobility options and dealing with their growing reliance on personal vehicles. The absence of an efficient and user-friendly mechanism for making reservations for public transport is one significant challenge they encounter. They are unable to use public transport conveniently and with confidence in the absence of such a system.

Frequency and punctuality of buses are also the problems that faced by

university student. According to article “Why public bus is a less attractive mode of transport: A case study of Putrajaya Malaysia” (Muhamad Nazri Borhan, Ahmad Nazrul Hakimi Ibrahim 2019) shows the number of bus trips is also seriously insufficient cause the limited availability and unpredictability of public transportation options for university students result in inconvenience and hinder their willingness to rely on public transport. According to Florida Planning and Development Lab (2004), there are two main factors that dominate other factors in determining customer satisfaction. First, the factors related to facility placement. If the location of bus stops is not prepared and built. It may hurt client safety and convenience while balancing the demand for efficient bus operation and dependable service schedule. Second, the layout of the facility does not emphasize how long clients will have to wait. These two factors have a significant impact on how well a convenient, comfortable, and secure transportation system is designed. These may be the potential problem that affect the student’ intention.

Students face challenges in accessing and utilizing sustainable transportation modes because of lack of awareness and information about public transportation services and routes poses significant barriers to students' ability to make informed choices regarding their transportation needs. As a result, students often resort to using private vehicles as their primary mode of transportation, contributing to increased traffic congestion and parking difficulties on campus. The reliance on private vehicles also leads to higher expenses for students, as they incur costs related to fuel, parking fees, and vehicle maintenance. (Kaliani Sundram, et al. 2021) Students' adoption of more environmentally friendly commuting strategies are hampered by their lack of knowledge about the various sustainable transportation solutions. This condition not only has a detrimental effect on the campus environment but also increases carbon emissions. (National Geographic Staff, 2019) In order to solve this issue, it is essential to increase students' knowledge of eco-friendly transport options and give them thorough information on the benefits of using public transit.

In conclusion, there are various factors that influence the students’ intention to use public transportation among FPTT students who enroll when 2020/2021 in UTeM. However, potential factors such as personal behavior and personal security are still needing further investigation study to understand the relationship with the intention to use public transportation.

1.4 Research Question

1.4.1 What are the challenges faced by the public transportation reservation system against the private car services?

1.4.2 What are the factors influencing university students' intention to use public transport, specifically focusing on the implementation of TDM strategies?

1.4.3 What are the factors of public private partnership (PPP) in Malaysia on student' intention to use public transportation?

1.5 Research objectives

1.5.1 To determine the impact of the public transportation reservation system against the private car services.

1.5.2 To examine the factors influencing university students' intention to use public transport, specifically focusing on the implementation of TDM strategies.

1.5.3 To identify the impact of public private partnership (PPP) in Malaysia on student' intention to use public transportation.

1.6 Scope of study

If we travel between the two sides of Malaysia it is either West Malaysia (Peninsular Malaysia) and East Malaysia, we need to use airplanes or water vehicles such as speedboats and boats. The current target of this project is college students studying in FPTT UTeM. Data collection will also be provided by current university students studying in FPTT UTeM to gather their opinions or satisfaction with the transportation system existing now. The scope of the project will not include non-

university public transport systems such as private car services and taxi. This research project will collect and analyze data through questionnaires to study the factors that the public transportation system lacks been used among FPTT students who enroll when 2020/2021 in UTeM.

1.7 Limitation

The study's design or methodology flaws, along with other shortcomings, play a critical role in shaping the interpretation of research results. These limitations, stemming from decisions made in the study's initial design, the methodology employed to establish both internal and external validity, or unanticipated challenges encountered during the research process, place constraints on the ability to generalize findings, apply them to practical contexts, or assess their broader applicability. According to the Research Guides at the University of Southern California (2022), potential constraints may arise both before and after the research is concluded. It is imperative to transparently acknowledge these limitations to guide future research efforts and provide insights for refining methodologies in subsequent studies. Recognizing and openly addressing these constraints not only fortifies the research's integrity but also contributes valuable insights for improving methodologies in future research endeavors.

The first limitation in this research is only based on a small sample size. This research only focusses on FPTT students who enroll when 2020/2021 in UTeM. Therefore, this project is hard to gain the total number of population student in FPTT UTeM. Either the student' data information from the lecturer given or every course name list in the FPTT we can access through the friend only. This is because there is not the data student analyze for the whole student who studies in FPTT UTeM. Furthermore, the time limit has also been one of the challenges in this research. Since Year 3 students are also facing Final Year Project researching now, they may not free to answer the survey. Besides that, the study's conclusions and recommendations depend on the availability and quality of data, which may be challenging to obtain accurately. Data limitations can affect the accuracy and reliability of the research findings among the university students studying in Peninsular Malaysia.

1.8 Significant of research

The articulation of a study's importance in written form serves as the foundational rationale justifying the necessity of the research. This explanation acts as a robust defense of the study's significance, elucidating its potential impact on the research field, its novel contributions to knowledge, and its broader implications for aiding others in the academic community. Whether it be a researcher perusing a peer-reviewed journal article, an academic evaluating a PhD thesis, a funding entity scrutinizing an application, or another research team seeking insights, the reader's comprehension of the study's importance and justification is paramount. The narrative should intricately convey the research's relevance, the unique contributions it has made, and the inherent academic advantages, forming an integral aspect of the scholarly discourse (DiscoverPhDs, 2020). The study can help university students become more knowledgeable about sustainable mobility options. The purpose of the study is to encourage a change in commuter behaviors that are more environmentally friendly and sustainable by emphasizing the advantages and benefits of taking public transport. This may result in lower carbon emissions, better air quality, and a more environmentally friendly campus atmosphere. Students may experience financial strain because of their reliance on personal vehicles due to costs associated with fuel, parking, and vehicle upkeep. Students may be able to lower their commuting expenditures by using public transit, making education more accessible and cheaper. The PTRS can also offer opportunities for reduced fares or discounts tailored specifically for students, further encouraging the use of public transport.

The study's results can provide officials at the institution, those who oversee transport policies, and other relevant parties with useful information. Planning for infrastructure, service delivery, and the formulation of transportation policy can all benefit from an understanding of the difficulties, preferences, and elements that affect students' propensity to use public transportation. The study can help with the use of evidence-based decision-making and the adoption of successful ways to improve the transport network both inside and outside of the university. The project especially targets Year 3 students in FPTT UTeM with the goal of encouraging university students to use public transport. The project aims to reduce traffic congestion problems brought on by rising car usage by encouraging students to use public transport instead of private vehicles. This may lead to a more effective and environmentally friendly mobility

system for students and visitors to the university and its surroundings.

1.9 Summary

In conclusion, this chapter has introduced the study on the implementation of a Travel Demand Management (TDM) strategy for Year 3 students in the Faculty of Technology Management and Technopreneurship (FPTT) when 2020/2021 at Universiti Teknikal Malaysia Melaka (UTeM). The background of the study highlighted the increasing population and traffic congestion as major challenges for transport systems worldwide, emphasizing the importance of efficient TDM solutions. The problem statement identified the main issues faced by FPTT Year 3 students in using public transportation, including the lack of a user-friendly reservation system, limited availability and predictability of transportation options, and the lack of awareness and information.

The research objectives were outlined to determine the challenges faced by the public transportation reservation system compared to private car services, analyze the factors influencing students' willingness to use public transport, and identify the reasons for the lack of awareness and information about available public transportation options. The research questions were formulated based on these objectives.

The scope of the study was defined to focus on utilization of public transportation reservation system among FPTT students who enroll when 2020/2021 in UTeM. The limitations of the research, such as the small sample size and potential data availability issues, were acknowledged.

Lastly, the significance of the research was emphasized in terms of addressing the challenges faced by students in using public transportation, promoting sustainable mobility options, and contributing to new knowledge in the field of TDM. Overall, this study aims to provide valuable insights and recommendations to improve the utilization of public transport among Year 3 students at FPTT UTeM.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The influence of population size on travel demand is a noteworthy observation highlighted by the OECD library (2021). This underscores the anticipation of a global surge in transportation demand in the forthcoming decades, propelled by the continuous growth of the world population. Notably, data from the Macrotrends website (Figure 1) indicates a notable increase in Malaysia's population, soaring from 32,399,271 to 34,308,525 between 2018 and 2023. Concurrently, Figure 2 illustrates a significant rise in the total number of registered vehicles, surging from 16,230,607 in 2018 to 17,728,482 in 2021. This escalation emphasizes the imperative for Transportation Demand Management (TDM) strategies to regulate the burgeoning number of vehicles on the road. Key TDM measures, such as the elimination of fuel subsidies, the implementation of fuel taxes, and revisions in the bases for car taxation, are essential strategies to curb congestion. Specifically, the strategy of eliminating fuel subsidies and imposing fuel taxes aims to deter car ownership intentions by making fuel costs less affordable for a significant portion of the population. Unfortunately, in 2020, the world ushered in a big crisis-Covid-19. (Huang et al., 2020).

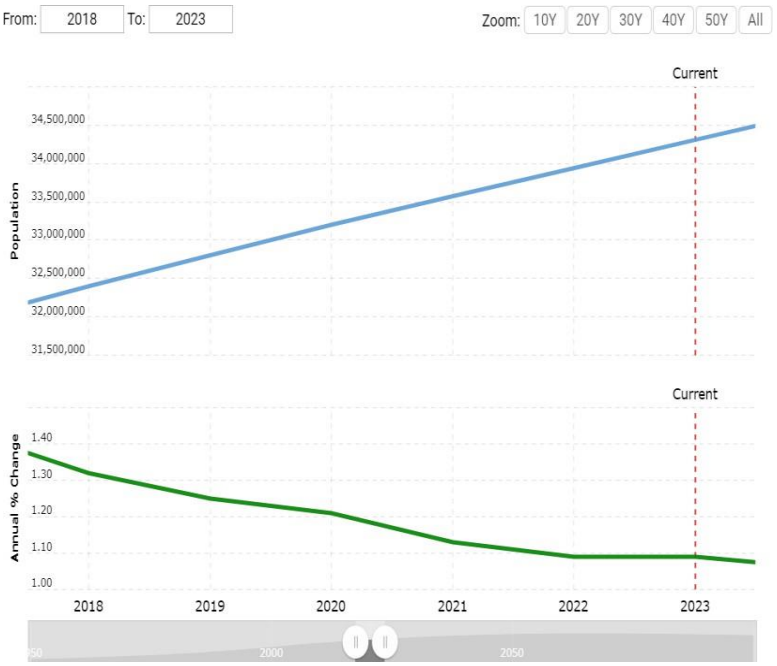

Figure 2.1: Total Population in Malaysia from 2018-2023

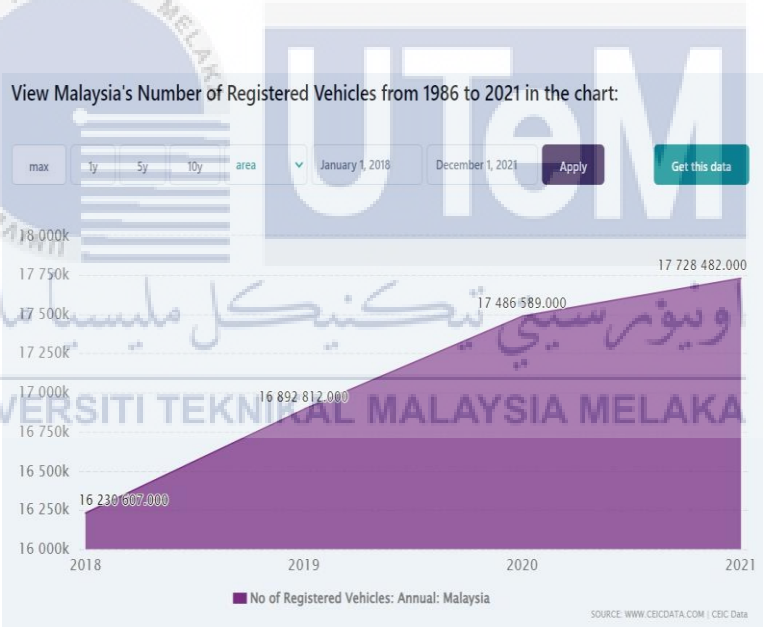

Figure 2.2: Number of Registered Vehicles

In comparison to private vehicles and other modes, public transit was struck particularly badly, according to a recurring trend that emerged from the effects of Covid-19. This raises questions about the viability of urban travel and the future of public transport. Although the current collision of issues, trends, and upheavals makes the future harder to predict. The lockdowns imposed due to the pandemic, along with restrictions on using public transport and concerns about crowding, have influenced individuals to curtail their travel and transition to alternative modes. Emerging trends

like reduced commuting and financial hardship will probably continue to have an impact on public transit for many years to come. The pandemic, along with the resulting conduct and difficulties that have been uncovered as a result, can, however, be seen as a call for significant adjustments to urban mobility design. (Erik Jenelius, 2022). A plan is needed to increase mass use of public transportation during the recovery now from the pandemic. While reducing carbon emissions, it can also promote the development of industry.

After the epidemic, the public has suffered from crowd phobia. They naturally avoid crowds, which also leads to their fear of taking public transportation. At the same time, this has also led to an increase in the number of private cars. To encourage the public to use public transportation, the government should implement more programs to increase the attractiveness of the public to use public transportation. In the moment, the E-ticket is a new technology emerging after covid-19. People can buy E-ticket through the public transportation reservation system such as Redbus, BusOnlineTicket, Myrapid, easybook and so on. Besides that, I believe the government must do more policy to reinvesting in public transportation for encourage people to use public transportation.

2.2 Private Vehicle Ownership

Private vehicle ownership has experienced significant growth and has become a dominant mode of transportation in many cities worldwide, including Kuala Lumpur (Mohamad & Kiggundu, 2007; Shaffi & Musa, 2008). This rise in private car ownership has resulted in several challenges, such as increased traffic congestion, environmental pollution, and the need for extensive infrastructure development (Shaffi & Musa, 2008).

Numerous studies have examined transportation mode preferences in situations where private cars hold a strong market position, while non-motorized modes like walking and bicycling have limited roles (Golob & Hensher, 1998; Dev & Biswas, 2020). In these contexts, public transportation emerges as the natural competitor to private cars. Researchers have explored various strategies to encourage consumers to choose public transport more frequently. Golob & Hensher (1998) and Allen & Meyer (1990) have emphasized that one effective approach is to increase the cost of driving

while simultaneously reducing the overall attractiveness of private car usage.

One key argument in favour of private car usage is the perception that it offers a faster commute compared to public transportation. However, this perception may not always align with reality. Many cities face traffic congestion and other issues that make driving increasingly challenging, leading to longer travel times and increased fatigue (Shaffi & Musa, 2008). In contrast, public transport systems are often designed to navigate congested areas more efficiently, offering potential time savings during peak travel hours (Golob & Hensher, 1998).

When considering the costs associated with transportation, particularly for families, the perceived higher expenses of using public transport compared to individual car tickets may influence mode choice. The number of vehicles on the road increases, so does the utilization of public transport will decrease. (Srichuae et al., 2016). In this regard, the convenience and affordability of public transportation can become more appealing, especially when traveling with multiple family members or for specific purposes such as school commutes or family gatherings (Srichuae et al., 2016).

Moreover, various factors have influenced personal travel patterns over the past two decades. These factors include increasing car ownership rates, the issuance of driver's licenses, income growth, and reductions in the real cost of owning and operating a car (Friman et al., 2017). These trends have contributed to a higher reliance on private cars for daily commuting and transportation needs.

In summary, the rise in private vehicle ownership has presented challenges such as traffic congestion and environmental issues. Previous studies have examined transportation mode preferences, with public transport emerging as a competitor to private cars. Efforts to promote public transport usage have focused on increasing driving costs and reducing the appeal of private car usage. The perception of faster commutes by car may not always align with reality due to traffic congestion and other challenges. The perceived higher costs of using public transport, particularly for families, may influence mode choice. Factors such as increasing car ownership, driver's licenses, income growth, and reduced car ownership costs have influenced personal travel patterns in recent years.

2.3 Travel Demand Management (TDM)

The use of techniques and policies to minimize travel demand or to redistribute this demand in geography or time is known as transportation demand management, traffic demand management, or travel demand management (TDM). (Nelson, Donna C., ed. 2000). According to (C. Black; E. Schreffier, 2010) experts in transportation experts contend that Transportation Demand Management (TDM) is often misconstrued as a mere amalgamation of loosely connected projects, leading to the curtailment of its full potential. TDM practitioners have discerned that its effectiveness is heightened when perceived as a philosophical approach integral to the foundation of sustainable urban transport systems. Evidently, a novel paradigm in transportation planning, globally recognized as TDM, is emerging. This paradigm encompasses concepts such as "mobility management" and "active travel management."

Travel demand management has two goals. The first is to encourage efficient modes of transport means that use less road space per passenger kilometer in purpose of increasing the useful capacity of existing infrastructure; the second is to shift inefficient modes of travel to off-peak hours to ease congestion. (The Online BRT Planning Guide). Travel Demand Management (TDM) is to reduce travel costs and congestion. TDM initiatives aim to spread travel demand throughout the day, alleviating congestion during peak hours and making travel more efficient. By promoting alternative transportation modes such as public transit, carpooling, or cycling, TDM helps individuals save money on transportation expenses. The objective is to create more sustainable and cost-effective transportation systems that improve the overall travel experience and reduce congestion on roads. (Victoria Transport Policy Institute, 2017). Therefore, there are some TDM strategy that practicing or practiced through：

2.3.1 Elimination of Fuel Subsidies

Subsidies are implemented with the intention of protecting consumers by ensuring affordable prices. However, these subsidies come with substantial costs. They impose a burden on public finances and often fail to effectively target the intended

beneficiaries, as they primarily benefit higher-income households. By phasing out subsidies and reallocating the resulting revenue towards more targeted social spending, reductions in inefficient taxes, and productive investments, sustainable and equitable outcomes can be promoted. Additionally, the removal of fossil fuel subsidies would address concerns surrounding energy security, as it would reduce dependence on volatile fossil fuel supplies (International Monetary Fund, 2022).

From my perspective, the elimination of subsidies can contribute to reducing congestion on land traffic for the following reasons:

1. The removal of fuel subsidies would significantly increase the cost of private vehicle usage for the general population. As a result, people would be more inclined to opt for public transit as a transportation mode to mitigate the financial strain caused by higher petroleum prices.
2. People tend to choose methods that offer higher benefits while minimizing costs. With the increased expense associated with private vehicle usage, individuals would be motivated to explore alternative modes of transportation, such as public transit, to avoid the financial burden.

However, it is important to acknowledge that eliminating fuel price subsidies alone cannot be viewed as a cure-all solution for land traffic congestion. Firstly, the mentioned gasoline subsidy does not effectively address the needs of the poor, as vehicle ownership is often unattainable for them. Secondly, higher gas prices may gradually reduce people's inclination to travel, potentially impacting economic activity. Lastly, the elimination of fuel price subsidies may impose significant operational costs on businesses. It is crucial to consider these factors as they can have indirect effects on the country's economic development.

2.3.2 Creating a More Efficient and Attractive Environment.

The Online BRT Planning Guide highlights the increasing presence of both free and paid parking lots, which has contributed to a gradual reduction in road traffic. Consequently, the removal of on-street parking is often essential for the successful implementation of Bus Rapid Transit (BRT) lines. However, beyond meeting the operational requirements of the BRT service, the removal of parking spaces can further

encourage the use of public transport by reducing the overall availability of parking along public transport corridors.

In areas where on-street parking restrictions are inadequately enforced, the formally designated parking spaces may only represent a portion of the total on-street parking supply. In such cases, the use of physical structures like high curbs and bollards may be necessary to prevent motorists from encroaching onto sidewalks. Alternatively, incorporating trees or other elements of urban streetscaping can serve as an aesthetically pleasing and effective form of protective barrier.

Moreover, some countries have creatively utilized bicycle parking facilities as functional bollards, offering an additional transportation demand management (TDM) amenity. By employing various strategies such as mixed- traffic lanes, bicycle lanes, footpaths, parklets, and streetscaping, the spaces freed up from parking can serve multiple purposes when they are not utilized as BRT lanes. This approach not only enhances the functionality and attractiveness of the transportation corridor but also promotes sustainable mobility and active transportation options.

2.3.3 Improving Bus Stop Infrastructure

For various user groups, different improvements to the bus stop infrastructure are necessary. However, both user groups have stated their grave concerns about the state of three important critical components, including bus stop shelters, bus stop amenities, lighting, and security, in terms of the current service condition. In this regard, an immediate response is required through the improvement of infrastructural facilities, such as the construction of a new bus shelter if one does not already exist at the designated bus stop location, the expansion of the interior space and seating capacity within a bus stop shelter, the creation of seating facilities that are roomy enough to offer a comfortable seating experience, etc. In this regard, it is important to note that some earlier studies (Lusk, 2002; Yavuz et al., 2007) also emphasized the significance of bus stop shelters with seating facilities, which could be seen from the surroundings to maintain positive interaction between waiting bus passengers and bus service. (Debasis Basu, Subhojit Roy et. 2020)

2.4 Public Private Partnership (PPP) in Malaysia

The involvement of the private sector in Malaysia's national development efforts has been a longstanding practice. Starting from the Fourth Malaysia Plan (1981-1985), the government introduced the Privatization Policy in 1983 as part of the New Public Management (NPM) initiative. The objective was to foster economic growth, reduce the government's financial and administrative burden, decrease its intervention in the economy, curtail public spending, and enhance efficiency and productivity through market forces. The Privatization Policy was continued until the Eighth Malaysia Plan (2001-2005), which emphasized initiatives aimed at creating a multiplier effect and improving access to services for the population (Eight Malaysia Plan, 2000).

In the Ninth Malaysia Plan (2006-2010), the privatization strategy was refined through the introduction of the Public-Private Sector Partnership (PPP) scheme. The primary objective was to encourage greater private sector participation in government projects (Ninth Malaysia Plan, 2006). While privatization involved transferring activities from the government to the private sector (Seventh Malaysia Plan, 1996), the PPP focused on transferring the responsibility for financing and managing capital investment and services to the private sector (Ninth Malaysia Plan, 2006, p. 230). Although both fall under the umbrella term of "PPP," privatization and the PPP possess distinct characteristics (Abdul Rashid, 2013). The Tenth Malaysia Plan (2011-2015) underscored the collaboration between the public and private sectors in delivering public infrastructure and services.

The PPP diverges from other approaches such as privatization and conventional procurement methods due to its unique characteristics (PPP Guidelines, 2009). These distinctions arise from the public sector's involvement in the PPP model, where the government acts as both the primary buyer and regulator of projects. Furthermore, the PPP's distinguishing features include a focus on customer service, ownership, risk transfer, innovation, and performance. Funding, impact on the public sector, risk allocation, public sector participation, contract duration, and project applicability differentiate the PPP from other procurement strategies (PPP Guidelines, 2009). To enhance the efficiency of the public sector delivery system, the government implemented a performance-based payment system linked to Key Performance Indicators (KPIs) for all PPP projects (Ninth Malaysia Plan, 2006).

According to a literature review by John Dudovskiy (2013), the private sector

outperformed the government sector in various aspects such as queuing, service speed, and service quality. Thus, implementing public transportation and an online reservation system under the PPP framework is expected to significantly enhance customer satisfaction. With the PPP approach, immediate adjustments can be made at the outset of new government policies. The PPP plays a vital role in facilitating and amplifying private sector actions, as recognized in a joint statement. The shared goal among partners is to expand private sector engagement through investment, capacity building, inclusive business models, knowledge exchange, innovation, and contributions to policy discourse. Additionally, creating a more favorable environment for private enterprise, domestic market expansion, international trade involvement, capital investment, and maximizing human capital's potential is emphasized (4th High-Level Forum on Aid Effectiveness, 2011).

The implementation of Public-Private Partnerships (PPP) in public transportation systems directly impacts students' intention to use public transportation. PPP models prioritize service quality, innovation, affordability, and multi-modal integration, creating a transportation environment aligned with students' needs and preferences. By emphasizing service quality and customer satisfaction, PPP models improve cleanliness, comfort, reliability, and timeliness – factors crucial for students when selecting transportation options. The involvement of private sector expertise and resources brings innovation and operational efficiencies that directly benefit students, with real-time tracking, integrated payment systems, and user-friendly reservation platforms enhancing the convenience and attractiveness of public transportation.

Affordability is addressed through PPP models by leveraging private sector investments and expertise. Governments can explore measures such as fare subsidies, discounted student passes, and flexible pricing structures tailored to student needs, making public transportation more accessible and cost-effective. PPP models also facilitate multi-modal integration, which is particularly advantageous for students requiring seamless transfers between different modes of transportation. Collaborative efforts between public and private entities result in a comprehensive and interconnected transportation network, offering students convenient and efficient travel options for their commuting needs.

2.4.1 E-ticket

E-ticketing (ET) offers several advantages over traditional paper tickets, as highlighted by the studies and sources mentioned. It facilitates a faster and more convenient ticket purchasing process, allowing customers to acquire tickets quickly and easily for various modes of transportation (M A Luhur et al., 2021). This can greatly benefit students who rely on public transportation by providing them with a streamlined and efficient way to obtain tickets.

One significant advantage of e-ticketing is the increased customer comfort and flexibility it offers. With e-tickets, customers have the convenience of accessing their tickets digitally, eliminating the need for physical documents (M A Luhur et al., 2021). This not only reduces the risk of tickets being lost, stolen, or damaged but also provides greater convenience as tickets can be accessed and managed from any device at any time (Thompson, 2023). This flexibility aligns well with the needs and preferences of students, who often rely on digital platforms and mobile devices for various aspects of their daily lives.

Moreover, e-ticketing can contribute to cost savings in ticket processing, benefiting both transportation providers and customers. The elimination of paper ticketing systems reduces printing and distribution costs (M A Luhur et al., 2021). This cost-effectiveness can potentially translate into more affordable ticket prices for students, making public transportation a more attractive and financially viable option.

Additionally, e-ticketing enhances security and reduces the risk of identity theft. As information is transferred electronically with encrypted data, the chances of fraudsters intercepting critical information are minimized (Thompson, 2023). This aspect of e-ticketing can instill confidence in students who might have concerns about the security of their personal information.

However, it is important to acknowledge the potential downside of e- ticketing, namely the risk of losing one's ticket. Unlike traditional paper tickets, which can be physically retained, e-tickets are digital and can be lost if not properly stored or accessed (Thompson, 2023). This emphasizes the importance of students taking precautions to safeguard their e-tickets, such as storing them securely in digital wallets or email accounts and creating backup copies if possible.

In conclusion, e-ticketing offers numerous benefits for students using public transportation, including convenience, flexibility, cost savings, and enhanced security.

It streamlines the ticketing process, aligns with students' digital lifestyles, and reduces the likelihood of ticket loss or theft. However, students should remain vigilant in protecting their e-tickets to avoid the inconvenience of losing their seat or ticket information.

2.5 Framework

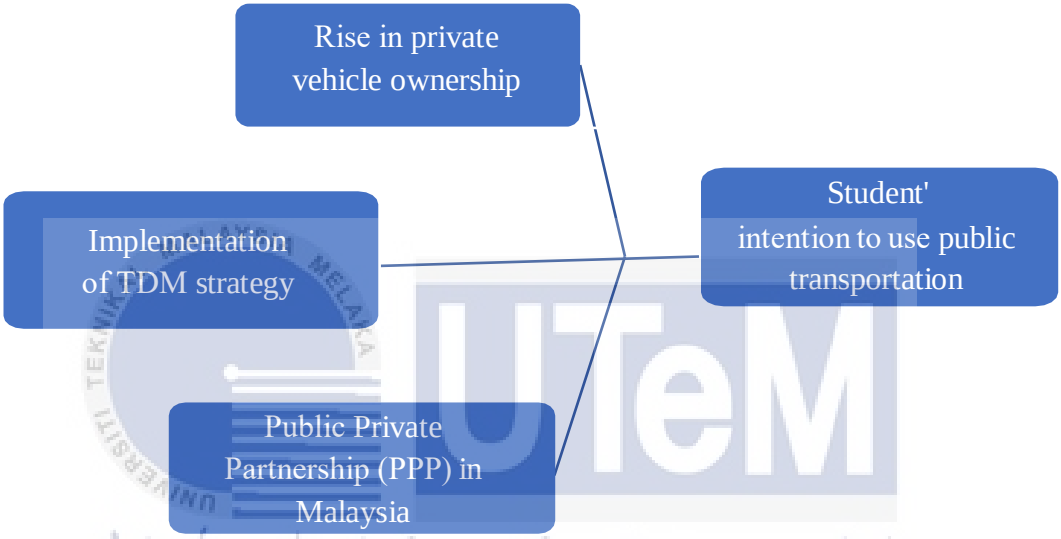

Figure 2.3: Hypothesis Chart

2.6 Hypothesis

2.6.1 Rise in the private vehicle ownership

H0: Rise in private vehicle ownership may present positive relationship with student' intention to use public transportation.

H1: Rise in private vehicle ownership may present negative relationship with student' intention to use public transportation.

2.6.2 Implementation of TDM strategy

H0: Implementation of TDM strategy may present negative relationship with student' intention to use public transportation.

H2: Implementation of TDM strategy may present a positive relationship with student' intention to use public transportation.

2.6.3 Public Private Partnership (PPP) in Malaysia

H0: Public Private Partnership (PPP) in Malaysia may present negative relationship with student' intention to use public transportation.

H3: Public Private Partnership (PPP) in Malaysia may present positive relationship with student' intention to use public transportation.

CHAPTER 3

Research Methodology

3.1 Chapter Overview

The best methodologies are needed for research to produce precise results. Therefore, research methodology needs to be carry out in the assignment. Methodologies are developed to rewrite the research and enable researchers to get the necessary data. The "how" of a research study is simply referred to as research methodology. More pacifically, it pertains to the methodical process by which a researcher designs a study to guarantee valid and trustworthy findings that address the goals, objectives, and research questions of the study. How the researcher made the following decisions, first is what type of data have been collected, either qualitative or quantitative. Second, who are the target audience for the research. How and what is the method to collect data is the third step and final the last step will be following with how to analyze the data gained. (Jansen. D, 2022)

Journal articles can be used into find a chapter or part on research methodology covering the topics in every official academic research project. A strong methodology chapter also provides justification for the methodological decisions taken, which is crucial. In other words, the methodology chapter should support the design decisions by demonstrating that the techniques and methodologies selected are the most appropriate ones for the study's goals, objectives, and central questions. (Jansen. D, 2022) This chapter will include the research design, survey instrument, data analysis and a summary.

3.2 Research Design

3.2.1 Type of study

Quantitative research is characterized by its emphasis on data, logical reasoning, and objectivity. It involves a systematic approach to studying phenomena by collecting measurable data and applying statistical, mathematical, or computational methods for analysis. This research approach is often used in social sciences and other fields to gather data from current and potential clients, using techniques like sampling, online questionnaires, polls, and surveys.

One of the key characteristics of quantitative research is the representation of outcomes in numerical form. This means that the data collected is transformed into numerical values, allowing researchers to quantify and analyze the results. Numerical data provides a solid foundation for making predictions and informed decisions based on statistical analyses. For example, by examining numerical data, researchers can forecast the future demand for a product or service and adjust accordingly. To derive quantitative data, researchers and statisticians employ mathematical theories and frameworks that are relevant to the specific quantities being studied. This ensures that the analysis is grounded in rigorous statistical principles. By using established statistical techniques, such as hypothesis testing, regression analysis, or data modelling, researchers can uncover patterns, relationships, and trends within the data.

Quantitative research also involves a structured approach to data collection. This often includes gathering data from larger samples that are representative of the entire population. By using appropriate sampling techniques, researchers aim to ensure that the collected data accurately reflects the characteristics of the population being studied. This allows for generalizations and inferences to be made about the broader population based on the findings from the sample. Overall, quantitative research provides a structured and systematic approach to analyze data and deriving meaningful insights. By employing statistical techniques and numerical analysis, researchers can draw objective and reliable conclusions from the data collected.

Causal research is the most appropriate form to use after determining the primary goal of the research, which to examinate the Rise in the private vehicle,

Implementation of TDM strategy ownership and Public Private Partnership (PPP) in Malaysia toward student' intention to use public transportation among FPTT student who enroll when 2020/2021 in UTeM. After the research problem has been defined, explanatory study or causal research, is must to conduct to determine the scope and type of cause-and-effect interactions. (Zikmund, W.G., Babin, J., Carr, J. & Griffin, M. (2012) This research investigates and examines the factors that affect the student' intention to use public transportation among FPTT student who enroll when 2020/2021 in UTeM.

3.2.2 Population

A group of elements with comparable features are referred to as a research population. Data is the primary gained from the local lecturer who works in UTeM, there are a total of 391 FPTT student who enroll when 2020/2021 in UTeM.

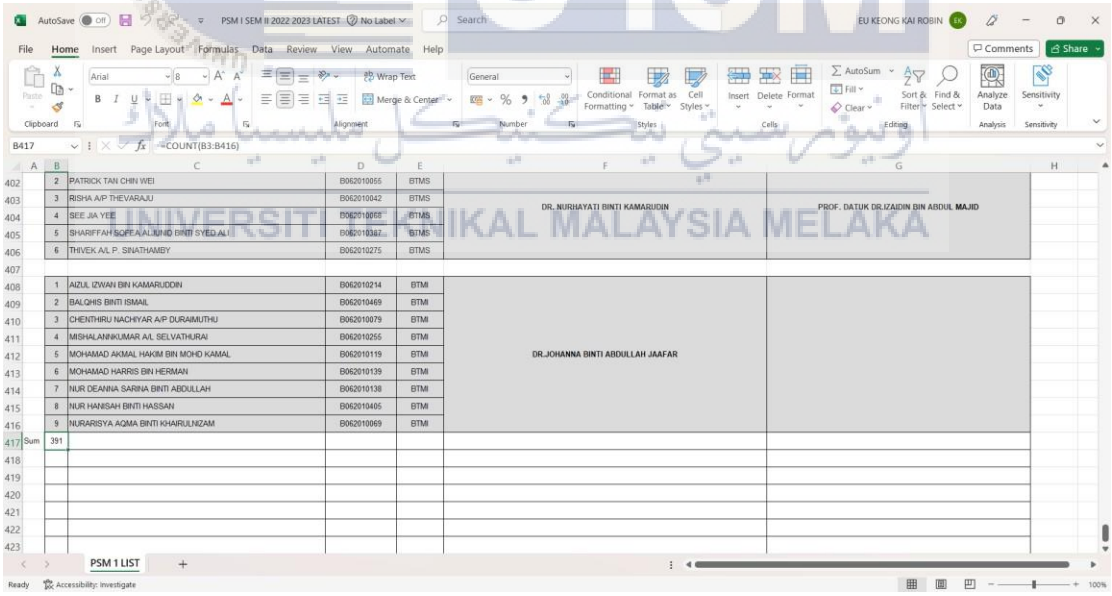

Figure 3.1: Total number of FPTT student who enroll when 2020/2021

This study's primary goal is to identify how TDM strategy and public transport management affect students' intentions to use public transport among FPTT Year 3 students in UTeM. Therefore, FPTT Year 3 students in UTeM will be the study's target population.

3.2.3 Sampling Frame

According to Sekaran (2003), a sample is a subset of the population, or a group of respondents selected from a larger population to be investigated for study. According to Taherdoost (2016), a sampling frame is a list of the components from which the sample will be taken from the intended population. Based on the study population (N) is 391 students in FPTT Year 3 student, therefore 196 university students (S) from FPTT Year 3 student in UTeM will be picked at random to answer the survey. (The Research Advisors, 2006)

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Figure 3.2: Kerjcie & Morgan Table

3.2.4 Sampling Method

Probability sampling and non-probability sampling are two types of sampling procedures. According to the definition of probability sampling, each member of the population has an equal chance of being included in the sample (Zikmund, 2003). However, when non-probability sampling is used, those persons in the population do not have a fixed chance of being included in the sample (Sekaran, 2003). Systematic sampling stratified random sampling, simple random sampling, and cluster sampling are a few forms of probability sampling approaches (Taherdoost, 2016). Non-probability sampling methods include judgement sampling, convenience sampling, snowball sampling, and quota sampling.

However, in this study, stratified random sampling will be used. stratified sampling is allowed to divide the target population into relevant and significant strata based on attributes related to the research, ensuring proportional representation of each stratum in the sample. This can help to improve the representativeness of the sample and provide more accurate results. (Acharya et al., 2013).

3.2.5 Data Collection Method

There are two data collection methods which are the primary data and secondary data (Cooper and Schindler, 2006). Only primary data will be utilized in this research.

The primary data refers to the information collected from meetings, one-to-one interviews, and survey questionnaires. Primary data are those data collected and gathered precisely for research at hand (Zikmund, 2003). The objective of primary data research is to have a better grasp of the research topic and to make a direct evaluation of it by acquiring first-hand information.

To examine the impact rise in the private vehicle, implementation of TDM strategy ownership and Public Private Partnership (PPP) in Malaysia toward student' intention to use public transportation among FPTT student who enroll when 2020/2021 in UTeM. Survey questionnaires will be used in this study. The questionnaires will be developed based on a review of studies that analyses similar theoretical constructs. For this research, 80 copies of questionnaires will be

distributed by mail.

The purpose of using questionnaires is to ensure the information gathered is consistent and precise. It is also the only practical method to achieve maximum response. It is conducted in an organized manner, where all respondents will provide their perspectives via questionnaires given to them, ensuring that no key aspects are overlooked. Less related research journals will be modified to construct the questionnaire for this research. Instead of using self-administered questionnaires, it is better to adopt questions from other researchers' questionnaires as it ensures the questions are highly valid to ask the respondents. The higher the validity, the more precise the measure can portray the concept.

3.3 Survey Instrument

For this study, the survey instrument is constructed with the reference of several related research journals.

3.3.1 Survey Questionnaire

Questionnaires are used for primary data collection since it is responsive, cheap, and efficient, according to Zikmund (2003). However, questionnaires are required to be carefully constructed, tested and error- free before it can be given to the respondents. Not only so, but questionnaires must also be designed in a simple layout so it can be easily understood and answer them with short time consumption. It is because the response rate is heavily dependent on the type of questions asked, the length of the questionnaire and the language used.

3.3.2 Measurement of Variable and Construct

A scale refers to how variables are described and grouped. The objective of scaling is to represent objects, persons, or events in the range, usually quantitatively (Zikmund, 2003). Nominal scale and Likert scale will be used in this study.

I. **Nominal scale**

Nominal scales, the simplest and weakest type of measurement, are regarded as the most understandable because they are only used to label or illogically categorise variables. Nomen, which means "name" in Latin, is where the word nominal first appeared. Nominal scales lack any quantitative value or order and are incapable of undergoing any mathematical operations. In essence, nominal scales are a form of coding and are based on characteristics of a certain kind, such as gender, ethnicity, and place of birth. Numbers, letters, colors, labels, and other symbols that distinguish between the categories are frequently employed in coding. Although integers can be arbitrarily allocated to nominal scales (e.g., 1 represents East, 2 represents North, 3 represents South, etc.), without order or equal intervals, it is impossible to conduct arithmetic operations (+, -, /, *) or logical operations (>,, =) on the data sets. In nominal scales, numbers are assigned, but this does not indicate ranking or order; rather, it merely gives the attribute a unique name. (Patricia E. Allanson1 , Charles E. Notar2, 2020). In this study, the first section of the questionnaire is designed with nominal scale. For instance, Question 1 (Gender), 2 (States), 3 (Private car ownership) and 4 (Class Duration) and 5 (Frequency to use Public Transportation).

II. **Likert Scale**

Likert scale is a measurement scale that allows respondents to express how strongly they agree or disagree with the statement ranging from very positive to very negative in nature (Zikmund, 2003). The questionnaire used Likert scale for each item to ensure uniformity in the data (Claveria, 2021)

In this study, a five-point Likert-type scale will be used in answering questions for section B and C. Numerical score in section B and section C will be assigned into (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree (Ninlawan et al., 2010).

3.4 Data Analysis

3.4.1 Data Analysis

The application of data analysis is used to understand clearly and interpret the collected data. Data analysis can test the righteousness of the data and hypotheses by using several data analysis methods (Sutton and Austin, 2015). Data obtained are being further evaluated to transform the data into meaningful information.

The Software Package for Social Science (SPSS) Version 27.0 for Student Version will therefore be used to statistically analyze the data obtained from the survey. To explore the link between the independent factors and dependent variables, SPSS will be used in inferential analysis, namely Multiple Regression Analysis and Pearson Correlation Analysis. It provided a platform to portray the data more effectively in graphical form using histograms, bars, and charts. Additionally, SPSS will be utilized to assess the research's hypotheses findings and establish the veracity of the hypotheses (Puteh and Azman Ong, 2017).

A variation on random sampling known as stratified random sampling divides the target population into two or more significant strata depending on one or more attributes. The sample frame is split up into several subsets. Then, from each of the

layers, a simple or systematic random sample is taken. As a result, basic random or systematic random sampling's benefits and drawbacks are often shared by stratified random sampling. The sample is more likely to be representative if the population is segmented into several pertinent strata since each stratum can be guaranteed to be represented fairly within the sample. But only if the researcher is aware of and can quickly identify relevant strata in the sample frame. The additional step in the sample process also increases the likelihood that it will take longer, cost more money, and require more effort to understand than simple random or systematic random sampling. According to De Vaus (2014), the sampling frame may occasionally already be stratified. If systematic random sampling is utilized, an alphabetical sampling frame of employee names will automatically guarantee that employees will be sampled in the proper proportion to the letter with which their name begins. Like this, if systematic random sampling is utilized, membership lists that are arranged by date of joining will naturally stratify by length of membership. However, stratification will be necessary if simple random sampling is used or if the sample frame contains periodic patterns.

3.4.2 Reliability & Validity

3.4.2.1 Reliability

In 1951, Lee Cronbach created the Cronbach's alpha (α), sometimes known as the coefficient alpha, as a dependability and internal consistency metric. It looks at the reliability of multiple- question surveys using the Likert scale (Aburbeian, Owda, & Owda, 2022). These surveys are designed to evaluate latent variables, which are hidden or unobservable traits like conscientiousness, neurosis, or openness that are challenging to measure directly in everyday life. The degree of resemblance between a group of test items is gauged by Cronbach's alpha. Nunnally (1978) suggested a minimum alpha of 0.7, whereas more recent recommendations generally call for a minimum alpha of 0.8 (Schrepp, 2020). It is critical to keep in mind that alpha is

significantly influenced by the scale's element count. A minimum coefficient of 0.65 to 0.80 is recommended by many methodologists, with higher values desirable. However, 0.65 is only acceptable when there are fewer than three items. These recommendations should be followed carefully, though. Although a high alpha score would suggest that the test items are closely related, alpha is also influenced by the number of items. According to Jabar, Ahmad Murad, and Abdul Khalid (2019) contend that more things can lead to a greater alpha whereas fewer things can lead to a lower alpha. High alpha values may signify queries that ask the same thing repeatedly. While a low alpha value could mean that there aren't enough questions on the test. Alpha can be enhanced by expanding the number of pertinent items.

Table 3.1: Cronbach' Alpha value

Cronbach's Alpha	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Very Good
$0.8 > \alpha \geq 0.7$	Good
$0.7 > \alpha \geq 0.6$	Moderate
$0.6 > \alpha$	Poor

3.4.2.2 Validity

Sürücü & Maslakçi (2020) stressed the words content validity and construct validity while talking about the measurement of psychological variables. The degree to which a measurement instrument's items accurately reflect the topic or idea under study is referred to as content validity. (Almanasreh et al., 2019). It ensures that the construct is fully covered by the test. Construct validity, on the other hand, examines how effectively the tool measures the item it is intended to assess. (Clark & Watson, 2019). It makes the tool stand out from similar ones and is consistent with the construct's theoretical underpinnings. For psychological tests to be trustworthy and accurate, both types of validity are necessary. While content validity ensures that the concept of interest is sufficiently addressed, construct validity ensures accurate measurement in accordance with theoretical assumptions.

3.4.2.3 Correlation

Correlation analysis is a crucial element for examining the relationships between variables and testing the hypotheses in this research. Two types of correlation analysis will be conducted: Descriptive Analysis, Pearson Correlation Analysis and Multiple Regression Analysis.

I. Descriptive Analysis

Descriptive analytics encompasses the use of present and past data to detect trends and relationships, constituting a fundamental type of data analysis that outlines patterns without delving into more profound insights. Readily available through basic statistical tools like Microsoft Excel or visualization platforms such as Google Charts and Tableau, it facilitates data parsing, trend identification, and visual representation. This method proves beneficial for communicating temporal changes and acts as a foundational step for more comprehensive analyses that inform decision-making processes within an organization. (Catherine Cote, 2021) A descriptive study is done to understand how different things are related.

II. Pearson Correlation Analysis

Pearson Correlation Analysis will be employed to assess the overall relationship between the dependent variable, which is students' intention to use public transportation, and the independent variables, including rise in private vehicle ownership, implementation of TDM strategy, and Public Private Partnership (PPP) in Malaysia. The correlation coefficient obtained from this analysis will indicate the strength and direction of the linear association between the variables. The coefficient ranges from -1.00 to +1.00, with 0 indicating no association and values between -1.00 to +1.00 representing possible associations (Aggarwal and Ranganathan, 2016). A higher coefficient indicates a stronger association.

III. Multiple Regression Analysis

Multiple Regression Analysis, on the other hand, will be employed to examine the relationships between the independent variables (rise in private vehicle ownership, implementation of TDM strategy, and PPP in Malaysia) and the dependent variable (students' intention to use public transportation). This analysis allows for the examination of multiple independent variables simultaneously and helps in hypothesis testing (Uyanik and Guler, 2013).

3.5 Pilot Test

A pilot study is conducted to determine the feasibility and suitability of a research investigation and to refine its design. It is conducted on a smaller scale compared to the main study but plays a crucial role in enhancing the effectiveness and quality of the overall research. The pilot study serves various purposes, including evaluating the randomization and blinding process, assessing recruitment potential, allowing researchers to gain experience with study methods or interventions, and providing estimates for sample size calculation. This paper focuses on addressing misconceptions and ethical implications associated with pilot studies and provides guidance on interpreting the findings (Junyong In, 2017).

In relation to the research topic at hand, a pilot test is necessary to evaluate the questionnaire and ensure logical and meaningful responses. For instance, if a researcher intends to survey landowners regarding their perspectives on land use restrictions, they may conduct interviews with a small sample, such as 10 people or 10% of the target population. The preliminary data collected from the pilot test can help researchers refine their interviewing scripts and make necessary adjustments before conducting the full-scale study.

3.6 Time Horizon

In futures studies, time horizons often relate to study intervals or a chronological horizon of different breadth. Three fundamental time horizons are distinguished by Kosow and Gaßner (2008): short-term, or up to 10 years; medium-term, or up to 25 years; and long-term, or more than 25 years. As an alternate time horizon, Kosow and Gaßner (2008) additionally identify static observations from a point in the future that is typically connected with normative tactics. Such a retrospective point is typically utilized to build "static" or "end-state" scenarios. (Jornal of Futures Studies, 2018)

In this research will be carried out with in cross-sectional mode of time horizon. Melnikovas (2018) state A cross-sectional study is carried out at one time or across a condensed amount of time. It offers a momentary glimpse of information gathered from a sample. Cross-sectional studies are helpful for analyzing the connections between variables at a specific point in time, but they do not reveal changes or patterns over time.

3.7 Research Location

This research will conduct in Faculty of Technology Management & Technopreneurship (FPTT) in University of Technology Malaysia Melaka (UTeM). UTeM in Malacca has a FPTT building in Campus technology at Hang Tuah Jaya, 76100 Melaka, Malaysia. The Faculty of Mechanical Engineering (FKM) building and the FPTT building are different structures located in the campus technology area. FPTT acts as a university that specializes in the teaching of technology and informatics. The dedicated FPTT building has classrooms, labs, computer labs, and specialized equipment pertinent to the technology and informatics fields. It offers a supportive setting for activities like teaching, learning, and research pertaining to different technological fields. (Website of FPTT)

Due to its direct link to the research topic and goals of this project, the choice of FPTT as the research location is significant. Being close to the research site makes the project more convenient and accessible for me as a student of FPTT. It is simpler to

collect data, communicate with participants, and navigate the campus when one is well acquainted with the FPTT building and its surrounds. This direct experience gained while a student improves the researcher's comprehension of the surroundings and may encourage a more intense interest in the research issue.

3.8 Gantt Chart

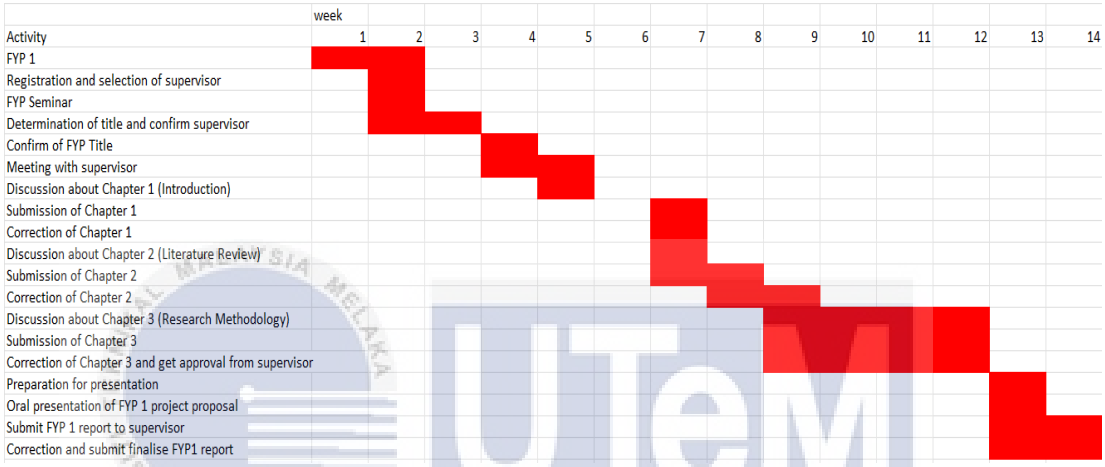

Figure 3.3: Gantt Chart Sem I

3.9 Summary

Conclusively, the data obtained from the distributed questionnaires will be summarized and the SPSS outputs will be interpreted. The analysis was separated into several sections including frequency analysis, validity test, reliability test and multiple regression analysis. The analyzed results will be brought forward to the following chapter for further discussion of the study.

CHAPTER 4

DATA ANALYSIS AND DISCUSSION

4.0 Chapter Overview

In this chapter, data obtained from 217 questionnaires will be analyzed to elaborate the results of the study by using SPSS version 27.0. It is divided into several subsections including respondents' demographic analysis, descriptive analysis, reliability analysis, Pearson Correlation Analysis and Multiple Regression Analysis. Then, the findings of the study will be summarized in the last section.

4.1 General Information of Data Collected

4.1.1 Data Entry – Codebook

Table 4.1: Codebook

Items	Code
Transportation Demand Management	TDM
Public-Private Partnership	PPP
Private Vehicle Ownership	PVO
Student' Intention	SI

4.2 Analysis of Pilot Test

4.2.1 Validity of Pilot Test

Table 4.2 Validity test of pilot test (N=30, Critical Value= 0.361)

Variable	Indicator/Item	Correlation Value	Critical Value (level of significance 0.05)	Validity
PVO1	[Using public transportation provides a convenient and cost-effective option compared to using a private vehicle for daily commuting.]	0.931	0.361	Valid
PVO2	[I find that public transportation is a reliable means of commuting that helps reduce traffic congestion and air pollution.]	0.575	0.361	Valid
PVO3	[The availability of public transportation services makes it easier for me to reach my destination in a timely and hassle-free manner.]	0.612	0.361	Valid
PVO4	[I believe that using public transportation promotes sustainability and has a positive impact on the environment.]	0.606	0.361	Valid
PVO5	[Compared to private vehicle ownership, I think using public transportation is a financially prudent choice for daily travel.]	0.760	0.361	Valid
Variable	**Indicator/Item**	**Correlation Value**	**Critical Value** (level of significance 0.05)	**Validity**
TDM1	[The implementation of Travel Demand Management (TDM)	0.600	0.361	Valid

	strategies has noticeably improved the efficiency and reliability of public transportation services in my area.]			
TDM2	[TDM initiatives, such as carpooling, have been instrumental in reducing traffic congestion and making daily commuting more efficient.]	0.470	0.361	Valid
TDM3	[TDM efforts have enhanced the accessibility of public transportation, making it easier for people to use sustainable travel options in my region.]	0.842	0.361	Valid
TDM4	[I believe that the implementation of TDM strategies contributes positively to a more environmentally friendly and sustainable transportation system.]	0.781	0.361	Valid
TDM5	[The presence of TDM initiatives has encouraged me to choose public transportation more frequently, considering its convenience and positive impact on the community.]	0.836	0.361	Valid
TDM6	[I find that the availability of TDM programs has made my daily commute more enjoyable and stress-free, promoting a healthier and more sustainable lifestyle.]	0.884	0.361	Valid
Variable	**Indicator/Item**	**Correlation Value**	**Critical Value** (level of significance 0.05)	**Validity**
PPP1	[Public Private Partnerships (PPP) have significantly enhanced the quality and accessibility of public transportation services in Malaysia, contributing to a more efficient and reliable	0.791	0.361	Valid

	transportation network.]			
PPP2	[The collaboration between the public sector and private companies has led to noticeable improvements in the overall standards and availability of public transportation in Malaysia, benefiting both commuters and the community.]	0.855	0.361	Valid
PPP3	[I perceive PPPs as key drivers of innovation in the public transportation sector, leading to the implementation of advanced technologies and improved services that cater to the needs of the public.]	0.828	0.361	Valid
PPP4	[The presence of PPPs has positively impacted my travel experience, providing me with a more seamless and convenient journey while using public transportation services in Malaysia.]	0.870	0.361	Valid
PPP5	[I believe that the collaborative efforts between the public and private sectors in Malaysia have resulted in a more sustainable and efficient transportation system that benefits both the environment and the community.]	0.918	0.361	Valid
Variable	**Indicator/Item**	**Correlation Value**	**Critical Value** (level of significance 0.05)	**Validity**
SI1	[I am inclined to use public transportation regularly for my daily commute, considering its convenience and reliability.]	0.818	0.361	Valid
SI2	[I believe that using public transportation contributes	0.746	0.361	Valid

	to a more sustainable and environmentally friendly way of commuting, which influences my decision to utilize it more frequently.]			
SI3	[The availability of efficient and well-connected public transportation options encourages me to choose this mode of travel over private vehicles for both short and long journeys.]	0.833	0.361	Valid
SI4	[I perceive using public transportation as a cost-effective option that aligns with my budget and promotes responsible spending on transportation.]	0.718	0.361	Valid
SI5	[The presence of reliable and safe public transportation services motivates me to prioritize this mode of travel, contributing to a sense of community and shared responsibility for sustainable mobility.]	0.761	0.361	Valid
SI6	[I believe that incorporating public transportation into my daily routine positively impacts my overall well-being, promoting a healthier and less stressful lifestyle.]	0.732	0.361	Valid

Source: Data developed by the researcher

According to Tables 4.2 all the questions in this study are valid. This condition occurs. This condition occurs when all values are greater than the assigned critical value. The critical values were determined based on the number of respondents in the pilot test. Respondents are represented as N as information, and N=30 is 0.361 which value from the table of Critical Value= R table.

4.2.2 Reliability of Pilot Test (CA>0.6)

Table 4.3 Reliability test of pilot test

Variable	Cronbach's Alpha	N of Item	Reliability
Private Vehicle Ownership	0.751	5	Reliable
Transportation Demand Management	0.840	6	Reliable
Private Public Partnership	0.905	5	Reliable
Student' Intention	0.853	6	Reliable

Source: Data developed by the researcher

Table 4.3 shows the SPSS result, the reliability was performed on 22 items from the survey questionnaire. The reliability that the questionnaire items was reliable because the Cronbach Alpha value was above 0.70, which the acceptable value of 0.60. As the result, the whole outcome was acceptable and reliable, and the data collection process can be continued.

4.3 Result Dissemination Questionnaire

Table 4.4 Result Dissemination Questionnaire

Evidence	Total
Distributed questionnaire	230
Receive questionnaire return	217
Response rate	93.91%
No returned questionnaire	13
Incomplete questionnaire	-
Total analyzed qualified questionnaire	217

Source: Data developed by the researcher

I administered the survey using an online method, anticipating the active participation of 230 individuals in the initial stage. Unfortunately, 13 respondents, for various reasons, did not complete the questionnaire, possibly engrossed in their own tasks and inadvertently leaving my request unfulfilled. Consequently, only 217 responses were successfully gathered, yielding a response rate of approximately 93.91 percent.

4.4 Result and Analysis

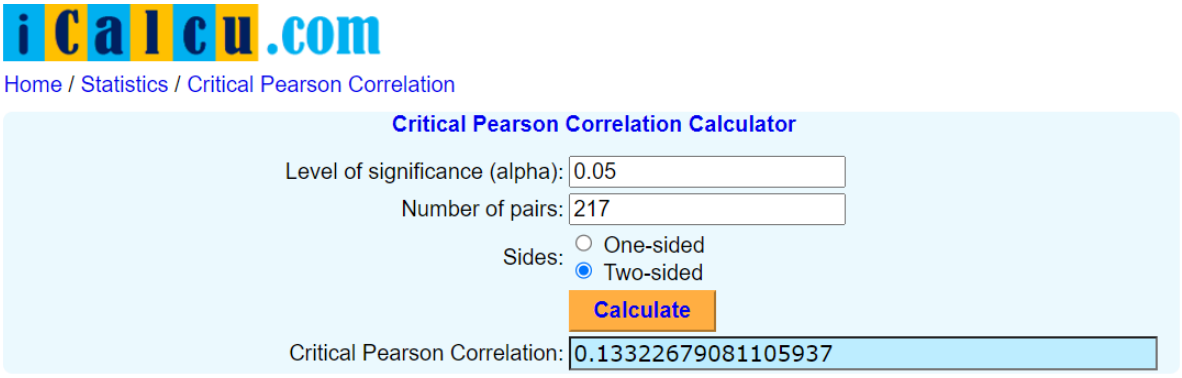

Figure 4.1 Critical Pearson Correlation Calculator

By using iCalcu.com, I knew that Critical Value of my test will be 0.133,when my number respondent is 217 and level of significance (alpha)=0.05.

4.4.1 Validity Analysis

Table 4.5: Validity of real test (N=217, Critical Value= 0.133)

Variable	Indicator/Item	Correlation Value	Critical Value (level of significance 0.05)	Validity
PVO1	[Using public transportation provides a convenient and cost-effective option compared to using a private vehicle for daily commuting.]	0.638	0.133	Valid
PVO2	[I find that public transportation is a reliable means of commuting that helps reduce traffic congestion and air pollution.]	0.686	0.133	Valid
PVO3	[The availability of public transportation services makes it easier for me to reach my destination in a timely and hassle-free manner.]	0.518	0.133	Valid
PVO4	[I believe that using public transportation promotes	0.682	0.133	Valid

	sustainability and has a positive impact on the environment.]			
PVO5	[Compared to private vehicle ownership, I think using public transportation is a financially prudent choice for daily travel.]	0.740	0.133	Valid
Variable	**Indicator/Item**	**Correlation Value**	**Critical Value** (level of significance 0.05)	**Validity**
TDM1	[The implementation of Travel Demand Management (TDM) strategies has noticeably improved the efficiency and reliability of public transportation services in my area.]	0.665	0.133	Valid
TDM2	[TDM initiatives, such as carpooling, have been instrumental in reducing traffic congestion and making daily commuting more efficient.]	0.663	0.133	Valid
TDM3	[TDM efforts have enhanced the accessibility of public transportation, making it easier for people to use sustainable travel options in my region.]	0.547	0.133	Valid
TDM4	[I believe that the implementation of TDM strategies contributes positively to a more environmentally friendly and sustainable transportation system.]	0.615	0.133	Valid
TDM5	[The presence of TDM initiatives has encouraged me to choose public transportation more frequently, considering its convenience and positive impact on the community.]	0.561	0.133	Valid
TDM6	[I find that the availability of TDM programs has made my daily commute more enjoyable and stress-	0.578	0.133	Valid

	free, promoting a healthier and more sustainable lifestyle.]			
Variable	**Indicator/Item**	**Correlation Value**	**Critical Value** (level of significance 0.05)	**Validity**
PPP1	[Public Private Partnerships (PPP) have significantly enhanced the quality and accessibility of public transportation services in Malaysia, contributing to a more efficient and reliable transportation network.]	0.643	0.133	Valid
PPP2	[The collaboration between the public sector and private companies has led to noticeable improvements in the overall standards and availability of public transportation in Malaysia, benefiting both commuters and the community.]	0.582	0.133	Valid
PPP3	[I perceive PPPs as key drivers of innovation in the public transportation sector, leading to the implementation of advanced technologies and improved services that cater to the needs of the public.]	0.721	0.133	Valid
PPP4	[The presence of PPPs has positively impacted my travel experience, providing me with a more seamless and convenient journey while using public transportation services in Malaysia.]	0.606	0.133	Valid
PPP5	[I believe that the collaborative efforts between the public and private sectors in Malaysia have resulted in a more sustainable and efficient transportation system that	0.583	0.133	Valid

	benefits both the environment and the community.]			
Variable	**Indicator/Item**	**Correlation Value**	**Critical Value** (level of significance 0.05)	**Validity**
SI1	[I am inclined to use public transportation regularly for my daily commute, considering its convenience and reliability.]	0.481	0.133	Valid
SI2	[I believe that using public transportation contributes to a more sustainable and environmentally friendly way of commuting, which influences my decision to utilize it more frequently.]	0.465	0.133	Valid
SI3	[The availability of efficient and well-connected public transportation options encourages me to choose this mode of travel over private vehicles for both short and long journeys.]	0.562	0.133	Valid
SI4	[I perceive using public transportation as a cost-effective option that aligns with my budget and promotes responsible spending on transportation.]	0.642	0.133	Valid
SI5	[The presence of reliable and safe public transportation services motivates me to prioritize this mode of travel, contributing to a sense of community and shared responsibility for sustainable mobility.]	0.698	0.133	Valid
SI6	[I believe that incorporating public transportation into my daily routine positively impacts my overall well-being, promoting a	0.666	0.133	Valid

	healthier and less stressful lifestyle.]			

Source: Data developed by the researcher

According to Tables 4.5 all the questions in this study are valid. This condition occurs. This condition occurs when all values are greater than the assigned critical value. The critical values were determined based on the number of respondents in the pilot test. Respondents are represented as N as information, and N=217 is 0.133 which value from the table of Critical Value= R table.

4.4.2 Reliability Analysis (CA>0.6)

Table 4.6: Reliability of Real Test

Variable	Cronbach's Alpha	N of Item	Reliability
Private Vehicle Ownership	0.659	5	Reliable
Transportation Demand Management	0.650	6	Reliable
Private Public Partnership	0.608	5	Reliable
Student' Intention	0.614	6	Reliable

Source: Data developed by the researcher

Table 4.6 shows the SPSS result, the reliability was performed on 22 items from the survey questionnaire. The reliability that the questionnaire items was reliable because the Cronbach Alpha value was above 0.70, which the acceptable value of 0.60. As a result, the whole outcome was acceptable and reliable, and the data collection process can be continued.

4.5 Respondents' Demographic Analysis

The survey questionnaire required each respondent to answer five questionsabout their demographic profile, including their gender, program that they take, transportation

type for to school and going back to hometown, year of enrolment and last question with do the respondents have used public transportation in the past year. This part analyses the demographic characteristics of respondents with frequency analysis. All data below was developed by the researcher.

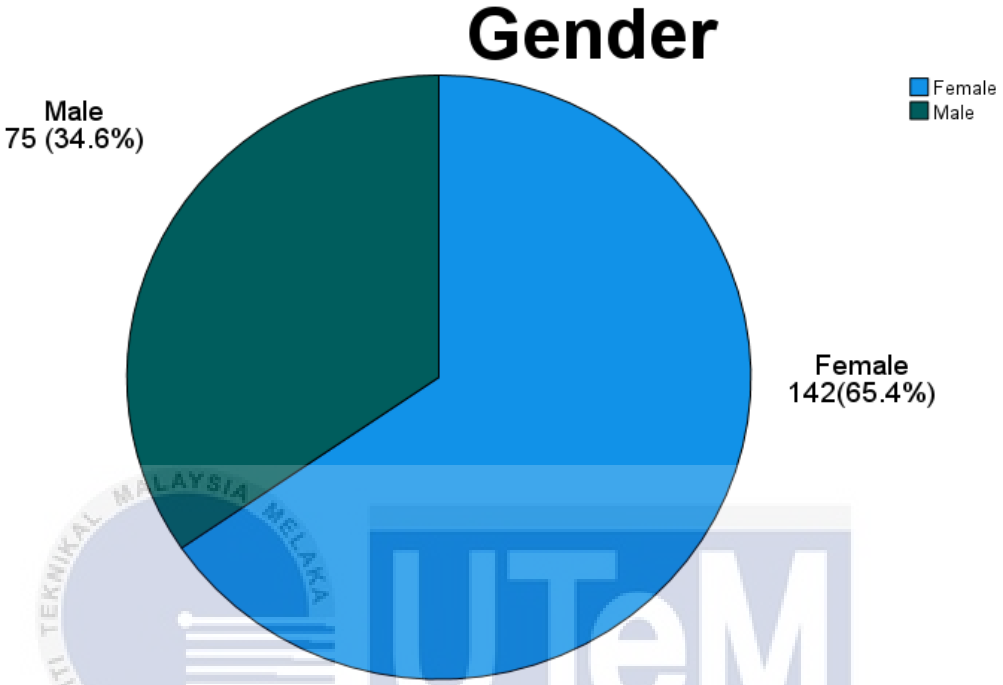

Figure 4.2: Respondents' Gender, N=217

Figure 4.2 outlines the respondents' demographic profile in detail. As each respondent represents their company, this finding implies that most of the respondents who participated in the survey have a higher number of females in the Faculty Pengurusan Technology. Hence, most respondents are females 142 people (65.4 percent), and the left is male 75 people (34.6 percent). Figure 4.3 shows that the four-program student been asked in the survey, the highest number of respondents is in the BTEC 60 people (27.6 percent) and follow up with BTMM and BTMI 57 people (26.3 percent) and BTMS' respondent are the least 43 people (19.8 percent).

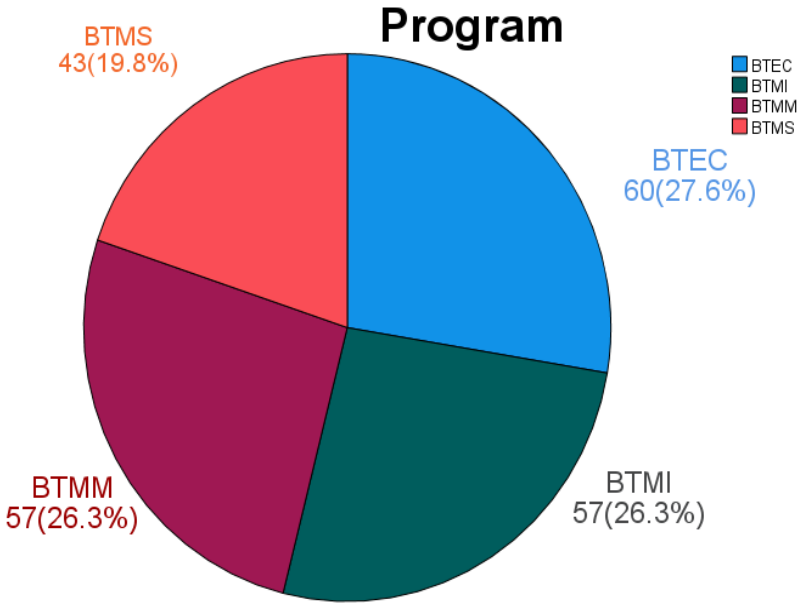

Figure 4.3: Respondents' Program that They Enrolled, N=217

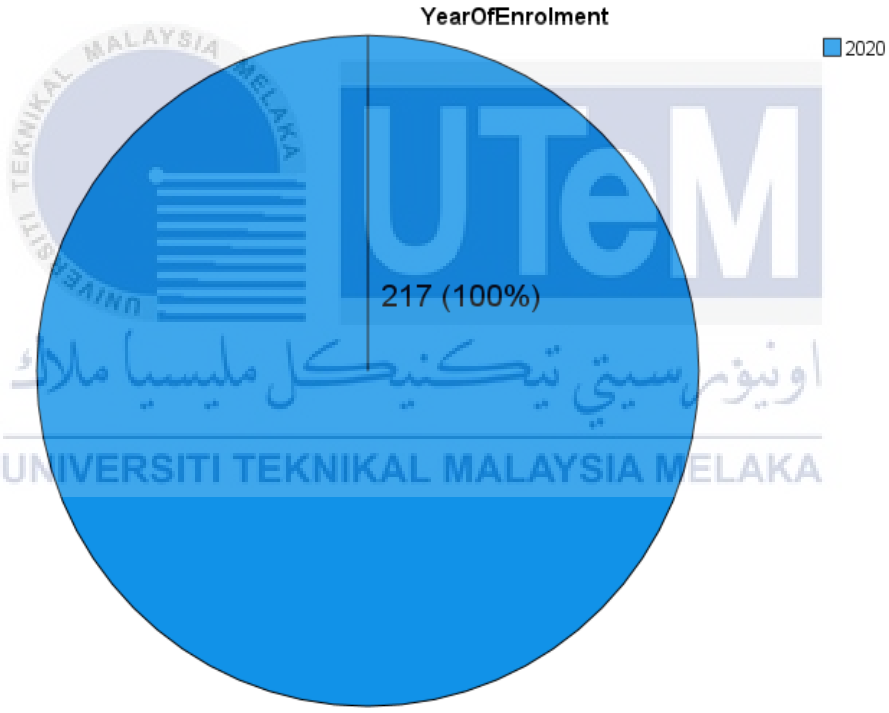

Figure 4.4: The Year of Enrolment of FPTT students, N=217

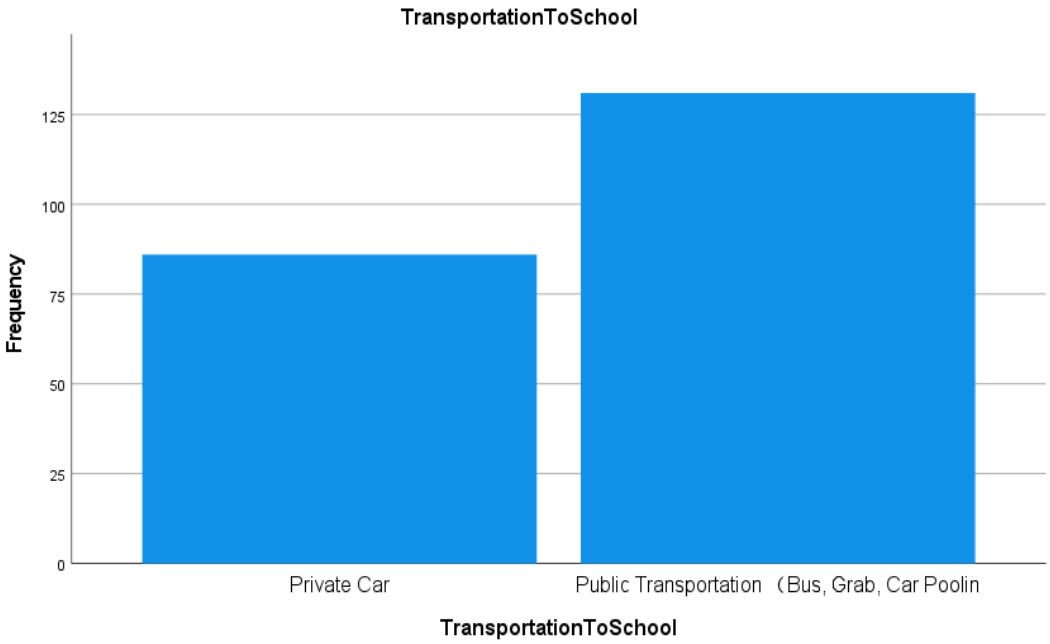

Figure 4.5: Type of Transportation that Student to School

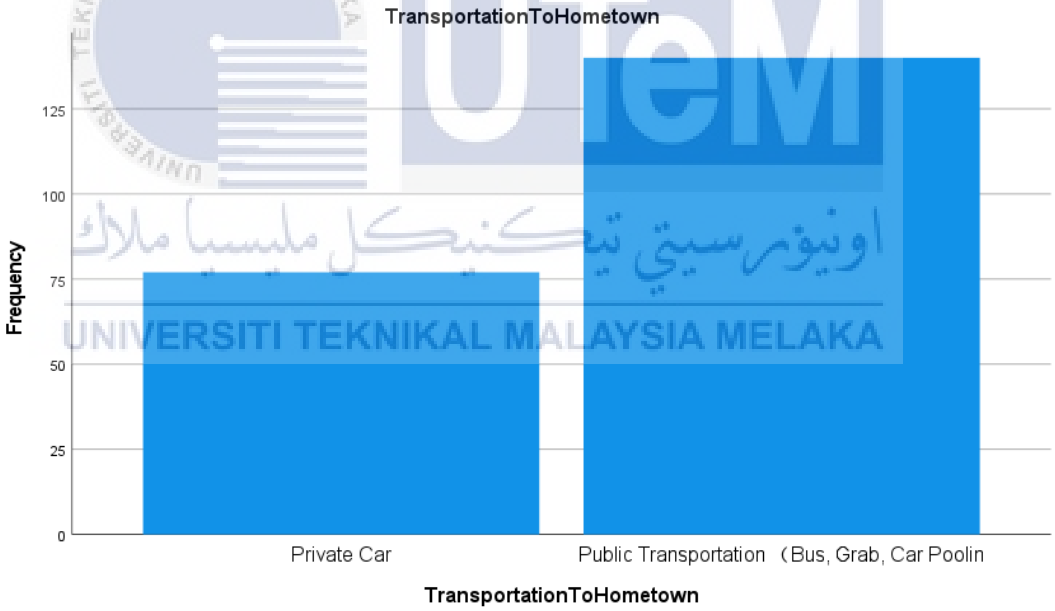

Figure 4.6: Type of Transportation that Student to Hometown

According to Figure 4.5 out of the respondents, 86 individuals (39.6 percent) prefer driving their private cars to school, while 131 respondents (60.4 percent) opt for public transportation options such as buses, Grab, and carpooling. Conversely, when returning to their hometowns, 77 respondents (35.5 percent) choose private cars, while 140 respondents (64.5 percent) rely on public transportation by data in Figure 4.6.

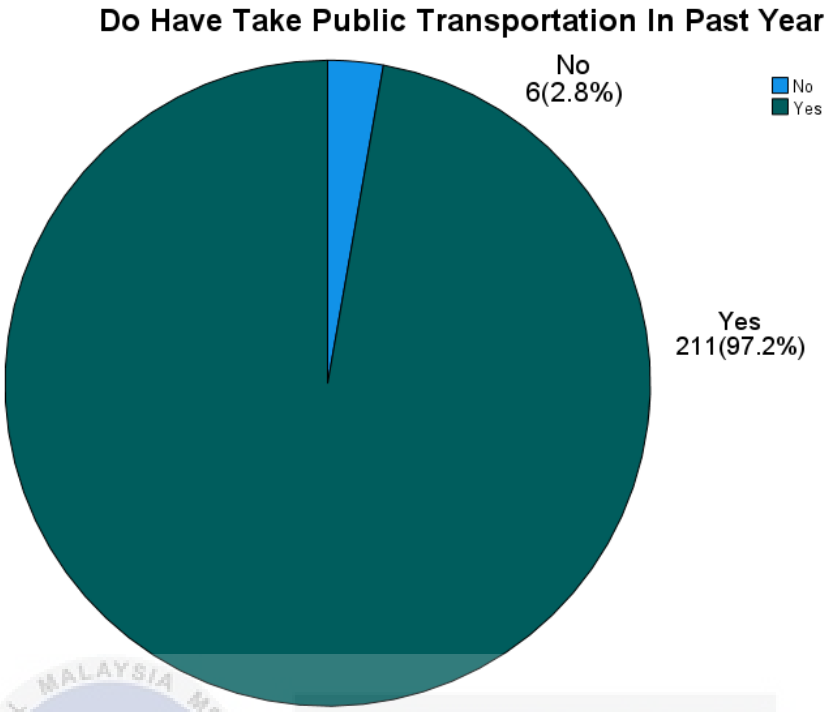

Figure 4.7: Do Student have Take Public Transportation in Past Year, N=217

Figure 4.7 shows 211(97.2 percent) of respondents taking public transportation in the past year 2022. Only 6 (2.8 percent) of respondents have not taken public transportation in the past year.

Table 4.7 Overall Demographic Information, N= 217

Demographic Variable	Categories	Frequency	Percentage (%)
Gender	Male	75	34.6
	Female	142	65.4
Program	BTEC	60	27.6
	BTMM	57	26.3
	BTMI	57	26.3
	BTMS	43	19.8
Transportation to School	Private Car	86	39.6
	Bus, Grab, Carpooling	131	60.4
Transportation to Hometown	Private Car	77	35.5
	Bus, Grab, Carpooling	140	64.5
Year of Enrolment	2020	217	100
Do You Have Take Public Transportation in Past Year	Yes	211	97.2
	No	6	2.8

Source: Data developed by the researcher

4.6 Descriptive Analysis (N=217)

Descriptive analysis involves examining and presenting data in a manner that provides a constructive depiction, summary, or illustration of data points. This method is pivotal in fulfilling all data conditions and is a crucial step in statistical data analysis. It offers insights into the data distribution, aids in identifying errors and outliers, and facilitates the recognition of patterns and similarities among variables. This preparatory phase equips researchers for subsequent statistical analyses. (Ayush Singh Rawat, 2021)

Rise in Private Vehicle Ownership' Descriptive Analysis (PVO)

Table 4.8 PVO' Descriptive Analysis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PVO1	217	1.00	5.00	4.7972	.49571
PVO2	217	3.00	5.00	4.6774	.47832
PVO3	217	1.00	5.00	4.5714	.57390
PVO4	217	2.00	5.00	4.5484	.56002
PVO5	217	1.00	5.00	4.6221	.65622
Valid N (listwise)	217				

Source: Data developed by the researcher

According to the table 4.8 shows PVO1 'Using public transportation provides a convenient and cost-effective option compared to using a private vehicle for daily commuting' is the highest mean for Rise in Private Vehicle Ownership which is 4.7972. While the highest standard deviation is for PVO 5 which is 0.65622 is because of all respondents are agree to PVO 5 'Compared to private vehicle ownership, I think using public transportation is a financially prudent choice for daily travel.'

Table 4.9: PVO' Descriptive Frequency Analysis

Variable / Item	1 (Strongly Disagree)		2 (Disagree)		3 (Neutral)		4(Agree)		5 (Strongly Agree)	
	Freq	%	F	%	F	%	F	%	F	%
PVO1	1	0.5	-	-	3	1.4	34	15.7	179	82.5

PVO2	-	-	-	-	1	0.5	68	31.3	148	68.2
PVO3	1	0.5	-	-	3	1.4	83	38.2	130	59.9
PVO4	-	-	1	0.5	4	1.8	87	40.1	125	57.6
PVO5	2	0.9	2	0.9	3	1.4	62	28.6	148	68.2

Source: Data developed by the researcher

Table 4.9 shows PVO1 has 1 respondent (0.5 percent) strongly disagreed, with no participants (0 percent) selecting the disagree. 3 respondents (1.4 percent) chose neutral, while 34 respondents (15.7 percent) expressed agreement. The majority, 179 respondents (82.5 percent), strongly agreed with PVO1. For PVO2, no respondents (0 percent) chose strongly disagree or disagree. 1 respondent (0.5 percent) selected neutral, while the majority, 148 respondents (68.2 percent), strongly agreed, and 68 respondents (31.3 percent) agreed with PVO2. Regarding PVO3, 1 respondent (0.5 percent) strongly disagreed, and no participants (0 percent) chose the disagree. 3 respondents (1.4 percent) remained neutral, while 83 respondents (38.2 percent) agreed, and the majority, 130 respondents (59.9 percent), strongly agreed.

For PVO4, 1 respondent (0.5 percent) disagreed, and an additional 4 respondents (1.8 percent) selected neutral. Agreement was expressed by 87 respondents (40.1 percent), and the majority, 125 respondents (57.6 percent), strongly agreed. In response to PVO5, 2 respondents (0.9 percent) strongly disagreed, 2 respondents (0.9 percent) disagreed, and 3 respondents (1.4 percent) remained neutral. Agreement was expressed by 62 respondents (28.6 percent), while the majority, 148 respondents (68.2 percent), strongly agreed.

Implementation of TDM Strategy' Descriptive Analysis (TDM)

Table 4.10: TDM' Descriptive Analysis

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
TDM 1	217	1.00	5.00	4.5069	.75228
TDM 2	217	1.00	5.00	4.6774	.55033
TDM 3	217	2.00	5.00	4.6221	.55700
TDM 4	217	2.00	5.00	4.6544	.54040
TDM 5	217	1.00	5.00	4.6175	.56623
TDM 6	217	1.00	5.00	4.7143	.52830
Valid N (listwise)	217				

Source: Data developed by the researcher

According to the table 4.10 shows TDM 6 'I find that the availability of TDM programs has made my daily commute more enjoyable and stress-free, promoting a healthier and more sustainable lifestyle' is the highest mean for Implementation of TDM Strategy which is 4.7143. While the highest standard deviation is for TDM 1 which is 0.75228 is because of all respondents are agree to TDM 1 'The implementation of Travel Demand Management (TDM) strategies has noticeably improved the efficiency and reliability of public transportation services in my area.' This indicated the student' intention to use public transportation is rising with the improvement of efficiency and reliability of public transportation services.

Table 4.11: TDM' Descriptive Frequency Analysis

Variable / Item	1 (Strongly Disagree)		2 (Disagree)		3 (Neutral)		4(Agree)		5 (Strongly Agree)	
	Freq	%	F	%	F	%	F	%	F	%
TDM 1	5	2.3	-	-	4	1.8	79	36.4	129	59.4
TDM 2	1	0.5	-	-	3	1.4	60	27.6	153	70.5
TDM 3	-	-	2	0.9	2	0.9	72	33.2	141	65
TDM 4	-	-	2	0.9	1	0.5	67	30.9	147	67.7
TDM 5	1	0.5	-	-	3	1.4	73	33.6	140	64.5
TDM 6	1	0.5	-	-	2	0.9	54	24.9	160	73.7

Source: Data developed by the researcher

For table 4.11, TDM 1has 5 respondents (2.3 percent) strongly disagree, while no participants (0 percent) selected the disagree. 4 respondents (1.8 percent) chose neutral, and a considerable 79 respondents (36.4 percent) expressed agreement. The majority, 129 respondents (59.4 percent), strongly agreed with TDM1. Moving on to TDM 2, a robust consensus is evident, with 1 respondent (0.5 percent) strongly disagreeing, and no participants (0 percent) selecting the disagree. 3 respondents (1.4 percent) chose neutral, while the majority, 153 respondents (70.5 percent), strongly agreed, and 60 respondents (27.6 percent) expressed agreement.

In the analysis of TDM 3, no respondents strongly disagreed, while 2 respondents (0.9 percent) chose the disagree. An additional 2 respondents (0.9 percent) remained neutral, and a noteworthy 72 respondents (33.2 percent) expressed agreement. The majority, 141 respondents (65 percent), strongly agreed with TDM 3.

For TDM 4, respondents generally leaned towards agreement, with 67 respondents (30.9 percent) expressing agreement and 147 respondents (67.7 percent) strongly agreeing. A minimal percentage disagreed, with 2 respondents (0.9 percent) selecting the disagree option, and 1 respondent (0.5 percent) remaining neutral.

In response to TDM 5, 1 respondent (0.5 percent) strongly disagreed, and no participants (0 percent) selected the disagree option. 3 respondents (1.4 percent) chose neutral, while 73 respondents (33.6 percent) expressed agreement. The majority, 140 respondents (64.5 percent), strongly agreed with TDM 5. Finally, in the analysis of TDM 6, 1 respondent (0.5 percent) strongly disagreed, and no participants (0 percent) selected the disagree. 2 respondents (0.9 percent) chose neutral, while 54 respondents (24.9 percent) expressed agreement. The majority, 160 respondents (73.7 percent), strongly agreed with TDM 6.

Public Private Partnership in Malaysia' Descriptive Analysis (PPP)

Table 4.12: PPP' Descriptive Analysis

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
PPP 1	217	2.00	5.00	4.6636	.51118
PPP 2	217	3.00	5.00	4.6866	.48444
PPP 3	217	2.00	5.00	4.6728	.50813
PPP 4	217	1.00	5.00	4.5991	.62405
PPP 5	217	2.00	5.00	4.7005	.48843
Valid N (listwise)	217				

Source: Data developed by the researcher

According to the table 4.12 shows PPP 5 'I believe that the collaborative efforts between the public and private sectors in Malaysia have resulted in a more sustainable and efficient transportation system that benefits both the environment and the community' is the highest mean for Public Private Partnership in Malaysia (PPP) which is 4.7005. While the highest standard deviation is for PPP 4 which is 0.62405 is because of most of the respondents are agree to PPP 4'The presence of PPPs has positively impacted my travel experience, providing me with a more seamless and

convenient journey while using public transportation services in Malaysia.' Due to the result of the survey shows that convenience of public transportation can directly affect the people' intention to use public transportation in journey.

Table 4.13 : PPP' Descriptive Frequency Analysis

Variable / Item	1 (Strongly Disagree)		2 (Disagree)		3 (Neutral)		4(Agree)		5 (Strongly Agree)	
	Freq	%	F	%	F	%	F	%	F	%
PPP 1	-	-	1	0.5	1	0.5	68	31.3	147	67.7
PPP 2	-	-	-	-	2	0.9	64	29.5	151	69.6
PPP 3	-	-	1	0.5	1	0.5	66	30.4	149	68.7
PPP 4	2	0.9	1	0.5	1	0.5	74	34.1	139	64.1
PPP 5	-	-	1	0.5	-	-	62	28.6	154	71

Source: Data developed by the researcher

Table 4.13 display PPP 1, no respondents (0 percent) strongly disagreed, while 1 participant (0.5 percent) expressed disagreement, and an additional 1 participant (0.5 percent) chose neutral. Agreement is notable, with 68 respondents (31.3 percent) expressing agreement and a significant majority of 147 respondents (67.7 percent) strongly agreeing. Moving on to PPP 2, no respondents (0 percent) strongly or moderately disagreed, with 2 participants (0.9 percent) selecting neutral. Agreement is substantial, with 64 respondents (29.5 percent) expressing agreement and a significant majority of 151 respondents (69.6 percent) strongly agreeing.

In the evaluation of PPP 3, no respondents (0 percent) strongly disagreed, while 1 participant (0.5 percent) expressed disagreement, and an additional 1 participant (0.5 percent) chose neutral. Agreement is prominent, with 66 respondents (30.4 percent) expressing agreement and a significant majority of 149 respondents (68.7 percent) strongly agreeing. For PPP 4, respondents generally leaned towards agreement, with 74 participants (34.1 percent) expressing agreement and a significant majority of 139 participants (64.1 percent) strongly agreeing. Dissent is minimal, with 2 participants (0.9 percent) strongly disagreeing, 1 participant (0.5 percent) expressing disagreement, and 1 participant (0.5 percent) choosing neutral. In response to PPP 5, no participants (0 percent) strongly disagreed or expressed neutral opinions. However, 1 participant (0.5 percent) disagreed, and 62 participants (28.6 percent) expressed agreement. The majority, 154 participants (71 percent), strongly agreed with PPP 5.

Student' Intention to Use Public Transportation' Descriptive Analysis

Table 4.14: SI' Descriptive Analysis

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
SI 1	217	1.00	5.00	4.7051	.61284
SI 2	217	1.00	5.00	4.7558	.49091
SI 3	217	1.00	5.00	4.6129	.67180
SI 4	217	1.00	5.00	4.6820	.54882
SI 5	217	1.00	5.00	4.6774	.65057
SI 6	217	1.00	5.00	4.7097	.53015
Valid N (listwise)	217				

Source: Data developed by the researcher

According to table 4.14, SI 2 'I believe that using public transportation contributes to a more sustainable and environmentally friendly way of commuting, which influences my decision to utilize it more frequently' has the highest mean which is 4.7558. Followed with SI 6 which is 4.7097 and SI 1 which is 4.7051. Meanwhile, SI 3 has the highest value of standard deviation which is 0.67180. This is because of most of the respondent agree to SI 3 'the availability of efficient and well-connected public transportation options encourages me to choose this mode of travel over private vehicles for both short and long journey.' affecting the people' intention to use the public transportation system.

Table 4.15: SI' Descriptive Frequency Analysis

Variable / Item	1 (Strongly Disagree)		2 (Disagree)		3 (Neutral)		4(Agree)		5 (Strongly Agree)	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
SI 1	3	1.4	-	-	-	-	52	24	162	74.7
SI 2	1	0.5	-	-	-	-	49	22.6	167	77
SI 3	3	1.4	1	0.5	2	0.9	65	30	146	67.3
SI 4	1	0.5	1	0.5	-	-	62	28.6	153	70.5
SI 5	3	1.4	1	0.5	1	0.5	53	24.4	159	73.3
SI 6	1	0.5	-	-	2	0.9	55	25.3	159	73.9

Source: Data developed by the researcher

Table 4.15 shows SI 1 has 3 participants (1.4 percent) strongly disagreed, while 52 participants (24 percent) expressed agreement, and a significant majority of 162 participants (74.7 percent) strongly agreed. No participants (0 percent) chose the

option of moderate disagreement or neutrality. For SI 2, 1 participant (0.5 percent) strongly disagreed, while 49 participants (22.6 percent) expressed agreement, and a significant majority of 167 participants (77 percent) strongly agreed. No participants (0 percent) chose the option of moderate disagreement or neutrality.

In the examination of SI 3, 3 participants (1.4 percent) strongly disagreed, 1 participant (0.5 percent) expressed moderate disagreement, and an additional 2 participants (0.9 percent) chose neutrality. Agreement is notable, with 65 participants (30 percent) expressing agreement, and a significant majority of 146 participants (67.3 percent) strongly agreed. For SI 4, 1 participant (0.5 percent) strongly disagreed, 1 participant (0.5 percent) expressed moderate disagreement, and no participants (0 percent) chose neutrality. Agreement is notable, with 62 participants (28.6 percent) expressing agreement, and a significant majority of 153 participants (70.5 percent) strongly agreed.

In response to SI 5, 3 participants (1.4 percent) strongly disagreed, 1 participant (0.5 percent) expressed moderate disagreement, and an additional 1 participant (0.5 percent) chose neutrality. Agreement is substantial, with 53 participants (24.4 percent) expressing agreement, and a significant majority of 159 participants (73.3 percent) strongly agreed. Finally, in the analysis of SI 6, 1 participant (0.5 percent) strongly disagreed, while 55 participants (25.3 percent) expressed agreement, and a significant majority of 159 participants (73.9 percent) strongly agreed. No participants (0 percent) chose the option of moderate disagreement or neutrality.

Table 4.16: Overall Independent Variable and Dependent Variable' Descriptive Analysis

Descriptive Statistics			
	Mean	Std. Deviation	N
Total PVO	23.2166	1.80895	217
Total TDM	27.7926	2.12532	217
Total PPP	23.3226	1.64066	217
Total SI	28.1429	2.05995	217

Source: Data developed by the researcher

The dataset encompasses the perspectives of 217 respondents, offering a diverse pool of insights. Within this dataset, the variables exhibit consistent minimum and maximum values, barring Total TDM, which demonstrates a broader range, spanning from 21 to 30. The means of Total PVO, Total TDM, Total PPP, and Total

SI are 23.22, 27.79, 23.32, and 28.14, respectively, indicating varying central tendencies across the measured parameters. Noteworthy is the prominence of Total TDM, characterized by both the highest mean and a larger standard deviation of 2.13, signifying not only elevated central tendency but also increased variability.

4.7 Correlation Analysis of All Variables

The Pearson correlation coefficient, denoted as 'r,' is a widely used statistical tool for measuring the linear relationship between two variables. With values ranging from 0 to 1, 'r' not only conveys the strength and direction of the connection but also functions as both a descriptive and inferential statistic. In its descriptive role, it concisely summarizes dataset characteristics, emphasizing the strength and direction of the linear link between two quantitative variables. Beyond that, as an inferential statistic, it enables hypothesis testing to determine if the observed relationship between variables is statistically significant, allowing for broader population inferences based on sample data. (Shaun Turney, 2023)

Table 4.17: Scale of Correlation Coefficients

Scale of Correlation Coefficient	Value
$0 < r \leq 0.19$	Very low correlation
$0.2 \leq r \leq 0.39$	Low correlation
$0.4 \leq r \leq 0.59$	Moderate correlation
$0.6 \leq r \leq 0.79$	High correlation
$0.8 \leq r \leq 1.0$	Very high correlation

Source: Maharana Pratap Singh, 2018

Table 4.18 Pearson's Coefficient Correlation

Correlations					
		Total PVO	Total TDM	Total PPP	Total SI
Total PVO	Pearson Correlation	1	.503**	.426**	.228**
	Sig. (2-tailed)		.000	.000	.001
	N	217	217	217	217
Total TDM	Pearson Correlation	.503**	1	.402**	.250**
	Sig. (2-tailed)	.000		.000	.000
	N	217	217	217	217
Total PPP	Pearson Correlation	.426**	.402**	1	.264**
	Sig. (2-tailed)	.000	.000		.000
	N	217	217	217	217
Total SI	Pearson Correlation	.228**	.250**	.264**	1
	Sig. (2-tailed)	.001	.000	.000	
	N	217	217	217	217
****. Correlation is significant at the 0.01 level (2-tailed).**					

Source: Data developed by the researcher

The analysis of correlation coefficients reveals diverse strengths and directions of associations among the variables. In the case of Total PVO, a moderate positive correlation of 0.503 with Total TDM suggests a notable tendency for both variables to increase concurrently. Furthermore, a weak positive correlation of 0.426 with Total PPP indicates a more modest but discernible relationship, while the correlation with Total SI is even weaker at 0.228, signifying a relatively subdued association compared to other variables.

Shifting the focus to Total TDM, it displays a strong positive correlation of 0.503 with Total PPP, suggesting a robust tendency for both variables to increase together. The correlation with Total PPP is moderately positive at 0.402, indicating a moderate strength in this relationship. The correlation with Total SI is weaker at 0.250, implying a less pronounced association compared to other variables.

Lastly, Total PPP maintains a moderate positive correlation of 0.264 with Total PPP, suggesting a discernible tendency for both variables to increase concurrently. In summary, these correlation coefficients provide valuable insights into potential interconnectedness among the variables. However, it's essential to approach these findings with caution, recognizing that correlation does not imply causation, and further contextual analysis is warranted to unravel the underlying dynamics.

In conclusion, the correlation coefficients offer valuable insights into the

relationships among the variables. The observed moderate to strong positive correlations indicate potential interconnectedness, suggesting that changes in one variable are associated with changes in another. However, it is crucial to emphasize that correlation does not imply causation. Further in-depth analyses, contextual considerations, and exploration of underlying factors are necessary to comprehend the intricate dynamics between Total PVO, Total TDM, Total PPP, and the other variables. These findings serve as a foundation for deeper investigation and highlight the importance of cautious interpretation in drawing meaningful conclusions from statistical associations.

4.8 Hypothesis Testing

Hypothesis testing is a crucial statistical analysis method that involves subjecting assumptions about a population parameter to empirical scrutiny, aiming to estimate the relationship between two statistical variables. This process utilizes random samples from a population to assess the plausibility of the null hypothesis, often positing an equality between population parameters, such as a claim that the population means return equals zero. Its counterpart, the alternative hypothesis, proposes the inverse, asserting, for instance, that the population means return is not equal to zero. These hypotheses are mutually exclusive, and only one can be correct, with the outcome revealing evidence in favor of either the null or alternative hypothesis. This methodology provides a systematic approach for researchers and analysts to test theories and make informed conclusions based on sample data. (Avijeet Biswal, 2023)

In the realm of statistical hypothesis testing, the comparison between the significance probability value and the predetermined significance level value is pivotal in determining whether to reject the null hypothesis, resulting in a conclusion of either "statistically significant" or "not statistically significant." This approach, often denoted by a significance level set at 0.05, involves assessing the p-value, where a p-value less than 0.05 is deemed "significant," while a p-value greater than 0.05 is considered "not significant." It's important to note that the choice of the significance level is at the discretion of the researcher and need not be fixed at 0.05. This flexibility

acknowledges that the determination of statistical significance depends on the specific circumstances and objectives of each study. (J Lipid Atheroscler, 2023)

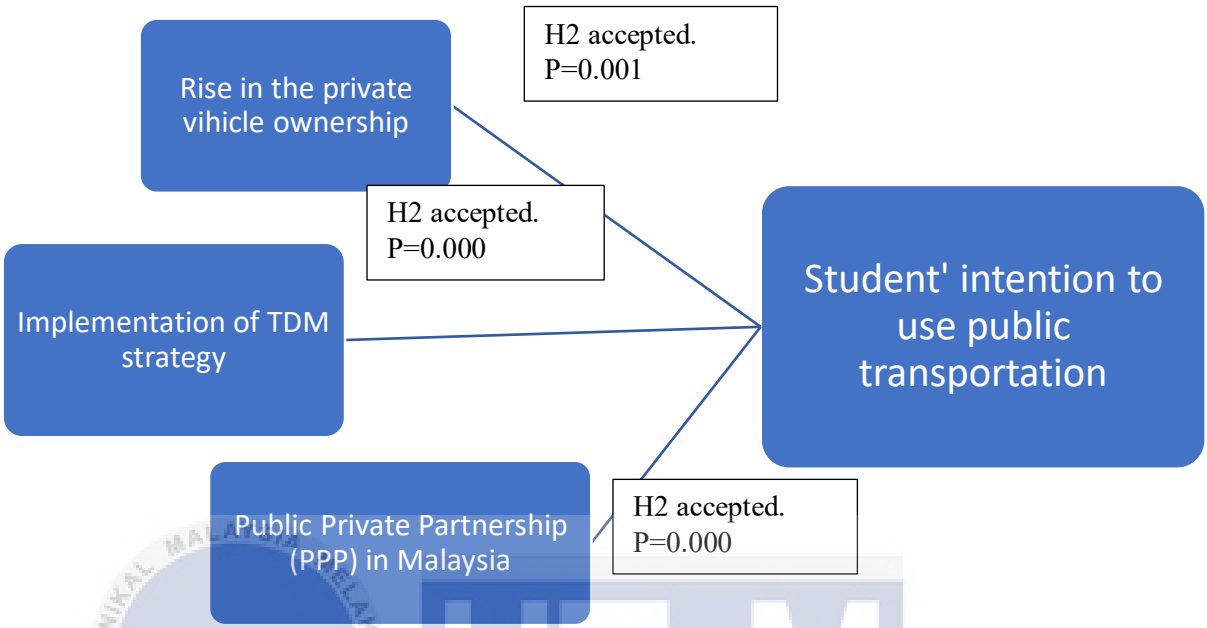

Figure 4.6: Hypothesis Testing Result

Table 4.19: Hypothesis Testing Rule

Sig., p-value < means significant indicating the rejection of H 0
Sig., p- value > means significant indicating the accept of H I

4.8.1 Hypothesis 1:

H0: Rise in private vehicle ownership may not present positive relationship with student' intention to use public transportation.

H1: Rise in private vehicle ownership may present positive relationship with student' intention to use public transportation.

Based on table 4.18, shows the data SPSS result that the significant value for Rise in Private Vehicle Ownership is 0.001, which is less than the significant level of P-value. As a result, H0 is rejected and H1 is accepted. It can show the positive relation of Rise in Private Vehicle Ownership between Student' Intention to use Public Transportation. This mean Rise in Private Vehicle Ownership had an impact on Student' Intention to use Public Transportation.

4.8.2 Hypothesis 2:

H0: Implementation of TDM strategy may not present positive relationship with student' intention to use public transportation.

H1: Implementation of TDM strategy may present a positive relationship with students' intention to use public transportation.

Based on table 4.18, shows the data SPSS result that the significant value for Implementation of TDM Strategy is 0.000, which is less than the significant level of P-value. As a result, H0 is rejected and H1 is accepted. It can show the positive relation of Implementation of TDM Strategy between Student' Intention to use Public Transportation. This mean Implementation of TDM Strategy had an impact on Student' Intention to use Public Transportation.

4.8.3 Hypothesis 3:

H0: Public Private Partnership (PPP) in Malaysia may not present positive relationship with student' intention to use public transportation.

H1: Public Private Partnership (PPP) in Malaysia may present positive relationship with student' intention to use public transportation.

Based on table 4.18, shows the data SPSS result that the significant value for Public Private Partnership (PPP) in Malaysia is 0.000, which is less than the significant level of P-value. As a result, H0 is rejected and H1 is accepted. It can show the positive relation of Public Private Partnership (PPP) in Malaysia between Student' Intention to use Public Transportation. This means Public Private Partnership (PPP) in Malaysia had an impact on Student' Intention to use Public Transportation.

Table 4.20: Hypothesis Table

Hypothesis	Item	Result
1	Rise in the private vehicle ownership may present positive relationship with student' intention to use public transportation.	Accepted P=value=0.001
2	Implementation of TDM strategy may present positive relationship with student' intention to use public transportation.	Accepted P-value=0.000
2	Public Private Partnership (PPP) in Malaysia may present positive relationship with student' intention to use public transportation.	Accepted P-value=0.00

4.9 Multiple Regression Analysis (MRA)

Table 4.21: Multiple Regression Analysis (MRA)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.315[a]	.099	.087	1.96850
a. Predictors: (Constant), TotalPPP, TotalTDM, TotalPOV				

According to the model summary in table 4.19, the value indicates that there is a significant relationship between the dependently modelled. The R square value is 0.315, indicating that 31.5% of the variables can be explained by independent variables combined. This indicates that 31.5% of the variables influenced the dependent relationship. Using the table Pearson Correlation Coefficient, the questions that are given are moderate questions which means the respondents understand the questions.

4.9.1 ANOVA

Table 4.22: ANOVA

ANOVA					
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	91.196	3	30.399	7.845	.000[b]
Residual	825.376	213	3.875		
Total	916.571	216			

a. Dependent Variable: Student's Intention to Use Public Transportation

b. Predictors: (Constant), Rise in Private Vehicle Ownership, Implementation of TDM Strategy' Descriptive Analysis (TDM), Public Private Partnership (PPP) in Malaysia

Source: Data developed by the researcher

The Analysis of Variance (ANOVA) table presents the outcomes of a regression model aimed at predicting students' intention to use public transportation, considering the variables PVO (Rise in Private Vehicle Ownership), TDM (Implementation of TDM Strategy' Descriptive Analysis), and PPP (Public Private Partnership in Malaysia). The noteworthy F-statistic of 7.845 ($p < 0.05$) in the regression component, characterized by a sum of squares of 91.196, underscores the collective impact of these predictors in meaningfully explaining the observed variability in students' intention to use public transportation. The residual component, marked by the sum of squares of 825.376, represents the unexplained variability. The relationship of IV and DV significant .000[b] (alpha <0.05)

As indicated in Table 4.22, the significance level for linear regression was less than $\alpha=0.05$ ($P<0.05$), indicating a 5% confidence level for results. The primary aim of significance testing is to explore the relationship between variables, considering the significant correlation between them. In this study, the calculated F-value is 7.845 and mean square of 30.399 demonstrate that PVO, TDM and PPP are significant factors influencing student' intention to use public transportation.

4.10 Regression Coefficient

Table 4.23 Regression Coefficient (P>0.05= not significant, P<0.05= significant)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.124	2.279		7.513	.000
	Total POV	.096	.089	.085	1.080	.281
	Total TDM	.134	.075	.138	1.780	.077
	Total PPP	.217	.093	.173	2.336	.020
a. Dependent Variable: Total SI						

Table 4.23 displays the table of the coefficient, which displays the p-value and contents for the significance of independent variable in predicting the dependent variable. According to findings Rise in Private Vehicle Ownership has a not significant effect on Student' Intention to use Public Transportation where (t=1.080, b=0.096, p= 0.281).

In addition, Table 4.23 shows Implementation of TDM strategy has a not significant positive effect on Student' Intention to use Public Transportation. with (t= 1.780, B=0.134, p=0.077). In addition, Public Private Partnership (PPP) in Malaysia only has a significant positive influenced Student' Intention to use Public Transportation which (t=2.336, B= 0.217, P=0.02). Thus, it can be concluded that a independent variables which is PPP only had a signification relationship with Student' Intention to use Public Transportation. However, Relation between dependent variable and all independent against PVO, TDM and PPP is positive.

4.11 Summary

In summary, in this chapter the researcher discusses each of the findings and analyse the collected data to determine the research study objectives. Researchers utilized a variety of data analysis technique to conduct this study which descriptive analysis, Pearson Correlation Coefficient, Multiple Regression analysis, and hypothesis testing. Extensive provided in chapter 5.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.0 Introduction

In Chapter 5, the researcher meticulously presents and discusses the findings obtained from hypothesis testing and data analysis in Chapter 4. The exploration into students' intentions to use public transportation among FPTT year 3 students who enrolled in the 2020/2021 academic year is thoroughly examined. The chapter not only encapsulates the results but also sheds light on the challenges faced during the research, providing a candid account of the study's intricacies. Recommendations for additional research are thoughtfully articulated, offering valuable insights into potential avenues for future exploration. This chapter serves as a comprehensive examination of the study question and objectives, tying together the empirical evidence and theoretical considerations to provide a nuanced understanding of the factors influencing students' transportation choices.

In summarizing the findings from Chapter 4, Chapter 5 culminates in drawing conclusive remarks and practical recommendations based on the study's objectives. The overarching goal of the study, to understand the factors influencing the intention to use public transportation among FPTT year 3 students, is addressed through a synthesis of the research outcomes. The chapter reiterates the significance of the study and its potential impact on shaping policies or interventions related to public transportation usage among the targeted student population. This structured conclusion not only encapsulates the essence of the research but also directs attention to avenues for future inquiry, fostering a continued dialogue within the academic community on this pertinent topic.

5.1 Summary of Findings

The summary of findings from the research, centered on FPTT students' intentions regarding transportation during the 2020/2021 academic year, unveils a multifaceted perspective. Within the population of 391 students meeting the specified criteria, a comprehensive survey drew responses from 217 individuals, illuminating the demographic fabric of the sample. Notably, there is a gender imbalance, with 65.4 percent of respondents identifying as female and the remaining 34.6 percent as male. Further exploration of program distribution, as depicted in Figure 4.3, delineates the numbers within each program. The BTEC program leads with a total of 60 students, closely followed by BTMM and BTMI, each accounting for 57 students, while BTMS is represented by 43 students.

Beyond demographic insights, the study delves into transportation preferences, uncovering intriguing patterns. A notable 39.6 percent of respondents, or 86 individuals, express a preference for driving their private cars to school, emphasizing the role of personal vehicles in daily commuting. Conversely, many 60.4 percent, or 131 respondents, opt for diverse public transportation options, including buses, Grab services, and carpooling, reflecting a range of choices embraced by the student cohort. When considering travel to hometowns, 35.5 percent, or 77 respondents, favor private cars, indicating a continued reliance on personal vehicles. In contrast, a significant 64.5 percent, or 140 respondents, choose public transportation for their journey home, underscoring a dynamic decision-making process influenced by factors such as convenience, cost, and environmental considerations.

This nuanced analysis not only provides a comprehensive overview of the demographic and program distribution within the surveyed population but also offers valuable insights into the intricate web of transportation preferences among FPTT students. The interplay of individual choices and collective trends adds depth to the understanding of commuting decisions, contributing to a richer narrative on transportation behavior within the academic cohort.

RO 1 : To determine the impact of the public transportation reservation system against the private car services.

RO 2 : To examine the factors influencing university students' intention to use public transport, specifically focusing on the implementation of TDM strategies.

RO 3 : To identify the impact of public private partnership (PPP) in Malaysia on student' intention to use public transportation.

5.2 Justification of Research Objective

5.2.1 Fulfillment of First RO 1

According to Exploring sustainable student travel behavior in The Netherlands: balancing online and on-campus learning by Marieke Versteijlen, Bert van Wee, Arjen Wals ,2021, stated the surge in private vehicle ownership among students on campuses is intricately linked to the prevailing transportation infrastructure and policies, notably influenced by factors such as high parking costs near the campus. However, contrary to assumptions, high parking costs can serve as a deterrent rather than an incentive for private vehicle ownership among students. Faced with exorbitant parking fees, students are prompted to explore alternative, more cost-effective modes of transportation, particularly favoring public transit options like buses. The financial burden associated with steep parking fees not only encourages a reconsideration of private vehicle ownership but also aligns with broader sustainability goals. This shift towards increased public transportation usage reflects a strategic response to financial disincentives while contributing to the reduction of carbon emissions and environmental impact.

In areas where parking costs pose a significant deterrent, students are likely to view the bus system as an attractive and affordable alternative. This transition, driven by both economic considerations and environmental consciousness, signifies a nuanced approach to fostering a more sustainable campus transportation ecosystem. Crucially, this shift towards public transportation holds the potential to not only mitigate financial disincentives associated with private vehicle ownership but also actively improve student intentions to use communal modes of travel. By strategically addressing the issue of high parking costs, institutions can play a crucial role in shaping a culture of responsible and eco-friendly transportation choices among the student

community, contributing to the broader sustainability objectives of universities and institutions.

5.2.1 Fulfillment of Second RO 2

According to article' Carsharing: a systematic literature review and research agenda by Brenda Nansubuga, Christian Kowalkowski. 2021 indicated the application of Transportation Demand Management (TDM) strategies, particularly the implementation of Carsharing, stands as a promising avenue in urban mobility planning. Carsharing has garnered attention due to its potential to provide the benefits of car ownership without the associated financial burdens. For the successful deployment of Carsharing within the TDM framework, several prerequisites have been identified. These include fostering collaboration and transparency among stakeholders, synchronizing demand, offering accessible and user-friendly solutions for a diverse customer base, exploring the integration of both personal and goods mobility, and ensuring public awareness of the availability of these mobility services.

Despite the growing interest in Carsharing, there exists a gap in service research concerning the identification of key customer requirements essential for an optimal car sharing experience. Addressing this gap becomes pivotal for refining and enhancing the efficiency of Carsharing programs, ensuring they meet the evolving needs of users. Consequently, future research endeavors should concentrate on delineating these key customer requirements, delving into aspects such as usability, accessibility, and the integration of diverse customer preferences into the Carsharing experience.

In the context of university campuses and students' transportation preferences, understanding and addressing these key customer requirements in Carsharing can play a crucial role in shaping an efficient and appealing transportation landscape. By bridging the identified gaps, universities can not only improve the overall student experience but also contribute to the broader goal of enhancing student intention to use public transportation. A seamlessly integrated and well-designed Carsharing system can serve as a complementary component of the overall transportation ecosystem, encouraging sustainable and convenient mobility choices among students.

Consequently, future research endeavors in this direction can significantly inform and influence the development and implementation of TDM strategies tailored to improve student intention to use public transportation.

Besides that, according to Exploring sustainable student travel behavior in The Netherlands: balancing online and on-campus learning by Marieke Versteijlen, Bert van Wee, Arjen Wals ,2021, stated increase the price of parking cost also can considered as one of the TDM strategies to control the number of private car ownership among to and then increase the student intention to use public transportation.

5.2.1 Fulfillment of Third RO 3

According to the article: “I like it, but I don't use it”: Impact of carsharing business models on usage intentions in the sharing economy" by Rüdiger Hahn, Felix Ostertag, Adrian Lehr, Marion Büttgen, Sabine Benoit, 2019, Aligned with the imperative for sustainable and environmentally friendly transportation modes, the integration of Public-Private Partnerships (PPPs) becomes a pivotal strategy for business executives and public administrations. The pressure to pursue green consumption practices has intensified, and this collaborative approach provides insights into fostering eco-friendly transportation initiatives. Particularly relevant are improvements in infrastructure facilities, such as charging stations for electric vehicles (EVs) and enhanced bus stop facilities. Within the sphere of sustainable urban mobility, it emphasizes the willingness of car-sharing users to forgo private car purchases, underscoring the potential for innovative PPPs. While the focus is not solely on EVs, incorporating electric charging infrastructure as part of PPP initiatives is a strategic move. Public administrators and private entities can collaborate to enhance charging infrastructure for electric cars, promoting the adoption of electric mobility within the community. This not only facilitates environmentally friendly transportation choices but also aligns with consumer preferences for sustainable options.

Expanding the scope beyond private vehicles, PPPs can address the infrastructure needs of public transportation, such as bus stop facilities. Collaborative efforts between municipalities and service providers can lead to the development of

efficient and user-friendly bus stops. This includes amenities like seating, shelters, real-time information displays, and other enhancements that contribute to a more comfortable and accessible public transit experience. In conclusion, leveraging Public-Private Partnerships for environmentally friendly transportation involves not only enhancing electric charging infrastructure but also improving overall public transportation facilities. Such collaborative initiatives can significantly contribute to sustainable urban mobility, meeting the growing demand for eco-friendly transportation choices and enhancing the overall quality of the transportation experience for the community.

5.3. Implication of Research

In the wake of an extensive survey research effort focused on understanding the transportation preferences of FPTT students enrolled during the 2020/2021 academic year, the researcher emerged with a nuanced understanding of the benefits associated with public transportation in contrast to private car usage. This exploration aimed to unravel the intricate fabric of students' commuting choices, providing valuable insights that extend beyond individual preferences to societal and environmental considerations.

The survey results illuminated a compelling dimension of public transportation — its capacity for cost savings. Delving into the preferences and behaviors of the surveyed population, the researcher discovered that public transit options offer a pragmatic and cost-effective alternative for students. By eliminating expenses tied to private car ownership, such as fuel, maintenance, insurance, and parking fees, public transportation emerges as a financial boon, providing substantial relief to individuals and families. This newfound economic freedom can significantly impact the financial well-being of students, fostering a more sustainable and equitable approach to urban mobility.

Beyond the realm of personal finance, the survey brought to the fore the profound environmental impact of choosing public transportation. The researcher discerned that public transit inherently aligns with sustainable practices, efficiently transporting a larger number of passengers with a reduced carbon footprint per person.

By curbing the number of individual vehicles on the road, public transportation emerges as a powerful ally in the global effort to mitigate climate change. The emphasis on environmental responsibility positions public transit as a cornerstone in fostering eco-friendly urban mobility practices among FPTT students.

Moreover, the survey uncovered a crucial societal benefit associated with public transportation — the reduction of traffic congestion. The findings indicated that encouraging more individuals to opt for shared modes of transport, such as buses and trains, can significantly alleviate congestion on roadways. This not only enhances the overall traffic flow in urban areas but also diminishes travel times for commuters. The resulting improvement in traffic conditions contributes to the creation of more livable and vibrant city environments, shaping a positive and efficient commuting experience.

In terms of safety, the survey revealed a notable statistic favoring public transportation. With trained professionals operating public transit systems, the incidence of accidents and fatalities is comparatively lower than in private car travel. The safety measures inherent in public transportation contribute to a sense of security for commuters, positioning it as a reliable and secure mode of transit.

In conclusion, the survey research has unveiled a comprehensive understanding of the benefits associated with public transportation for FPTT students. From the tangible cost savings to the positive environmental impact, the alleviation of traffic congestion, and the inherent safety measures, public transit emerges as a multifaceted and sustainable solution to the transportation needs of the surveyed population. The researcher's insights serve as a foundation for promoting informed decision-making regarding commuting choices, fostering a culture of responsible and efficient urban mobility within the academic community.

5.4 Limitation of Research

One significant limitation challenge being the heavy workload associated with requesting students to fill out forms individually. This process not only demands a considerable amount of time from the participants but also necessitates explanations to prevent any potential misunderstanding of the form's content. The intricate nature of the questions may require additional clarification, further contributing to the time-

consuming aspect of the data collection process.

Moreover, despite being part of the same academic program (FPTT), the lack of familiarity among students introduces another layer of complexity. Taking the time to get to know each participant individually becomes a necessary step to establish a connection and ensure accurate responses. This interpersonal aspect of the research process adds an extra dimension to the workload, potentially impacting the efficiency of data collection.

Additionally, the analysis of data and the interpretation of SPSS results pose another notable challenge. Understanding the intricacies of statistical outputs requires careful attention and comprehension, which may be time-consuming. Participants and researchers alike must invest time in reading and interpreting these results to derive meaningful insights from the data. This aspect of the research process may require additional resources and expertise to ensure accurate and reliable conclusions.

In summary, the limitations encompass the heavy task of individual form completion, the time-consuming nature of getting to know participants, and the complexity of analyzing SPSS results. Addressing these challenges would not only enhance the efficiency of the research process but also contribute to the overall quality and reliability of the study's outcomes.

5.5 Recommendation for Future Research

Beginning with qualitative insights, researchers should delve deeper into the motivations, perceptions, and experiences of FPTT students regarding public transportation. Incorporating interviews, focus groups, or surveys can provide a nuanced understanding of the factors influencing their choices, shedding light on the underlying reasons behind stated intentions to use public transportation.

The evaluation of accessibility factors constitutes another crucial avenue for future research. Assessing the convenience and accessibility of public transportation services, bus stops, and parking facilities is essential. This involves examining the proximity of bus stops to campus, the availability of parking spaces, and the overall ease of access to different transportation options. A thorough assessment can unveil critical barriers or facilitators influencing transportation choices among FPTT

students.

A cost-benefit analysis of various transportation modes emerges as a pertinent recommendation. Beyond financial considerations, this analysis should encompass time, convenience, and environmental impact associated with different commuting choices. Such an evaluation provides a comprehensive perspective on the factors influencing decision-making and aids in crafting targeted interventions.

Future research should also explore the effectiveness of behavior change strategies in encouraging FPTT students to opt for public transportation. Interventions such as incentives, informational campaigns, or personalized feedback could be tested to understand their impact on promoting sustainable commuting habits among students.

Lastly, investigating demographic variances in transportation preferences is crucial. Analyzing data based on factors such as gender, program of study, or year of enrollment can reveal specific patterns and help tailor interventions to address diverse needs. This targeted approach ensures that strategies for promoting public transportation usage resonate with the unique characteristics and preferences of different student groups.

5.6 Summary

After completing the data analysis outlined in Chapter 4, this chapter will discuss the findings. Therefore, we can conclude that the entire study was supported by necessary data analysis and literature evaluation to enable the researcher to contribute to the body of knowledge and be of practical significance. It is not unlikely that it would be beneficial to put recommendations for further research into action.

In summary, the PPP will have an impact on students' intention to use public transportation. Followed by TDM and rise in private vehicle ownership. PPP will directly affect the service quality of public transportation and make people more willing to use it. Enhancing the quality will be more efficient than TDM attaching some terms to something. When public transportation is more convenient than private cars, saves energy and saves money, I believe that after public transportation is improved, it can completely replace private cars and reduce the number of private cars.

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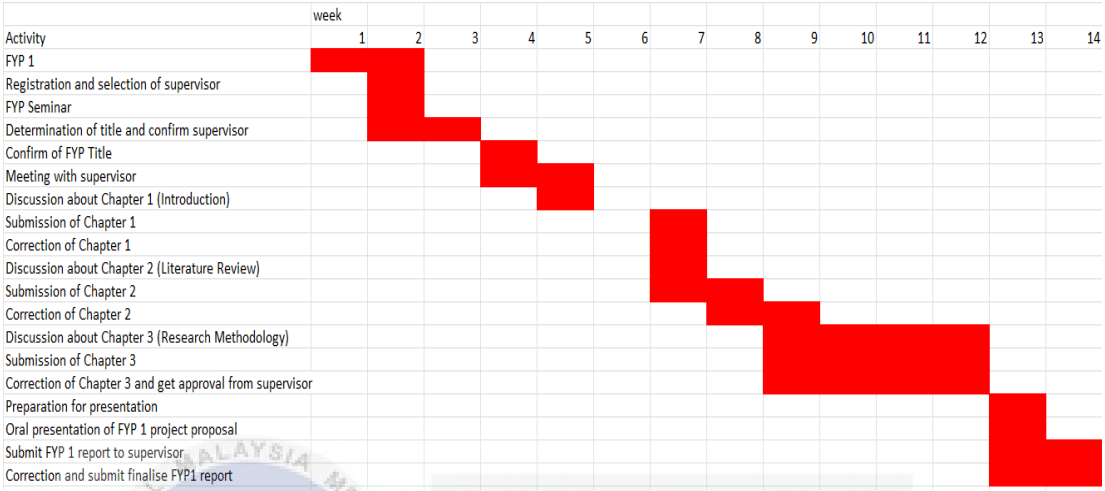
APPENDIX

GANTT CHART PSM I



GANTT CHART PSM II

	Week														
Acvitity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Constructing of questionnaire															
Revised for questionnaire															
Questionnaire Distribution															
Data Collection															
Data Analysis															
Chapter 4- Findings and Discussion															
Revised Chapter 4															
Journal Discussion															
Chapter 5- Conclusion															
Revised Chapter 5															
Final Edit FYP Report 2															
PSM Presentation 2															
PSM Report Submission 2 and Journal															

SURVEY- Questionnaire
PART 1

1 Gender

Male	
Female	

2 Program/Department:

BTMM	
BTMI	
BTEC	
BTMS	

3 Transportation type

	Public Transportation (Bus, Grab, Carpooling)	Private Car
To School		
Going Back to Hometown		

4 Year of Enrolment
2020

5 Have you used public transportation in the past year?

Yes	
no	

Part B
(1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree (Ninlawan et al., 2010).

Rise in Private Vehicle Ownership:

	1	2	3	4	5
1. Using public transportation provides a convenient and cost-effective option compared to using a private vehicle for daily commuting.					
2. I find that public transportation is reliable means of commuting that helps reduce traffic congestion and air pollution.					
3. The availability of public transportation services makes it easier for me to reach my destination in a timely and hassle-free manner.					
4. I believe that using public transportation promotes sustainability and has a positive impact on the environment.					
5. Compared to private vehicle ownership. I think using public transportation is a financially prudent choice for daily travel.					

Implementation of TDM Strategy:

TDM (Travel Demand Management) refers to a set of strategies aimed at reducing the use of single-occupancy vehicles for commuting, thereby promoting more sustainable transportation options. Examples of TDM strategies include carpooling, public transportation, biking, walking, and other initiatives designed to reduce traffic congestion and improve transportation efficiency. (Travel demand management policies: A case study of Singapore and transferability potentials for Hanoi, Trinh Dinh Toan a, Soi Hoi Lam b, Meng Meng c, Yiik Diew Wong d, 2023)

	1	2	3	4	5
1. The implementation of Travel Demand Management (TDM) strategies has noticeably improved the efficiency and reliability of public transportation services in my area.					
2. TMD initiative, such as carpooling and bike-sharing programs, have been instrumental in reducing traffic congestion and making daily commuting more efficient.					
3. TDM efforts have enhanced the accessibility of public transportation, making it easier for people to use sustainable travel options in my region.					
4. I believe that the implementation of TDM strategies contributes positively to a more environmentally friendly and sustainable transportation system.					
5. The presence of TDM initiatives has encouraged me to choose public transportation more frequently, considering its convenience and positive impact on the community.					
6. I find that the availability of TDM programs has made my daily commute more enjoyable and stress-free, promoting a healthier and more sustainable lifestyle.					

Public Private Partnership (PPP) in Malaysia:

A Public Private Partnership (PPP) is a collaborative arrangement between the public sector (usually government entities) and private companies to deliver public services or infrastructure projects. In the context of public transportation, it often involves private companies providing services or investments to enhance the public transportation system. EXP：Mass Rapid Transit (MRT) Projects

	1	2	3	4	5
1. Public Private Partnerships (PPP) have significantly enhanced the quality and accessibility of public transportation services in Malaysia, contributing to a more efficient and reliable transportation network.					
2. The collaboration between the public sector and private companies has led to noticeable improvements in the overall standards and availability of public transportation in Malaysia, benefitting both commuters and the community.					
3. I perceive PPPs as key drivers of innovation in the public transportation sector, leading to the implementation of advanced technologies and improved services that cater to the needs of the public.					
4. The presence of PPPs has positively impacted my travel experience, providing me with a more seamless and convenient journey while using public transportation services in Malaysia.					
5. I believe that the collaborative efforts between the public and private sectors in Malaysia have resulted in a more sustainable and efficient transportation system that benefits both the environment and the community.					

Part C

Student's Intention to Use Public Transportation (Extending the Technology Acceptance Model (TAM) to Predict University Students' Intentions to Use Metaverse Based Learning Platforms, Ahmad Samed Al-Adwan1 · Na Li2 · Amer Al-Adwan3 · Ghazanfar Ali Abbasi4 · Nour Awni Albelbisi5 · Akhmad Habibi6, 2023)

	1	2	3	4	5
1. I am inclined to use public transportation regularly for my daily commute, considering its convenience and reliability.					
2. I believe that using public transportation contributes to a more sustainable and environmentally friendly way of commuting, which influences my decision to utilize it more frequently.					
3. The availability of efficient and well-connected public transportation options encourages me to choose this mode of travel over private vehicles for both short and long journeys.					
4. I perceive using public transportation as a cost-effective option that aligns with my budget and promotes responsible spending on transportation.					
5. The presence of reliable and safe public transportation services motivates me to prioritize this mode of travel, contributing to a sense of community and shared responsibility for sustainable mobility.					
6. I believe that incorporating public transportation into my daily routine positively impacts my overall well-being, promoting a healthier and less stressful lifestyle.					

Source

Question	Author	References
POV 2	Hou L, Wang Y, Zheng Y, Zhang A.	The Impact of Vehicle Ownership on Carbon Emissions in the Transportation Sector. *Sustainability*. 2022; 14(19):12657. https://doi.org/10.3390/su141912657
TDM definition	Trinh Dinh Toan a, Soi Hoi Lam b, Meng Meng c, Yiik Diew Wong	https://www.sciencedirect.com/science/article/pii/S2213624X22002309
TDM 2	Ning Ma & Ziqiang Zeng & Yinhai Wang & Jiuping Xu	2021. "Balanced strategy based on environment and user benefit-oriented carpooling service mode for commuting trips," Transportation, Springer, vol. 48(3), pages 1241-1266, June.
SI	Al-Adwan, A.S., Li, N., Al-Adwan, A. *et al*	"Extending the Technology Acceptance Model (TAM) to Predict University Students' Intentions to Use Metaverse-Based Learning Platforms". *Educ Inf Technol* (2023). https://doi.org/10.1007/s10639-023-11816-3

Turnitin Result

Robin(Latest)

ORIGINALITY REPORT

20%	16%	7%	13%
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