Research Paper

Challenges of Commuting via Public Transportation: An Analysis of Students Traveling to National University-Manila from the South

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Abstract

Assessing the Effects of Relative Humidity to the Health, Comfortability and Cognitive Functions of Students: A Case Study at National University Manila National University- Manila, located in Sampaloc, Manila, experiences high humidity and tropical monsoon climate all throughout the year. Environmental indoor quality is crucial for health and comfort, and humidity affects the classroom's microclimate. This study investigates the effects of humidity on students at National University-Manila. The research examines how humidity impacts health, comfort, and academic performance in classrooms. A mixed-method approach was used in the study, integrating surveys, observations, literature reviews, and experiments. The relative humidity within the campus serves as the unit of analysis, while the students serve as the unit of observation. This study found that health problems like headaches and fatigue during high humidity periods are experienced by the students. The moderate humidity level of 40% to 60% is the proper perceived range for the cognitive and comfort of students. The level of humidity tends to be higher in the afternoon rather than mornings. High humidity hinders concentration and focus, despite perceived comfort in classrooms. Classrooms with air conditioning and windows have lower humidity levels than enclosed spaces like hallways. The beneficiaries of this study are students involved in the management of educational environments. By understanding how relative humidity affects a student's health or well-being and cognitive abilities. It can implement targeted strategies to optimize indoor air quality. Expected outcomes of this study include determining the optimal humidity level that contributes to student health, comfort, and academic performance, as well as providing our recommendations for improving air quality within the university.

Keywords

Commuting Experience, Public Transportation, Transport Demand Management, Traffic Congestions

1. Introduction

In today's modern world, commuting is now a normal day-to-day activity that most people engage in, especially in college life. College is a path that young adults take to prepare for adulthood and pursue their careers, making educational institutions an important role in shaping one's future. In this stage, young adults experience different challenges, from inconvenience to different stress levels, especially when commuting. Various factors that influence this multifaceted journey, including the physical proximity of the campus to the students. Students that commute longer were found to have higher stress levels which is 37.8% compared to those who have shorter commutes which is 24.1% (Jamil et al., 2022). Researchers have found that students view their commuting experience as a hindrance to their academic success. When students are satisfied with their commute, this positively affects their attendance, participation in activities, and perception of academic success, highlighting the significant impact of transportation on student's well-being (Taylor & Mitra, 2021).

Universities, especially in urban areas, contribute notably to urban mobility patterns, as more students are getting affiliated in these institutions. The transportation pattern to and from these universities can impact urban mobility. In recent years, Italy implemented Transport Demand Management (TDM) to alleviate these issues. Transport Demand Management (TDM) is a set of strategies aimed at maximizing traveler choices, including commuter ridesharing, air quality mitigation, development, and multi-modality in transportation plans, which provide travelers with effective choices to improve travel reliability, according to the US Department of Transportation Federal Highway Administration. . These policies aim to reduce car usage that is one of the cause of traffic and encourage people to start using a different mode of transportation such as biking and public transport. However these policies were limited whether this policies is effective especially in the context of commuting students.

A study conducted about the effectiveness and social efficiency of TDM policies found that while these policies are effective in reducing car use which help alleviate congestion and support the urban mobility plan where focuses on moving people and goods rather than vehicles (Kakujo, 2022)(www.ctc-n.org), only some of these are efficient. Researchers highlighted that thorough analysis in designing policies are needed to ensure that they are both effective and efficient in achieving the goals (Lucia & Romeo, 2015).

1.1. Commuting Patterns of Students

Commuting to school and from school is quite common in urban areas which is supported by a study conducted at Mapua Institute of Technology found 63.2% of students who live within campus and dormitories walk, and multimode travel accounts for 21.8% of the total, and it often takes multiple modes to return home, such as walk, bus, LRT, jeepney, or fx (Lim et al., 2017). Students who live near the campus shows different commuting modes to and from school, some students are driven to school but walk back home possibly due to parental convenience or scheduling constraints (Herrador-Colmenero et al., 2019). The pattern may differ, especially at the college level, where some students come from different cities. The choice of mode of transportation can be influenced by gender differences and seasonal factors. Non-motorized modes of transportation are favored in warmer months; this shows disparities between preferences of male and female, with male generally more likely to bike than females (Delmelle & Delmelle, 2012). This was also supported by a study conducted at the University of Leon (ULE), where men use bicycles and motorcycles frequently and women tend to take other modes of transportation (Hidalgo-González et al., 2022). Another study suggests that students who live alone are likely to commute by driving alone, while students who have classmates who live nearby and have friends increase the likelihood of taking public transportation (Zhou, 2012). Study conducted in Sylhet, Bangladesh found that active commuting is common but most use passive modes, factors such as distance, preferred mode of commuting, socioeconomic status, weather conditions, distance, authority, time effects, road safety, residence, and internet use influence students' choices (Urmi et al., 2022) (Müller et al., 2008). Therefore,

understanding the complexities of student transportation to and from campus uncover a multifaceted landscape of challenges.

1.2. Challenges of Commuting

Commuting as a student can be a challenge from time management to academic impact. The most common problem that most commuters experience is traffic and long queues that affect both private and public transport. These factors are just one of the few that students face as they travel to school. Students reported a negative impact on their participation on campus activities and academic success where they perceive commuting as a barrier to campus activity (Taylor & Mitra, 2021). This claim is also supported by a study conducted in Davao City, where the correlation between traffic congestion and class attendance motivation has a significant relationship. As students negatively experience traffic as they travel, they feel stress, frustration, and anxiety that impact their motivation to attend class (Rellon et al., 2024). This suggests that traveling a long distance consumes a lot of their time that reduces their availability to study and rest. Research found that longer commutes negatively impact Subject Well-being (SWB) and mental health, while active travel modes such as walking and cycling reduce depressive symptoms and improve their life satisfaction (Liu et al., 2022). Study also shows that Active Commuting (AC) to and from university could be beneficial for the students health since young adulthood is a period where obesity and metabolic syndrome (MetS) is critical, researchers found that male students who walked to campus are less likely to be obese, have lower HDL cholesterol (HDL-C) and high blood pressure compared to passive commuters (García-Hermoso et al., 2018) but in recent study found that there are no correlation between weight gain and commute duration where their findings the highest percentage of weight gain is 34.9% occurring between 5 and 30 minutes (Jamil et al., 2022).

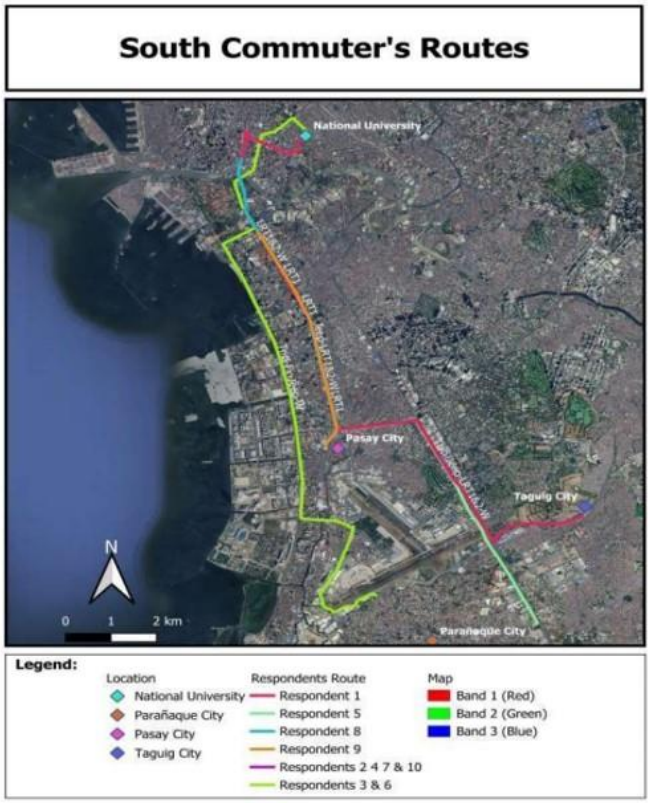
The objective of this study is to evaluate the challenges faced by students at National University-Manila who commute from the southern region of Metro Manila to the campus. This study also aims to identify and analyze how their commuting experiences affect their participation in campus activities and their overall well-being. Additionally, this research investigates the factors that influence the commuting patterns among students from the southern part of Manila, explores the role of gender in shaping to their commuting experiences. Furthermore, the commuting modes chosen by the students will be analyzed for the impact of active commuting in improving physical health. Lastly, the convenience of use and accessibility of the many forms of transportation these students use will be assessed as well as the methods of time management they utilize to get through long travels.

- What are the biggest challenges that students traveling to the National University of Manila from the southern parts of Metro Manila has to face?
- What are the key factors influencing the choice of transportation mode among students commuting from the south?
- How effective are existing transportation policies and infrastructure in supporting the commuting needs of students traveling from the southern regions?

2. Methodology

The assessment of the experience of commuters to the national university of Manila among college students from the South. The selected respondents serve as the unit observation of this study, their perceptions and personal experiences will be the main data gathered for this research. Data collection focuses more on how individuals experience or challenges when going to university, this approach allows for a deeper understanding of the challenges faced by college students who have commute. The independent variable is the commuting experience of college student from south to the National University, and its dependent variables are the different distances to the university. Moderating variables transportation options, weather conditions, and socioeconomic status which can affect the relationship of

the dependent and independent variables. The variables are the data from QGIS software mapping from a processing toolbox called network analysis.



2.1. Spatial Data and Tools using QGIS

Location of student, university, and transportation networks; and network analysis tool to assess the efficiency of various travel routes. This data has significance for organizing and improving the transportation system, to locate possible delays in traffic, places where access to transit is limited, and chances to enhance communication between college campuses and residences for students.

2.2. Structured Interview

To study the challenges faced by students traveling by public transportation to National University-Manila from the South, The study will target students living in the southern region such as Parañaque, Makati, Pasay, etc. Using stratified random sampling, the population is divided into strata based on their place of residence.

2.3. Thematic Analysis and Comparative Analysis

This will be used to gather data of students, travel routes that have experienced traffic,times, and which will provide information about the commuting behavior of college students from the south. This information can be crucial for optimizing transportation mobility, enhancing safety measures, and promoting sustainable commuting practices among students.

After getting the data from the respondents, we will use it in the Mapping Software QGIS which will mark the route according to the respondent what is their experience or challenge when they commute. The result of this is that we will use what issue we want to solve. In the process we will do is the structured sampling, our focus is to find college students who live in the South (Pasay, Parañaque, and in Taguig) and for the additional respondent we will look for a young adult, middle age and old adult with a total of 10 all

respondents. We conducted the interview face to face and the question contents were 25 questions and it lasted 10-15 mins. The questions include commuting experience, challenges faced, factors influencing transportation choice, gender difference, active commuting and physical health, time management strategies, policies and infrastructure, insight and recommendation from the respondent, in this process we will use thematic analysis, We will collect responses from college students and participants about their common challenges in commuting and their recommendations on all themes. Next, we used a comparative analysis, this is the content of the respondent, what is their experience in commuting, routes that have experienced traffic. All the results of this help to solve through our recommendation to avoid the challenges in commuting of students and commuters in Manila.

3. Results and Discussion

Table 1 presents the data collected from the interviews with 7 students of the National University-Manila and 3 participants, from a senior high school student to a working adult up to the elderly. The analysis of the respondents feedback shows several similar insights regarding the challenges, factors that influence choice of transportation, and effectiveness of TDM policies for students that commute from the southern part of Metro Manila to NU-Manila.

Table 1: Demographics and Commuting Experience of Respondents

Attribute	Respondent 1	Respondent 2	Respondent 3	Respondent 4	Respondent 5	Respondent 6	Respondent 7	Respondent 8	Respondent 9	Respondent 10
Age	18	20	17	20	20	20	20	74	17	41
Gender	Female	Male	Female	Male	Female	Male	Male	Male	Male	Female
Place of Origin	Taguig City	Pasay City	Parañaque City	Pasay City	Parañaque City	Parañaque City	Pasay City	Pasay City	Pasay City	Pasay City
Duration of Commute	2 hrs	1 hr	1-2 hrs	25-30 mins	1-2 hrs	1-2 hrs	40 mins - 1hr	30 mins	20 mins-1hr	1hr
Mode of Transportation	Tricycle-Jeepney-LRT1&2-walk	LRT1&2-Walk sometimes	Tricycle-Fx-Jeepney-Walk	LRT1&2-Walk	Jeepney-LRT1&2	Trici-Fx-jeepney-walk or Trici-	LRT1&2-Walk	LRT1	LRT1	LRT1&2

		Jeepneys				jeep-LRT1-2-walk				
Traffic Experience	Magallanes Rd & EDSA	Mendiola Intersection	Roxas Blvd Quezon Blvd España Blvd	No particular issues	EDSA & Paranaque West Service Rd	Roxas Blvd Quezon Blvd Espanya Blvd	No particular issues	No particular issues	No particular issues	No specific Road
Time Management	2 hrs before	1 hr and 30 mins before	1-2 hrs before	30 mins-1hr before	2 hrs before	1-2 hrs before	2 hrs before	None	Leave early	Leave early
Factors Influencing Choice	Cost less	Cost less and convenience	Fast and convenience	Fastest mode of transportation	Cost less, convenience, faster	Cost less and convenience	Fast and Cost less	Cost less, fast and convenience	Cost less, fast, safe and convenience	Fast and convenience
Active or Passive Commuting	Walking - to save money	Walking-Faster	Passive Commuting	Passive commuting	Walking-exercise	Active commuting	Passive commuting	Passive commuting	Active commuting	Passive commuting
Common Challenges	Traffic, Crowd Crush, and Theft	Delay, overcrowding	Mostly traffic overcrowding	Technical issues with trains	Traffic overcrowding	Traffic delays, crowd crush, safety concerns	Long lines in buying tickets /loading cards	Long lines in buying tickets and overcrowding	Overcrowding	Traffic
Impact on	Yes, impacts	Yes, no time	Yes, takes up too	Yes, delays arrival	No impact	Yes, takes up too	Yes, takes up too	No impact	No impact	No impact

Travel Time	travel experience	for review	much time		reported	much time	much time	reported	reported	reported
Effects on Daily Routine	Yes, overthinks bad experiences	Yes ruins plans	Yes, could be doing something else	Sometimes affects academic performance	Yes, affects daily routine	Yes, affects daily routine	Sometimes affects academic performance	None	None	None
Class Attendance Issues	Frequent	Late but rare case	No	A few times due to delays	Late but rare case	In some cases due to traffic and weather	Late but rare case	Not applicable	Not applicable	Not applicable
Psychological Impact	Affects focus	Overthinks being late	Not used to this type of travel	Affects academic performance	Affects academic performance	Overthinks about arriving on time	Causes stress	Causes stress	Experience stress	Experience stress
Weather Impact	Hot-prefers air conditioned transport	Hot-prefers air conditioned transport	Hot – prefers air-conditioned transport	Summer – doesn't feel like going to school	Hot – prefers air-conditioned transport	Hot – prefers air-conditioned transport	Hot – prefers air-conditioned transport	Hot – prefers air-conditioned transport	Hot – prefers air-conditioned transport	None
Gender Preferences	Safety concerns	Males use motorcycles more	Females prefer not to ruin appearance	Females take other modes for safety	Safety concerns and Females prefer not to	Females prefer not to ruin appearance	Safety concerns	Safety concerns and comfortability to travel	Safety concerns and comfortability to travel	Safety concerns and comfortability to travel

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Active Commuting Practices	Walking from Legarda Station-NU campus	Walking from Legarda Station-NU campus	Walking from UST(Espanya) to campus	Walking from Legarda to NU campus	Walking from Legarda to NU campus	Walking from Legarda to NU or UST Espanya to NU	Walking from Legarda to NU campus	Alay Lakad/ Walking from Baclaran to Carriedo	Biking from Baclaran to Manila	Walking
Health Benefits	Improves stamina and endurance	Improves stamina	Improves health and stamina	No noticeable changes	No specific changes noted	Improves lower body mobility	No specific changes	No specific changes	Improves stamina, endurance, and stronger bones	Improves health
Preference for commuting	Active commuting to save money	Passive commuting for convenience	Passive commuting for convenience	Passive commuting for convenience	Depends on distance	Active commuting for exercise and save money	Passive commuting for convenience and faster	Passive commuting for convenience and faster	Active commuting for health benefits	None
Awareness of TDM Policies	Uses student discounts	Uses student discounts	Not aware	Aware of policies	Aware of policies	Aware of policies	Aware of policies	Aware of policies	Aware of the policies	Aware of the policies

Effectiveness of Policies	Effective for saving money	Effective for saving money	Not sure, first time traveling alone	Effective for convenience	Effective for saving money	Effective with student discounts	Effective for saving money	Effective for convenience and cost less	Effective for convenience, comfortability and cost less	Not effective
Suggestions for Improvement	Priority lane for students	More public vehicles for students	Lower transportation costs for students	More train stations	Better traffic management	More personnel to manage traffic	Priority lane for students, senior citizens and workers	None	More personnel to manage traffic specifically on bike lanes	Widen the roads or expressways
Overall Satisfaction (1-5 five is the highest rate for very satisfied)	2	4	4	4	3	3	3	3	3	3

3.1. Results

3.1.1. Challenges Faced by Students

Traffic congestion is the one that stands out where it shows as one of the most significant challenges that most respondents had mentioned. The roads where students said they had experienced traffic were Magallanes Rd., EDSA, Roxas Blvd., Quezon Blvd., and España Blvd. This congestion results in delayed travel, which increases the stress level of students. Overcrowding was also mentioned, especially on train stations

such as LRT 1 and 2, where long lines for tickets and crowd crushing from passengers coming out of the train during peak hours were the common complaints that cause discomfort among commuters.

Delays and safety concerns were also highlighted as challenges in commuting. Students reported that technical issues with trains and traffic congestion affect their overall commuting experience. Safety concerns were emphasized by most respondents, especially regarding their personal security, and the impact of commuting on the psychological well-being of the students was evident, which causes students to experience stress, anxiety, the fear of being late or marked as absent, and the worry of travel conditions, which affected their focus and academic performance. Weather conditions, especially on hot days, show a significant influence on the choice of mode of transportation, with most respondents preferring to commute using air-conditioned transportation to avoid the discomfort of the heat.

3.1.2. Factors Influencing the Choice of Transportation

Cost-effectiveness was the most common factor that influenced students' choice of transportation. Most participants opted for cheaper travel but multimodal travel such as tricycles, FX, jeepneys, and walking to minimize their expenses. The need for fast and convenient travel was another reason why students prefer LRT 1 and LRT 2, which offer fast travel. Safety and comfort were also evident, especially for female students, who prioritized personal safety and comfort, which influenced their transportation choice by avoiding modes that they perceived as risky. Additionally, some respondents favored active commuting, such as walking or biking, for the benefits that it gives them and to save some extra cash.

3.1.3. Effectiveness of the Existing Transportation Policies

The student discount on public transportation shows the effectiveness of this policy in reducing costs and making it more affordable for most of the students who commute through multimodal travel. Policies that aimed at enhancing comfort and convenience were generally accepted, though there were suggestions for improvement. Respondents suggested different enhancements, including more public transportation dedicated to students, traffic management, additional personnel to manage traffic, especially on bike lanes, and wider roads to handle the high volume of commuters.

3.1.4. Comparative Analysis

The responses from different cities (Taguig, Pasay, and Parañaque) show that traffic congestion and overcrowding are common issues, though the specific problems are varied. For instance, respondents from Taguig and the eastern part of Paranaque highlighted EDSA, while those from the western part of Paranaque pointed to Roxas Blvd., Quezon Blvd., and España Blvd., and as for Pasay, no particular area since most of them use LRT transportation. Cost and convenience were also consistent factors across all respondents, regardless of where they came from. However, safety concerns were more prominent, especially among female respondents who prioritized personal security and comfort in their choice of mode of transportation.

Discounts were generally accepted across all cities, which suggests a widespread positive impact, but the effectiveness related to convenience varied, with some respondents pointing out the need for improvement in traffic management and an increase in public transportation in their areas. Overall satisfaction levels were mostly similar across different cities, where most respondents rated their satisfaction between 2 and 4 on a scale of 1 to 5. This kind of consistency suggests that while some policies are effective, the southern region of Metro Manila shares a common need for better transportation management and infrastructure.

3.2. Discussion

The results of this study shows various challenges, influencing factors and the effectiveness of the existing policies for the commuters from the southern part of Metro Manila to Manila. These results integrate and expand the body of knowledge on the commuting patterns and experiences of students which provide a comprehensive understanding of the complex aspects of student transportation.

3.2.1. Challenges Faced by Students

The thematic analysis shows that traffic congestion is a major challenge for students, which is consistent with the previous study that said traffic is a significant source of stress and time loss (Jamil et al., 2022). Some of the costs related to commuting may be lessened by focusing interventions on certain congestion hotspots, such as EDSA, Magallanes Rd., Quezon Blvd., and Roxas Blvd. Overcrowding on public transportation, especially trains, reflects the findings of (Lim et al., 2017), who pointed out that multimodal travel often leads to crowded conditions. Delays and safety concerns make commuting challenges even worse, especially for female students who are affected by safety issues, which supports the findings of Delmelle & (Delmelle 2012) (Hidalgo-González et al., 2022). The psychological effects of commuting, such as stress and anxiety, highlight the need for supportive policies to improve the well-being of commuting students, as also pointed out by (Taylor & Mitra, 2021) (Rellon et al., 2024). The preference for air-conditioned transportation in hot weather adds another layer to the commuting experience and highlights the need for climate-appropriate transportation options.

3.2.2. Factors Influencing the Choice of Transportation

Cost-effectiveness is the main factor that influences the choice of transportation of the students, which aligns with the findings of (Urmi et al., 2022) (Müller et al., 2008) that socioeconomic status significantly affects the commuting preference of students. The preference for faster and more efficient means of transportation, such as LRT1 and LRT2, is evidence of a desire to minimize journey duration and stress, which is highlighted in the findings of (Liu et al., 2022) that longer commutes negatively impact subject well-being (SWB) and mental health. Safety and comfort were important factors, especially for female students, this is supported by one of the studies conducted that found gender differences influence the choice of mode of transportation (Hidalgo-González et al., 2022). As for the health, some participants report that there are no noticeable changes in their health, which reflects the findings of (Jamil et al., 2022) that there is no correlation between weight gain and commuting, but some participants are inclined towards active commuting for health benefits, which aligns with the research of (García-Hermoso et al., 2018) on the physical health benefits of walking or biking.

3.2.3. Effectiveness of the Existing Transportation Policies

Student discounts on public transit were appreciated, suggesting that they were successful in lowering the cost of commuting. This finding is supported by (Lucia & Romeo, 2015) that a well designed policies can improve the commuting experience of passengers. Although the need for additional public transportation, improved traffic control, and specialized staff to police traffic, especially on bike lanes, raises questions about whether the policies in place are meeting the requirements of the students as a whole. Respondents 1 and 4 recommend to ease the students commuting experience by adding priority lanes for students and additional train stations which indicate a desire for detailed transportation solutions. The moderate overall satisfaction rating of the respondents (range between 2 and 4 on a scale of 1 to 5) suggest that the need for improvement in the transportation infrastructure and policies aligns with the findings of (Kakujo, 2022) on the mixed effectiveness of TDM policies.

3.2.4. Comparative Analysis

Comparative analysis show a common issues of traffic congestion and overcrowding across different cities (Taguig, Pasay, Paranaque) though there are issues on a specific area only. This correlation highlights how common these issues are and how important it is for coordinated transportation planning. Cost and convenience were the main factors while safety concerns are more reported among female respondents which highlight the need for gender sensitive transportation policies. The students' appreciation for the student discounts across different cities suggest that these policies are effective yet the different effectiveness of comfort and convenience policies suggests that specific improvements are required to solve particular transportation issues in various locales.

3.3. Limitation

This paper has several limitations that may affect the validity and scope of its findings. First is that the size of participants are limited to a small group of students which may not represent the entirety of the students that commute from the southern region of Metro Manila to NU-Manila. Furthermore, the geography is only focused on students who commute from the southern region of Metro Manila which may mean that the issues faced by NU students coming from northern region are overlooked. The data collected are all based on self-reported experiences which could contain biases which are exaggerated or underreporting. Other factors such as differences between weekdays and weekends or seasonal variation which are not included in our paper which could influence commuting experiences. The effectiveness of transportation policies are evaluated based on the existing literature and students opinions which may not provide a full range assessment of policy impact and lastly although this research explores the impact of active commuting on the physical health, it does not go into much detail about other possible health effects, like mental health problems brought on by stress from commuting.

4. Conclusion and Recommendations

This paper highlights the multifaceted challenges faced by NU students commuting from the southern parts of Metro Manila to NU-Manila. The main challenges include traffic congestions, overcrowding on public transportation, delays, safety concerns, and the psychological impact of stressful commutes. These findings align with existing literature and emphasize the importance of these issues especially in urban settings.

The key factors that influence the choice of mode of transportation among students were identified as cost-effectiveness, convenience, safety, comfort, and health benefits which also align with previous research that support the importance of these part to improve students' commuting experiences. Students satisfaction with the current transportation policies and infrastructure was found to be moderate; while student discounts on public transportation effectively lower costs, more public vehicles, improved traffic management, and increased safety measures are clearly needed; these findings suggest that current policies are inadequate and call for improvements in order to fully meet the needs of commuting students.

To alleviate these issues targeted interventions are necessary to reduce traffic congestion in designated hotspots like Roxas Boulevard, Quezon Boulevard, España Boulevard, EDSA, Magallanes Road, and more. These could include improving public transportation options, building more road capacity, and putting in place better traffic management systems. Enhancing safety measures and comfort in public transportation especially for female students, through increase security presence, traffic management and student focused policies which is designed for effectiveness and efficiency.

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