Mode Choice for School Trips: A Case Study in Schools Proximate to Mass Transit Stations in Bangkok, Thailand

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รูปแบบการเดินทางไปโรงเรียนของนักเรียน:กรณีศึกษาโรงเรียนในพื้นที่โดยรอบสถานีขนส่งมวลชนในกรุงเทพมหานคร ประเทศไทย

นายพันนาริทีเซน อ่อง

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
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Field of Study	Urban Strategies
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พันนาริทีเซน อ่อง : รูปแบบการเดินทางไปโรงเรียนของนักเรียน:กรณีศึกษาโรงเรียนในพื้นที่โดยรอบสถานีขนส่งมวลชนในกรุงเทพมหานคร ประเทศไทย. (Mode Choice for School Trips: A Case Study in Schools Proximate to Mass Transit Stations in Bangkok, Thailand) อ.ที่ปรึกษาหลัก : ผศ.เปี่ยมสุข สนิท

แนวคิดการพัฒนาพื้นที่โดยรอบสถานีขนส่งมวลชน (Transit Oriented Development หรือ TOD) เป็นสิ่งจำเป็นในการส่งเสริมการเดินทางด้วยระบบขนส่งมวลชนของนักเรียน เพื่อประโยชน์ทั้งในด้านสุขภาพกายและเสริมความเชื่อมั่นของสังคมในการเดินทาง ถึงแม้ว่าจะมีการพัฒนาระบบขนส่งมวลชนทางรางและเกิดการพัฒนาพื้นที่โดยรอบสถานีในกรุงเทพมหานครมาเป็นเวลาหลายสิบปี แต่กลุ่มนักเรียนก็ยังคงเลือกการเดินทางไปโรงเรียนด้วยรถส่วนตัว แม้ว่าที่ตั้งของโรงเรียนจะใกล้ระบบขนส่งมวลชน งานศึกษานี้จึงมีความสนใจว่า ทำไมนักเรียนที่โรงเรียนอยู่ใกล้ระบบขนส่งมวลชนถึงไม่ใช้ระบบขนส่งมวลในการเดินทางไปโรงเรียน ทั้งนี้ การเดินทางด้วยรถส่วนตัวอาจจะหลอมสร้างค่านิยมในเรื่องการใช้รถส่วนตัวเมื่อเติบโตสู่วัยผู้ใหญ่ ซึ่งจะส่งผลกระทบอย่างมีนัยสำคัญต่อสภาพแวดล้อมในเมือง มลพิษทางอากาศและการจราจรที่หนาแน่นเพิ่มขึ้น งานวิจัยนี้สะท้อนให้เห็นความจำเป็นของการที่จะสนับสนุนให้นักเรียนที่โรงเรียนอยู่ใกล้สถานีขนส่งมวลชน ได้ใช้ระบบขนส่งสาธารณะมากยิ่งขึ้น

ผลการศึกษา พบว่า ปัจจัยสำคัญที่มีผลต่อการเดินทางไปโรงเรียน คือ ความกังวลในด้านความปลอดภัย การได้รับอนุญาตจากผู้ปกครอง และค่าใช้จ่ายในการเดินทาง ความสำคัญที่เด่นชัดจากผลการศึกษาอีกประการหนึ่ง คือ ระดับความอิสระของเด็กจากพ่อแม่มีผลต่อการเลือกวิธีการเดินทางไปโรงเรียน และความถี่ในการใช้ระบบรถไฟฟ้ามวลชนในการเดินทางไปโรงเรียน ทั้งนี้ การใช้รถส่วนตัวของนักเรียนยังขึ้นอยู่กับปัจจัยที่สามารถบ่งบอกเศรษฐานะทางสังคม พฤติกรรมการเดินทางและลักษณะของการเดินทางด้วยเช่นกัน

การศึกษานี้จึงได้แสดงให้เห็นความสำคัญของความผลกระทบต่อวิถีชีวิตของค่านิยมการใช้รถส่วนตัวต่อพฤติกรรมการเดินทางของผู้คนที่อาศัยในกรุงเทพ โดยหวังว่าจะเป็นประโยชน์สำหรับนโยบายการออกแบบเมือง สามารถสนับสนุนและส่งเสริมให้นักเรียนใช้ระบบรถไฟฟ้ามวลชนในการเดินทางไปโรงเรียนมากขึ้น ตลอดจนสร้างทัศนคติที่ดีในการใช้ระบบขนส่งมวลชนได้อย่างมีประสิทธิภาพ

สาขาวิชา	ยุทธศาสตร์เมือง	ลายมือชื่อนิสิต .....
ปีการศึกษา	2566	ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

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KEYWORD: Children's independence mobility, Mode choice, Transit Oriented Development, Travel Demand Management, School Trip

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Transit-oriented development (TOD) is essential to promote independent travel and encourage mass transit use among students, which has several advantages for their physical well-being and boosts their confidence in society. Despite a decade of mass rail transit development and TOD development in Bangkok City, cars still queue to drop students at schools, even near transit stations. This presents a paradox: Why do students go to school in proximity to the mass transit system but not use the mass transit system? The high reliance on personal cars will inevitably shape children's transportation habits in adulthood, significantly impacting the city's air quality and exacerbating environmental pollution and traffic conditions. This research builds on the necessity for students attending schools near mass transit stations to use public transportation more.

This study reveals critical factors influencing school trips, including safety concerns, parental permission, and travel costs. Notably, children's independence levels from their parents affect their mode choice and the frequency of using mass transit for school trips. The socioeconomic, demographic, trip characteristics, and transportation traits explain students' high reliance on private cars.

A significant finding of this study underscores the enduring impact of the typical lifestyle of Thai households and their strong reliance on private cars on travel behavior in Bangkok city. The outcomes of this study provide valuable insights for urban strategic policies, advocating and encouraging students to use mass transit for school trips and normalizing its usage. This study holds potential benefits for BTS, MRT companies, and the Bangkok metropolitan administration in achieving their goal to promote mass transit.

Field of Study:	Urban Strategies	Student's Signature .....
Academic Year:	2023	Advisor's Signature .....

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Phannarithisen Ong

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1.1. Introduction

This study is to understand the paradox of using a private vehicle for a school trip in Bangkok, Thailand, although the school is near the mass transit station. This chapter provides the background of the research, problem statement, research significance, purpose of the study, research question, research hypothesis, and study benefits.

1.2. Background

Transit-oriented development (TOD) is a trend conceptual for urban planning and urban development involving the living, working, and activities in the center hub of public transportation infrastructure. TOD concepts create a mixed-use complex integrating residential, workplace, and commercial within the neighborhood, advocating walking, and purposely maximizing public transportation and reducing car use. Independent traveling for school trips in the TOD area significantly promotes children's well-being by encouraging physical activities, enhancing social skills, reducing parental stress, and reducing traffic congestion around the school area.

Thailand is one of the countries across Southeast Asian countries with rapid economic growth since the 1990s, which led to a rise in GDP (Daquila, 2005). In addition, economic growth leads to population growth, urban sprawling, urbanization, and decentralization. Bangkok is one of the busiest cities in Southeast Asia, full of opportunities that attract jobs, commercial activities, and tourism through shopping malls and tourist attractions. The fast-growing economy inside the country caused urbanization, urban sprawl, and expansion of middle-class households, whereas the distance between the residential households increased, and the activities in the inner-city center of Bangkok increased.

The big city hub is the center of opportunities, economic, cultural, political, government, innovation, and infrastructure. Therefore, it attracts movement and traffic flow into the city daily. The magnetism of the big city characteristic led to further development and urbanization in the city's surrounding area. The economic growth in

the city increases the land value, which creates a decentralization of the residential area to the city's suburban area.

People move to Bangkok city for better job opportunities and good education institutes. Henceforth, it is important for Thai parents to enroll their children in the best education institutes to have a promising future and get into top universities in Thailand. For instance, Chulalongkorn University is one of the top-rank universities globally and ranks top one in Thailand, located in the center heart of the city. According to the Ministry of Education, Bangkok comprises 70% public and 30% private educational institutions (2008).

On the other hand, a previous study conducted in the TOD area of Bangkok revealed a dominant daily trip purpose of 86.2% for work, 6.3% for education, 2.8% for shopping, and 4.7% for other purposes. Correspondingly, the studies found that private mode (car and motorcycle) is the most pricey mode but a primary dominant use in all zones (Charoentrakulpeeti et al., 2006). There is a low study concentration on school trips in Bangkok's TOD area, which is a concerning issue as daily school trips heavily focus in Bangkok's center and contribute to traffic congestion.

Consequently, working, learning, and third-place activities are involved in the inner city of Bangkok, which attracts heavy traffic daily. The primary transportation mode in Bangkok City is private vehicles which comprise car vehicles and motorcycles. According to the data from the Asia Pacific Energy Research Center show that Bangkok, Thailand, is one of the cities with immense growth in car ownership in Southeast Asia (Doi, 2005). Therefore, the rise of car vehicles and daily commuting into the city causes alarming congestion in Bangkok, affecting livelihood and air quality.

1.3. Study Area

This research examines Triam Udom Suksa School, Chulalongkorn University Demonstration Secondary School (Sathit Chula), and Patumwan Demonstration School (Sathit Patumwan). These three schools are located in the Patumwan district in Bangkok's city center. The students enrolled in these schools have distinct characteristics and backgrounds from various regions of Thailand. **Figure 1** shows the overview of the study area in the middle of the mass transit of Samyan MRT station and Siam BTS station. The following section is a breakdown of the characteristic context of each school based on the distance, connectivity, accessibility mode choice, and walkability.

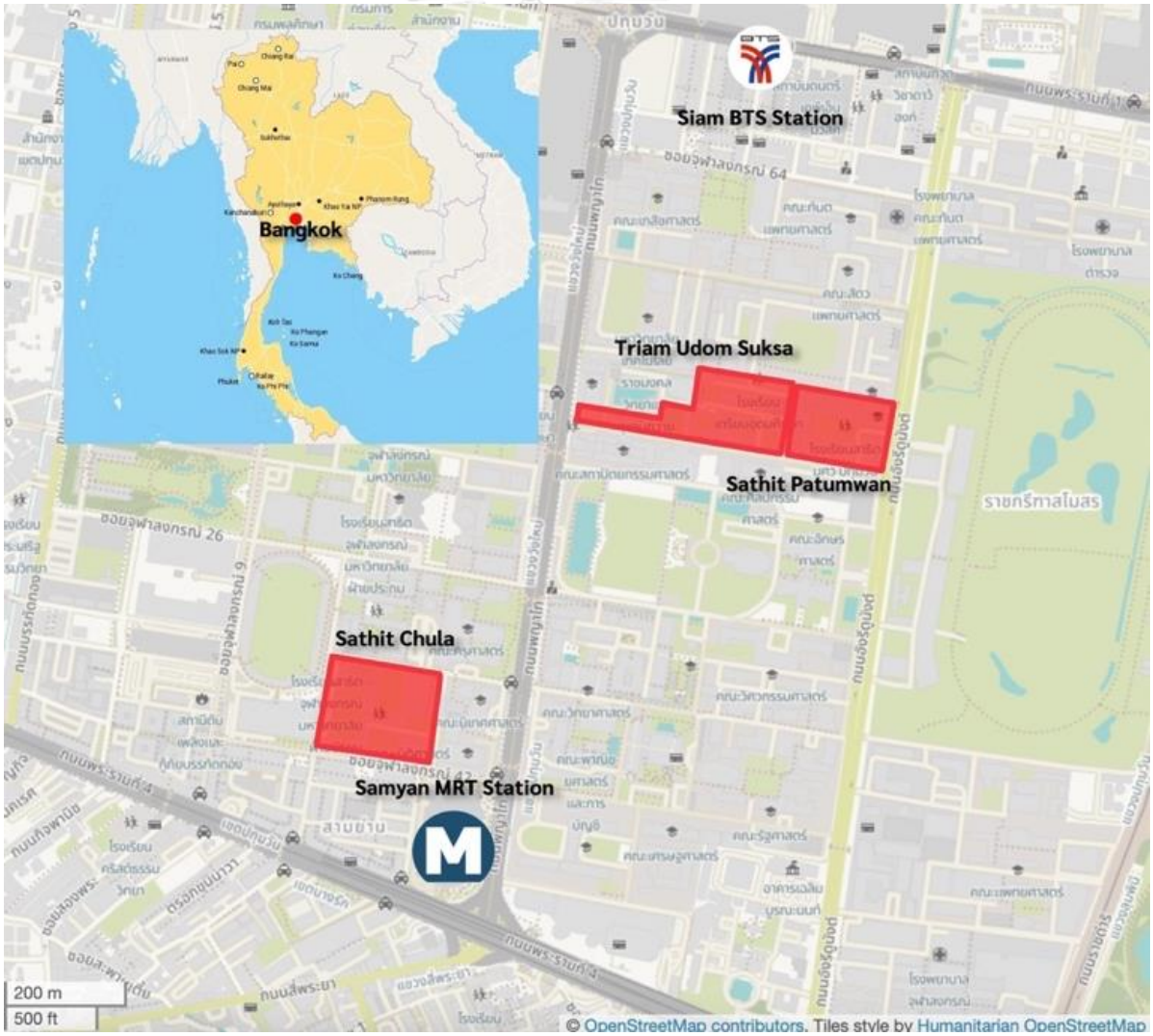


Figure 1 Study area for this research

1.3.1. Context of Study Area

- **Chulalongkorn University Demonstration Secondary School (Sathit Chula)**

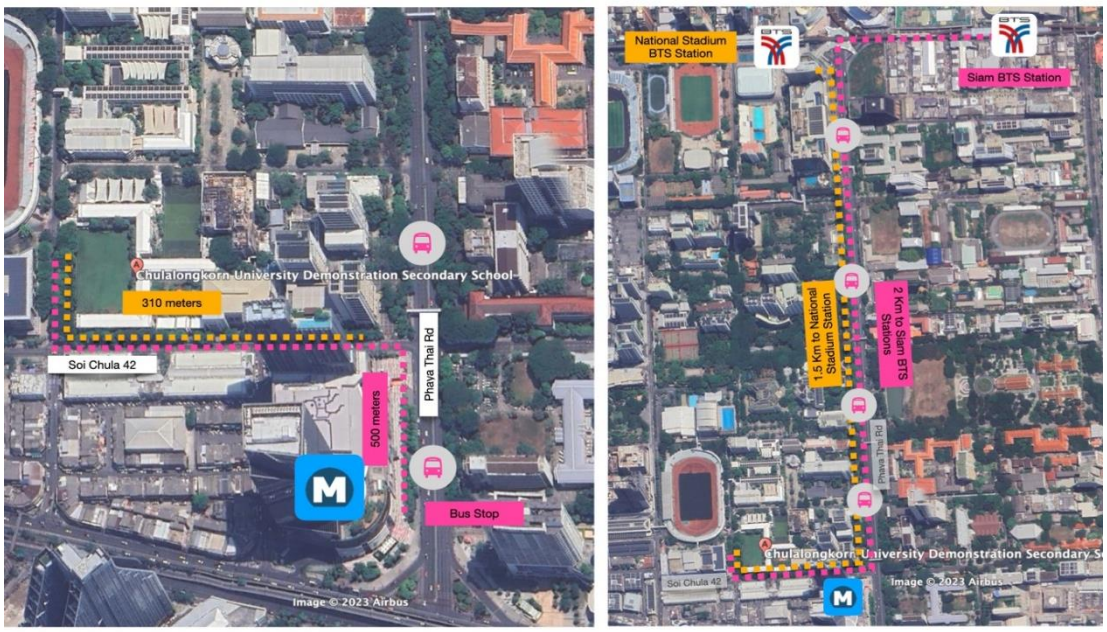


Figure 2. Chulalongkorn University Demonstration Secondary School Site Accessibility

Sathit Chula is a demonstration school with a good reputation for its excellent academic program, and this school is very selective about which students should enroll. Students who can enroll in Sathit Chula are family members of a faculty staff working at Chulalongkorn University. Therefore, being accepted into Sathit Chula School is competitive and challenging.

Figure 2 illustrates that Sathit Chula school is accessible from the Samyan MRT station, 310 meters by walking. Samyan MRT station is located under the Samyan Mitrtown shopping center, which comprises F&B, retail stores, co-learning space, language classes, etc. Among students, Sathit Chula has the shortest distance to Samyan Mitrtown the most. In addition, a bus stop is available next to the Samyan Mitrtown station with additional walking distance and about 500 meters from the school gate.

Moreover, students from Sathit Chula can access the National Stadium BTS station located right next to MBK Shopping Center with a 1.5 km distance and a 2 km distance to Siam BTS Stations along the Phaya Thai Rd.

- **Patumwan Demonstration School (Sathit Patumwan)**

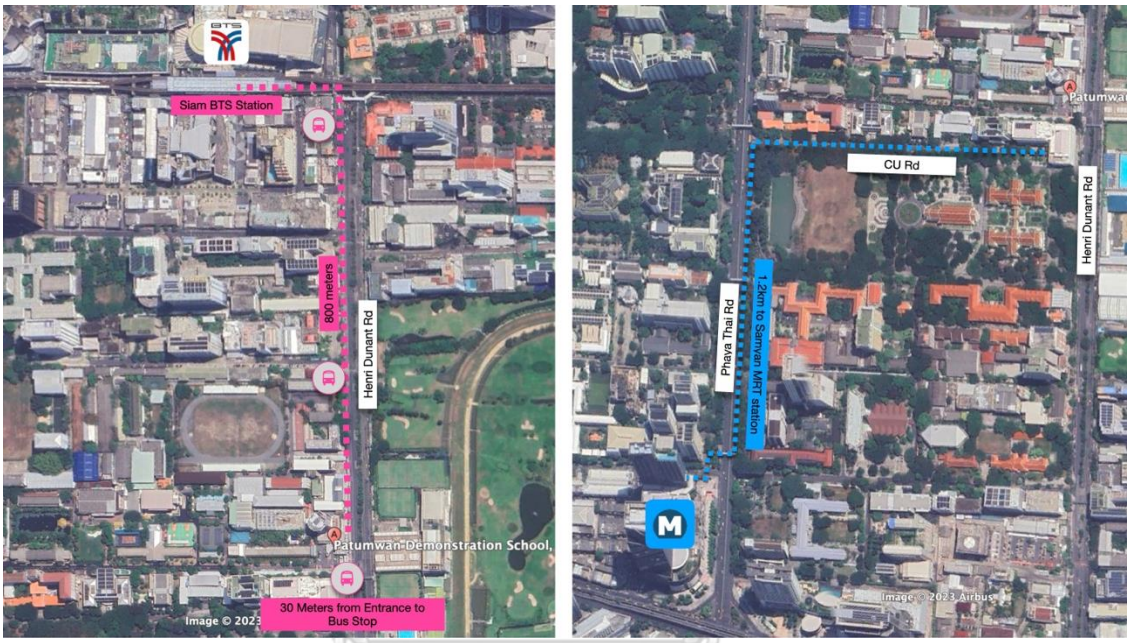


Figure 3. Patumwan Demonstration School Site Accessibility

Sathit Patumwan demonstration school is a neighboring school to Triam Udom Suksa alongside Henri Dunant Road, with outstanding academic and international programs. Students who enrolled in this school are believed to have originated from different parts of Bangkok.

Figure 3 illustrates three bus stops connected from the Sathit Patumwan school to the Siam BTS station. According to Google Earth measurements, the nearest bus stop is right in front of the entrance gate, about 30 meters away. In addition, the students can walk from Siam Station by taking exit 6, then walking on the Skybridge, taking off at the exit on Henri Dunant Rd, and walking about 600 meters from the Skybridge exit. Therefore, students can walk from the school to Siam BTS Stations at a total distance of 800 meters distance.

Furthermore, another choice, Sathit Patumwan student, can also access the MRT station at Samyan Mitrtown by walking through Chulalongkorn University along CU Rd to Phaya Thai Rd and crossing over the skybridge overpass with a total distance of 1.2 km.

- **Triam Udom Suksa School**

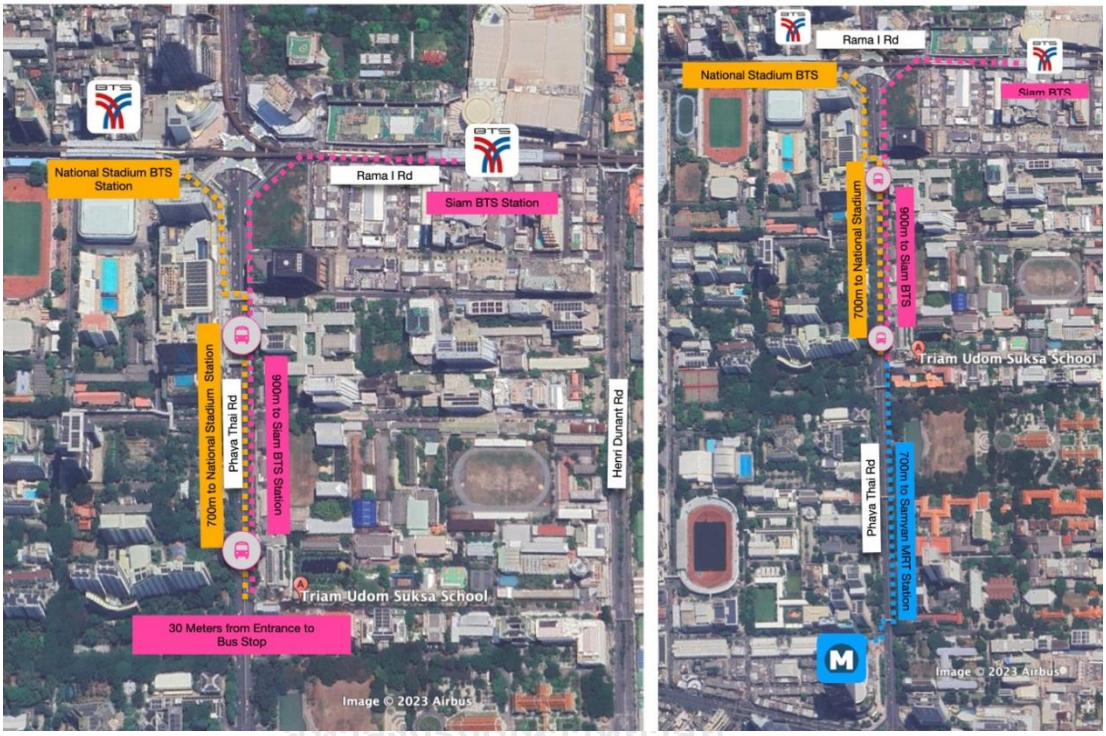


Figure 4. Triam Udom Suksa Site Accessibility

Triam Udom Suksa School is one of the best schools in Thailand, with outstanding academic programs and a large yearly enrollment. In addition, it is also one of the competitive schools to get enrolled, and students must have the best score in the academic exam to enroll in this school. Moreover, the school values high achievement and accomplished students; therefore, many students enrolled in this school were highly selected across the province of Thailand.

Triam Udom Suksa School is located next to Phaya Thai Rd, which is accessible by mass transit of BTS, MRT, and bus. According to **Figure 4**, there is a bus stop along Phaya Thai Rd, and the nearest stop to this school is next to the school entrance gate,

which is about 30 meters, based on Google Earth measurements. In addition, students can reach school from the Siam BTS station by exiting Exit 2 and walking along the Rama I Rd pedestrian, then turning left and walking down Phaya Thai Rd. Moreover, students from the National Stadium can take off at the Connect Sky Bridge at the intersection, then walk down Phaya Thai Rd and cross the road by the overpass bridge. Furthermore, students can also get to school from Samyan MRT station by walking along Phaya Thai Rd, which is about 700 meters away.

Pedestrian Environment

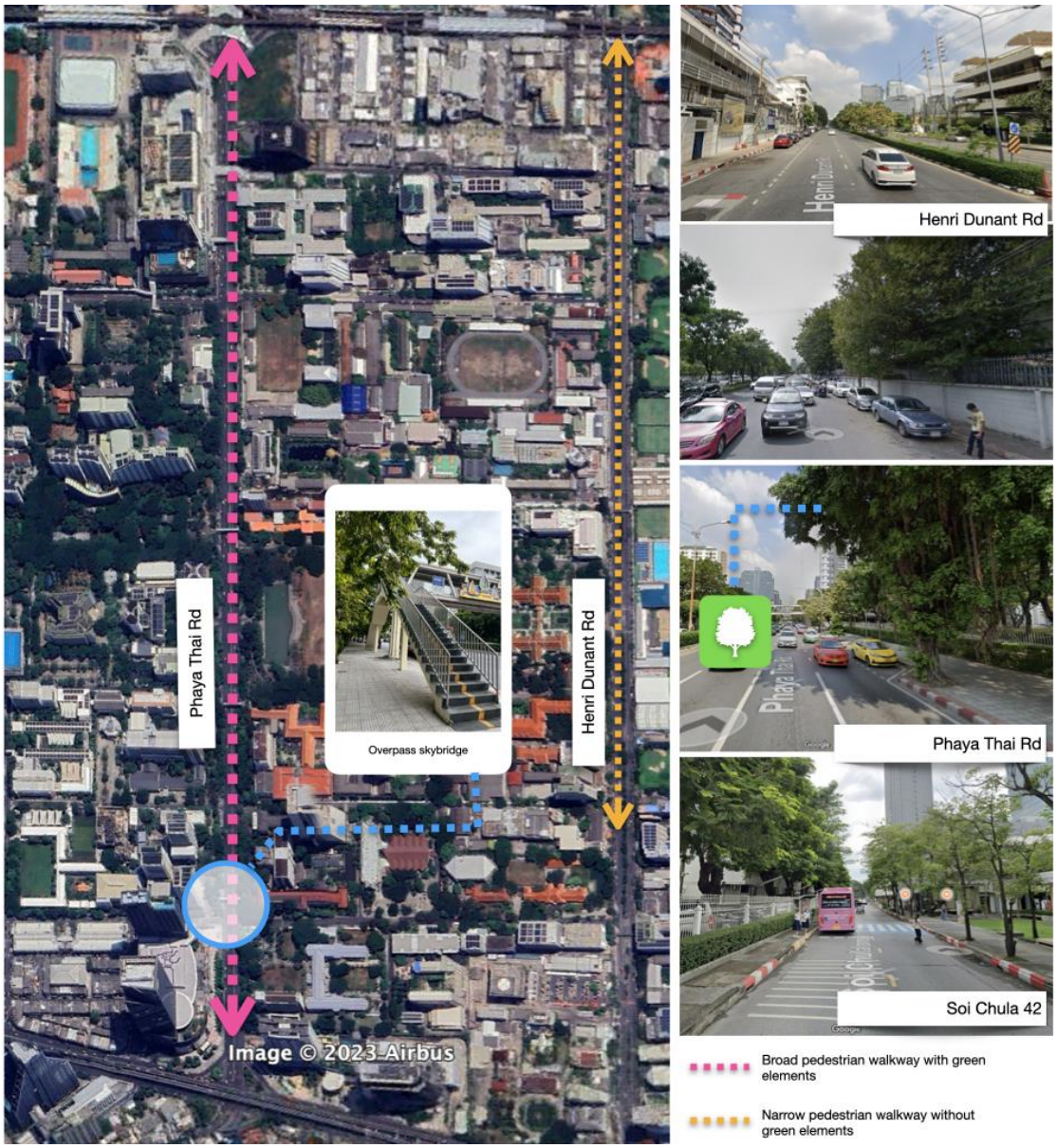


Figure 5. Pedestrian Environment

Pedestrian conditions along Phaya Thai Rd are broader and have more of a greenery element on the pavement, which, compared to Henri Dunant Rd, is slightly better. On the other hand, the pedestrian along Henri Dunant Rd is narrow and lacks a tree element, and cars can be seen parking along the side road and lack a sense of 'eyes on the street.' In addition, both roads have an overpass sky bridge to ensure safety for road crossing. However, the Soi Chula 42, which connects to the Samyan Mitrtown, has a friendly

walking environment with a shaded tree and crossing zebra to ensure safety for the students when crossing the road.

Feeder Mode

Besides walking, these schools are accessible to available feeder modes that connect to mass transit stations such as EV Chula Pop-bus, Tuktuk, E-scooter, shared bike, and motorcycle taxi (Wyn) that are located nearest to the exit of the mass transit station of BTS and MRT.

Chula Pop-Bus is a shuttle bus run by Chulalongkorn University free of charge and operates on electric energy, which is environmentally clean and sustainable. These three schools are privileged to access feeder mode for free, fast, and convenient. According to **Figure 6**, there are five bus lines connected throughout this area, which students can access from their nearest location.

The fastest route for Triam Udom Suksa and Sathit Patumwan students is bus line no.1, which students can access from exit 6 of Siam station at Chalerm Phao Junction or exit 2 from Lido building. The bus will stop at the bus stop in front of Triam Udom Suksa School, which is convenient for the student to walk directly into their school. In addition, Sathit Patumwan can get off at the Faculty of Arts of Chulalongkorn and walk to the nearest route as the shuttle will detour back to Sala Phra Kieo.

In addition, the fastest route for Sathit Chula students from the Siam BTS stations is bus line no.4, which students can get on the shuttle bus, the same as bus route no.1. Moreover, students from National Stadium BTS station can get on bus route no.2 which students can get off at Chamchuri 9 stop and continue with walking.

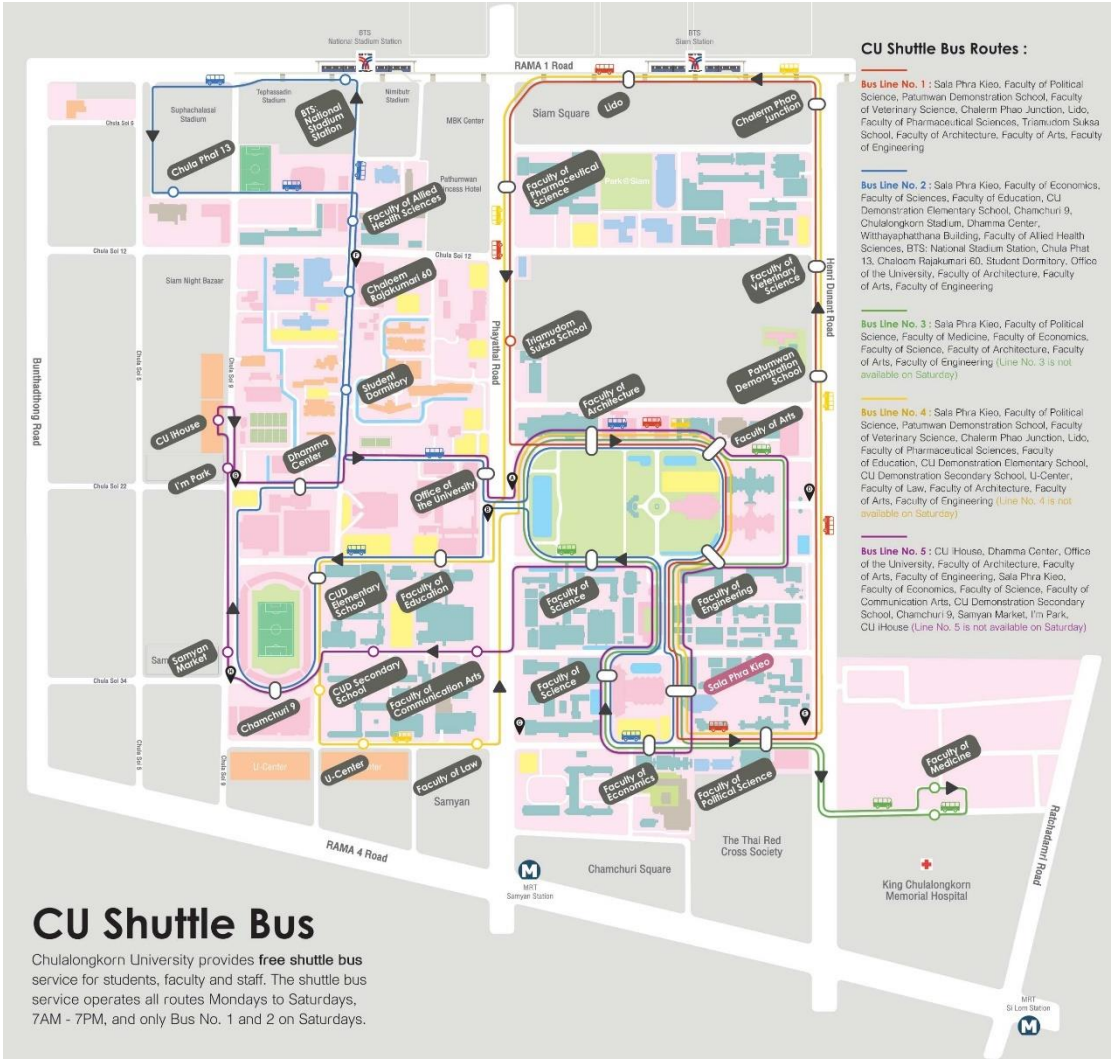


Figure 6. CU Shuttle Bus Map

Therefore, students taking BTS daily from Siam Station can go back home by bus No.1 and bus No.4 from their school and take off at the Chalerm Phao Junction stop. In addition, students who go back home from BTS National Stadium station can take bus No.2, which will drop off at the station. However, students who are going back home by MRT suggest taking bus No.4, which is the fastest route, and dropping off next to Samyan Mitrtown.

Moreover, there are optional feeder modes for students to pay to use around the school area, such as an E-scooter by Beam, a shared bike by Anywheel, and a Muvmi E-shared Tuktuk. It is a smart mobility in which students can easily use their smart mobile phone to book or pay for the service. The seamless accessibility of the feeder mode to the main public transportation line increases connectivity and makes it more convenient. For instance, the Beam E-scooter launched its operation with PMCU with their goal to increase connectivity via active mobility and make it faster and more convenient for users who want to travel from point A to point B with a safety measure, speed limit, age limit, and limit riding zone. Currently, 180 E-scooters are operating, and 40 parking spots are available for students, teachers, university staff, and the general public to access the area (*Smart mobility*, 2023).

Based on the characteristic context of these three schools, they can categorized as high-level TOD schools in terms of diversity of public transportation and feeder mode, good connectivity, walkability, proximity to mass transit, surrounded commercial buildings, residential, offices, and pedestrian-friendly and with safety measure with the over passing crossing bridge.

In sum, these students are walkable from BTS stations of Siam and National Stadium, Samyan MRT station, and bus located along Phaya Thai Rd and Henri Dunant Rd. As the figure illustrates above, Sathit Chula School has the shortest walking distance from the MRT station but the longest distance to both BTS stations. On the other hand, Triam Udom Suksa and Sathit Chula are located in the middle of the BTS and MRT, but it is faster and shorter to reach the BTS station than the MRT station.

Regardless of the accessibility, connectivity, availability of public transportation, and feeder mode among these schools, based on observations, private cars are lining up to drop off and pick up students during school drop-off and pick-up times, increasing

traffic volume during peak hours. Moreover, the low number of students on mass transit causes a concern due to high reliance on private vehicles. The study from three schools could be an excellent example for schools with similar characteristics nearest to mass transit stations in Bangkok. This could serve as a potential pilot project for future research on school trips among high school students in similar settings near mass transit stations in Bangkok.

1.4. Problem Statement

BTS sky train is the first mass transit railway system introduced in Thailand in 1999 which is an elevated railway system that operates above the ground and runs across the road. In addition to this, the BTS railway system consists of 23 stations and two lines in total and continues to extend its lines gradually and expand more operations since 2009 (n.d.). Today, the BTS railway system operates across Bangkok and connects two provinces, Pathum Thani and Samut Prakan, to Bangkok's inner city in a total of 62 stations. In 2004, Bangkok Expressway and Metro (BEM) opened an MRT system, the second mass transit railway system and the first underground railway operated in Bangkok City that moves below the ground and connects to the BTS line. The first MRT line, the Blue, operated 20 kilometers from Bang Sue to Hua Lamphong, comprising 18 stations. In addition, MRT continues to expand its elevated railway and underground railway service to more stations from Bang Sue to Bang Khae for 16 kilometers with 11 stations operation and from Bang Sue to Tha Phra for 12 kilometers with nine stations operation (n.d.).

Although Bangkok's mass transit system has existed for more than two decades, the residents are highly reliant on the private mode to commute due to the lack of car demand control, and parking restriction encourages people to buy more cars. A study found that the car ownership rate in TOD residential within walking distance of mass transit was not lower than in non-TOD residential, which leads to congestion during peak hours, ranking second most congested city in the world (Pongprasert & Kubota, 2017).

Promoting mass transit has become a target to reduce congestion and private car user across Bangkok cities. However, a study shows that Bangkok's transit-oriented development (TOD) concept is unsuccessful. The residents along the mass transit corridor commute daily by private car rather than using mass-transit transportation, although they live close to a walkable distance of mass-transit stations (Pongprasert & Kubota, 2017).

The average time drivers spend in traffic jams is 64.1 hours yearly, equivalent to almost three days (Pongprasert & Kubota, 2017). Therefore, heavy traffic congestion makes Bangkok City vulnerable to the global environmental impact of carbon emissions from car vehicles. Thus, the frustration from the congestion lead to stress and increases blood pressure and chronic stress, which affects the quality of life in Bangkok city as well (Witchayaphong et al., 2020).

The environment in the city can affect children's development and adulthood as they grow up. Children rely on their parents to chauffeur them around, whether for activity or school trips, until they go to a university where they can drive their vehicle or take public transportation. The amount of time children spend on the road in a congested city can affect the child's quality of life and physical and mental health. However, a study revealed that the high dominance of private vehicles could influence the children's perspective on choosing a private car as the primary mode choice in adulthood (Fyhri & Hjorthol, 2009).

Based on the observation, there is a lack of high school students on mass transit for school trips, although their school is in a mass transit region. A high school student was considered a youth who was physically better able to perform certain activities than a secondary school student. However, a relatively low number of high school students go to school by mass transit and are still being dropped off by a private car.

1.5. Research Significance

This research aims to propose a specific policy and urban strategies for this area by understanding the relationship between the factors that affect mode choice in this school context. Moreover, the policy proposal will help to promote more student passengers on mass transit, which will help reduce the congestion in this school area and improve the quality of student life.

1.6. Purpose of the study

1. To identify factors that affect the frequency of use of mass transit systems for school trips for high school students who go to Sathit Chula, Triam Udom Suksa, and Sathit Patumwan School.
2. To understand the paradox puzzle of why students still go to school with private vehicles although their school is located next to a mass transit station.
3. To understand students' perception toward using BTS and MRT mass transit for school trips.
4. To propose coping policies and strategies to promote public transportation for school trips and improve the quality of life for students.

1.7. Research Question

Promoting children on mass transit will help reduce the parent's burden to drive their children to school and reduce traffic on the road around school. In addition, it also helps improve children's quality of life and physical health, enhance child social skills, and shape their perception of using public transportation as they age. Therefore, this led to a research question:

1. Why do students who go to school locate next to the mass transit system, use, and do not use mass transit system?
2. What factors affect the frequency of using MRT and BTS?
3. What is the student's perception and attitude toward the mode choice for school traveling?

Based on the research question, it formulates the hypothesis built on the assumption that the higher the level of independence of the students from the family, the higher

chance of students having their travel independence. In addition, socioeconomic, sociodemographic, and transportation characteristics is a variable that influences the student's trip characteristics. Therefore, this study can help identify the different groups of student travel mode choices and give a detailed answer to the factors affecting a group of students.

1.8. Research Hypothesis

The level of independence from the student's family affects the student's mode selection for a school trip.

1.9. Scope of the study

In a previous study of children's independent mobility in Denmark, Finland, Great Britain, and Norway, the age range from 6-16 years old that are participating in the study (Fyhri et al., 2011). Moreover, the survey for a study of children's independent mobility in Japan extends to the student age range from 7-15 years old (Drianda & Kinoshita, 2011). Understandably, the developed countries' age range cover elementary class to upper-class student due to cultural and demographic differences.

However, in this study, independent children are defined as high school students studying at the upper-secondary level, with an age range typically between 15 and 18 years. These students may or may not live with guardians. High school students are a significant representative age group for children to travel independently to school, given that they are young adults transitioning into full adulthood. Moreover, considering that mass transit in Bangkok has developed over the decades, these students were born in the TOD era; thus, they should be familiar with the system and have normalized the use of rail mass transit.

According to New Oxford American Dictionary, children is a plural term for a child, defined as a young person below the age of puberty or the legal age of majority (Stevenson & Lindberg, 2010). Therefore, it is an obligation for a parent to chauffeuring their children around everywhere. However, previous studies show that the consequence of children being highly reliant on car travel is becoming less productive physically and increasing the number of car traveling (Fyhri et al., 2011). It is crucial for children to adapt and weld their mindset into using mass transit for school trips. Therefore, it increases the probability and normalizes the use of mass transit for their activities trip. Hence, for this study, school travel refers to a daily trip from home to school and from school to third place for weekday extracurricular activities. School travel can be done by walking, cycling, chauffeuring by parents, and public transportation. However, this study will focus on weekday trips other than weekend trips for students because they might spend time with their families; therefore, it only investigates school trips.

2. Chapter 2: Literature Review

This chapter reviews the research literature to explore the variable that affects the travel mode choice and further extend the research availability. A recent study has shown that socioeconomic, sociodemographic, and transportation characteristics affect children's independent traveling rate over the past year. Children travel independently is crucial to their quality of life, keeping them physically active, increasing social skills, reducing the burden on parents, and reducing traffic congestion around the school area.

2.1. Socioeconomic & Sociodemographic

2.1.1. Middle-class Household Income

Socioeconomic and sociodemographic substantially impact the transportation mode choice and influence traveler behavior, essential for shaping the transportation pattern and social mindset. Thus, transportation mode choice is crucial for environmental health and public health. These factors include household income, accessibility, cultural mindset, education, and social awareness.

The rise of the national economy contributes to increased household income and expands the middle-class household. It simultaneously causes urban sprawl, urbanization outward the city, affecting developing countries' urban infrastructure and travel behavior. For instance, Bangkok is the capital of Thailand, one of the countries with rapid economic growth since the 1990s (Daquila, 2005). Therefore, the expansion of the economic growth and middle-class households led to a new lifestyle and expansion of the household family. Adapting to the new middle-class style led to a new settlement in a larger residential development plot outside the city. In addition to living outreach of the public transportation infrastructure, a materialistic lifestyle influences multiple car ownership, resulting in a significantly high car-dependent orientation.

In the study of six districts of Bangrak, Yannawa, Bangna, Bangkhen, Minburee, and Bangkuntien, with characteristics of middle-class households, private vehicle (car and motorcycles) is the highest transportation mode preference chosen by the participants from all house zones (Charoentrakulpeeti et al., 2006). Data from the Asia Pacific Energy Research Center show that Bangkok, Thailand, is one of the cities with immense growth in car ownership in Southeast Asia (Doi, 2005). Therefore, the rose of car vehicles causes alarming congestion in Bangkok city that affects the livelihood and air quality of the town. The higher income household would own multiple vehicles to complete the different tasks and individual journeys (Dissanayake & Morikawa, 2010).

Similarly, the case of Ho Chi Minh City, which evolved through urbanization and the emergence of migration into the city, led to the rise of the transportation demand in Ho Chi Minh City. Hence, due to its demography, it is the biggest city in Vietnam, with perfect weather, economic status, and public facilities, making it a great city to live, study, and work in. Therefore, these extraordinary features of HCMC attract about 130,000 domestic immigrants into the city yearly for better opportunities. However, the overwhelming migration into Ho Chi Minh City led to a high demand for transportation, which the public transportation system still limited and needed more quality. Therefore,

a large young population relies on private modes as primary transportation. In addition, the motorcycle is the highest preferred mode choice by most HCMC populations due to the city's urban layout. Consequently, this leads to road congestion and poor air quality in the city (Le & Trinh, 2016).

A study in Danang City, Vietnam, shows the exact characteristics of middle-class and high-income households, with 57% of residents traveling by private vehicle to university while only 40% from low-income households (Nguyen-Phuoc et al., 2018). Although the primary private mode in this case study is a motorcycle, it is evident that a higher ownership rate of vehicles within households leads to high dependency on the private mode choice for school trips. Indeed, this demonstrates that vehicle ownership significantly increases the likelihood of using it and the probability of high dependence on private transportation.

A study in Beijing, China, reported there is a school attendance zone policy which required residential owner to only eligible to send their children to school base on their zone. However, the characteristic of the middle-class household tends to send their children to a good high-quality school outside of the residential zone. Data from the study revealed that 53.3% of students living in a residential are outside of the school, about a 2 km radius away. However, school bus was not a high preference among these schools due to safety issues, which resulted in most parents chauffeuring their children by car mode (Liu & Ying, 2011). In addition, a case study in Beijing, China, revealed that driving to school contributes significantly to overall congestion, accounting for around 20% of it. Therefore, this study highlights that congestion tends to increase more rapidly than the number of vehicles during peak times (Lu et al., 2017).

2.1.2. Household Location

The household location is an essential component of accessibility to the mass-transit station and influences children's independent mobility. A study suggested that living in

a high-density area around mixed-use buildings and the mass-transit station significantly increases the use of mass transit and the accessibility to mass-transit stations. In addition, the population in high-density area encourage the use of non-motorized mode, which enhance children's physical movement and is crucial for children's independent traveling (Waygood & Kitamura, 2009).

Furthermore, a large population in a high-density area is more advantageous for children to travel, which has a shortened traveling distance together with traveling time and increased security and eyes on the street in the area. For instance, a study from Japan revealed that children who lived in the capital city (Shinagawa City) 100% of the children from age 10-12 years old granted approval to travel from school to home alone, and in that 90% were allowed to cycle and cross the road by themselves. Surprisingly, more than 93% of children from age 13-15 years were allowed to travel alone within walking distance area for leisure activities (Drianda & Kinoshita, 2011).

Moreover, a study in Japan shows that living in a high-density area allows children to actively walk on the pedestrian and increase their social skills in the neighborhood, which helps them interact face-to-face with the people they see on the road. Therefore, bonding and connecting with the community on the street help boost their confidence as they age and influence their social skills more than the kids traveling by car (Waygood & Friman, 2015).

In contrast, a study of middle-class patterns in Bangkok, Thailand, found that the older generation resident lives in a High-density zone (HDZ); meanwhile, a younger generation with good education and white-collar workers live in the middle-density zone (MDZ) and lower-density zone (LDZ). Nonetheless, HDZ, or the inner city of Bangkok, is a core hub for business, office, commercial, and education, increasing commuting inward into the inner city daily (Charoentrakulpeeti et al., 2006).

According to the respondent shows that 41.3% of the 63% of residents from the MDZ commute in the HDZ; meanwhile, 55.5% of the 64% of residents from the LDZ travel into the MDZ and HDZ. Surprisingly, residents in the HDZ are primarily self-employed and travel to work in their zone an average of 7.4 km; however, household of HDZ has higher car ownership than MDZ and LDZ residents (Charoentrakulpeeti et al., 2006). Furthermore, 65% of the respondents from the residents in the HDZ use private mode for commuting, which is very high, regardless of the higher accessibility to the mass transit of BTS, MRT, and public bus. Moreover, 55% of MDZ and 53% of LDZ respondents commute in private mode, increasing the traffic flow into the city and causing traffic jams (Charoentrakulpeeti et al., 2006).

The expansion distance between the household and the city center is an influential factor that negatively impacts the independence of traveling and the use of public transportation. A study in Norway revealed that the factor that causes the declining number of children who travel independently to school is due to the increase in the distance between home and school, which is more convenient to go by car (Fyhri & Hjorthol, 2009).

2.1.3. Culture and Social Norms

Culture and norms have different influences on child independence traveling in the Western world and Japan. According to the studies, in Western culture, children look up to their mothers the most; therefore, mothers play an essential role model for their children. Consequently, it is pressuring Western parents to accompany their children to each activity and be responsible for taking them back safely. In addition, western parents always keep an eye on their children, making their children very vulnerable in public spaces and affecting their social bonding and independence. On the other hand, Japanese children can independently complete different tasks and travel on public transportation by themselves, which increases their social skills and sense of place (Waygood, 2011).

Japanese children from 10 to 11 years old travel to school on the subway or walk without their parents, while children in Western rely on their parents to travel. According to the studies, 65% of a parent in the United States spent their time chauffeuring their children, whereas Japanese parents spent less than 15% traveling with their children (Waygood, 2011). Children chauffeur has become a burden to a parent because they have to spend more time on the road, which leads to arriving late to work, restricting work hours, and possibly preventing work which is put more pressure on the single mom or single parent (Waygood, 2011).

Furthermore, Japanese parents find it essential to have a strong bonding relationship with the local “family” and “community,” which allow their children to socialize in the neighborhood to boost their relationship with people around and increase their confidence in the public (Waygood, 2011). Another point suggested that the built-in environment affects child travel independency and could reduce the parenting burden of chauffeuring their children. However, a built-in environment can also limit children’s independent travel; therefore, there should be connectivity from the street to the mass transit station to increase walkability.

Moreover, increasing intersections in the urban neighborhood will increase connectivity in the urban context and allow the walking user to reach their destination in a shorter range (Waygood, 2011). Unfortunately, people who live far from the destination are likely to use private motorized transportation options, and those who live in a neighborhood far from mass transit stations are discouraged from child travel independently.

2.2. Transportation characteristics

2.2.1. First mile & Last mile

The first and last-mile trips are crucial in urban mobility and mode selection. The 'first mile' involves the journey from an initial location (e.g., home) to public

transportation stations (bus or train stations), while the 'last mile' is a continued journey from public transportation stations to the final destination (e.g., home, work, and school). A study conducted in Singapore effectively demonstrates the high correlation between the built environment and attitudes toward first and last-mile travel. A result shows that 69.06% of respondents walked directly to the nearest MRT station from their residential area, while 27.75% used buses as feeder modes. Therefore, the availability of public transportation and its proximity significantly impact mode selection (Mo et al., 2018). The study highlights that attributes such as built environment, land usage, and socioeconomic activities significantly shape attitudes towards first and last-mile travel, thereby impacting travel mode choice.

Household location variables and accessibility to mass transit play an essential role in influencing the utilization of public transportation and interwind with the travel mode choice. A study in Bangkok, Thailand, illustrates how seamless access and minimum distance to mass transit stations influence the probability of using public transit. Among Thai participants, 50.34% favored public transit when the distance to the station was less than 500 meters. Conversely, 46.99% of respondents preferred private vehicles within the same proximity, influenced by socioeconomic factors. Notably, the farther away the location of the household from the mass transit station, the higher the chance of Thai travelers choosing to drive their private vehicle (Witchayaphong et al., 2020).

Furthermore, the physical and urban designs significantly affect children's ability to use non-motorized transportation and move around. A study shows that an increased number of intersections helps to influence closer walking distance, providing better connectivity and allowing children to reach their destination in a shorter path (Waygood, 2011). In addition, the tree plants along the sidewalk provide shades that comfort the children while walking to mass transit in Taiwan; however, the hilly typography in the suburban area is a factor that discourages the children from walking (Lin & Chang, 2010).

2.2.2. Travel Cost and Travel Time

Travel cost and travel time variables closely go hand in hand and significantly influence travelers' mode selection. Given that each individual has a distinct daily budget, the limitations presented by travel expenses become a primary concern and importance in shaping their everyday travel decisions. Additionally, the availability of transportation could also determine the mode choice, such as private or public transportation. Travel time also plays a crucial role in influencing each mode's choice regarding travel duration, reliability, time essential, and distance. A study from Texas on an examination of students' mode choice supported that the travel cost and time are important factors(Mahlawat et al., 2007).

A result from a study in Ho Chi Minh City revealed that the ‘travel time’ has an impact on the mode choice for students. The ‘travel time’ variable had a negative coefficient, which was found statistically significant in the motorcycle mode choice, which indicates the probability of the student choosing private mode is low when the travel time increases. Students express a safety concern and risk of traveling on a motorcycle for a long distance and long travel time. Although the travel cost was not included in the survey among the student group, factors such as traffic congestion, traffic accidents, damaged vehicle, and high travel cost are influencing students to switch to public bus service (Le & Trinh, 2016).

On the other hand, the ‘traveling cost’ variable was highly impacted by the mode choice among the worker, which resulted in a negative coefficient. The worker expressed concern over the increase of high travel costs over excessive fee on high fuel costs and parking fees which it comparably low to the bus tickets. Therefore, the probability of the mode shifting to public buses increases when the travel cost increase (Le & Trinh, 2016).

Furthermore, a study in Thailand showed a negative coefficient relationship between travel time and household car owner, which demonstrate that if the ‘travel time’ variable increase, the probability of choosing a private car is high (Witchayaphong et al., 2020).

In some cases, individual mode selection is interwind by the travel cost difference and availability of transportation. An investigation of the travel pattern of middle-class in Bangkok revealed that 54% of the resident in the six districts of Bangrak, Yannawa, Bangna, Bangkhen, Minburee, and Bangkuntien are accessible to public transportation stations from a resident in 500 meters. Surprisingly, despite the accessibility to the stations, the respondents' highest predominant mode of public transportation is a bus rather than railway mass transit (Charoentrakulpeeti et al., 2006).

2.2.3. Travel Attitude

In the previous study, travel attitudes such as comfort, convenience, security/safety, and reliability are the factors that influence the mode choice. A study has conclusively shown that comfort and flexibility is the priority that influences the mode choices among university students and worker in Ho Chi Minh City, Vietnam. The corresponding from the participants indicates that the probability of people choosing a private vehicle over public transportation is high when the waiting time variable increases. Therefore, people in Ho Chi M nh City rely on private mode choice over public transportation based on independence, convenience, flexibility, and time efficiency (Le & Trinh, 2016).

Additionally, a study in Great Britain and Demark shared apprehension among parents regarding their children’s safety, which motivated the parent to chauffer their children to school. Many individuals expressed concerns about unforeseen traffic threats and the potential of assault molestation from strangers. Correspondingly, a parent in Norway and Finland echoed a similar concern with their children's safety as

the primary top priority and fear of traffic danger, resulting in an obstacle to children's independent trips. Likewise, a study in Norway reveals that despite the barrier from residential to school increase in distance, convenience is a significant factor influencing their children in a private mode due to the same destination as the workplace. Consequently, high reliance on private mode will influence their transportation choice in adulthood (Fyhri & Hjorthol, 2009).

2.3. Trip characteristics

2.3.1. Trip Purpose

According to the study of middle-class attitude from five districts in Bangkok, the trip purpose cover weekday from Monday to Friday as a typical weekday. The study found that the daily trip purpose for work is highest with 86.2%, meanwhile 6.3% for education, 2.8% for shopping, and 4.7% for others. Correspondingly, the studies found that private mode (car and motorcycle) is the most pricey mode but a primary dominant use in all zones(Charoentrakulpeeti et al., 2006).

2.4. Coping Strategies

2.4.1. Travel Demand Management (TDM) to reduce traffic congestion.

Travel demand management (TDM) is an urban strategies approach to maximize public transportation systems' use, which is essential for sustainable development in the city. The goal of the TDM policy is to discourage the use of private vehicles and increase commuters in public transportation and non-motorized modes, which are environmentally friendly and reduce traffic congestion (Dinh Toan, 2019).

Singapore introduced its first "Road Pricing System" in 1975 to restrict inward commuting and congestion in the inner city through the Area Licensing Scheme (ALS). The systems require a car to register a permit license in order to commute in the restricted area. However, this is only beneficial for the rich people and effectively

controls the congestion in the restricted area only but causes congestion outside of the restricted area (Poon, 2016).

Therefore, the Electronic Road Pricing (ERP) system was introduced, which is an extension of the success of ALS implementation in 1998. The ERP system refined road pricing by improving automated cost reduction technology from vehicles and improved the error from the old system. Moreover, the ERP system increases driving costs during peak hours, which helps reduce the heavy commute on private mode during rush hours and encourages people to use public transportation mode (Poon, 2016).

In addition to this, Singapore is a small island country with land limitations. The Land Transport Authority (LTA) implemented a Vehicle Quota System (VQS) to help control car ownership and increase the healthy growth of the car population by involving a bidding process for certification of entitlement (COE) before being eligible to buy a car (Phang, 1993). Therefore, the integration of tax increases, annual renewal fees, and parking management results in an increase in the price of car vehicles and complications in the car ownership process. The inflated car taxes, high taxes on gasoline, parking fees, and road pricing make driving in Singapore less exciting and expensive. However, in return for decreasing the car demand, the government increases supply with the improvement of public transportation service to be more efficient (Dinh Toan et al., 2023).

Moreover, Singapore is also integrating land use and TOD development planning into its city and moving toward becoming a car-free city with the release of LTMP 2040, which follows the concept of a 15-minute, 20-minute, and 45-minute city. The concept of this city is to be well-connected with public transportation infrastructure, and urban facilities align with live, work, and play activities. Moreover, this development will encourage public transportation uses and promote non-motorized

mode, which is environmentally friendly and essential for a healthy lifestyle (Manifesty & Park, 2022).

2.5. Chapter Summary

From the literature review, several studies have revealed that socioeconomic & sociodemographic (age, gender, household income, household location, vehicle ownership), transportation characteristics (first & last mile, travel cost, travel time, and travel attitude), and trip characteristics (trip purpose) are the factors that influence the mode choice. Living in high-density areas have a higher access rate to mass transit than lower-density areas and suburban areas. It has been supported by the literature review that easy access to the mass transit station encourages a user to walk directly to the station and increases the probability of using public transportation mode. However, those who live farther from the mass transition choose private mode as a dominant mode.

The higher the household income, the higher the vehicle ownership present in the household. Consequently, the higher the number of car owners, the probability of choosing mass transit decreases. Research demonstrates that the primary dominant mode choice for a middle-class household is the private mode due to affordability among this household.

Differences in culture and social norms affect the mode choice for children, where Japanese parents allow their children to use public transportation and independently travel. On the other hand, a study from China revealed that parents tend to enroll their children in high-quality schools far from their residential zone to uplift their children's future and help them become successful. Thus, this causes worries among parents, encouraging them to chauffeur their children to school and increasing driving private mode to school. Meanwhile, it is also shown above that European parents have similar behavior toward their children's well-being and have concerns for their safety, are vulnerable to danger, and prefer to chauffeur them instead.

Meanwhile, the travel cost significantly influences the mode choice due to budget limitations and the availability of cheaper transportation options. *Public transportation* is an affordable mode that helps move people in large quantities in the city and reduces traffic problems.

Furthermore, both travel time and distance exert an influence on users' mode choices, considering factors such as travel duration, reliability, and time efficiency. The literature review reveals that the longer the travel time, the higher the probability of people choosing public transportation in Vietnam. Meanwhile, in Europe, an increase in distance between residential and work or school encourages users in a private mode instead.

Convenience, comfort, and reliability significantly impact the mode choice of university students, as demonstrated by a study conducted in Ho Chi Minh City. Students in this study preferred private modes over public buses due to their flexibility and reliability. However, when safety concerns arise, students prefer public bus transportation. Security and safety also raise concerns over European parents, which motivated them to chauffeur their children in a private mode due to unforeseen road accidents, stranger danger, and child molestation.

Travel demand management in Singapore, such as the Vehicle Quota System (VQS), Certification of Entitlement (COE), and Electronic Road Pricing (ERP), has been found to be a successful strategy for reducing traffic congestion in the city, controlling car ownership, and promoting commuting on public transportation.

In sum, from the literature review, these factors might only partially be influencing the mode choice in Thailand due to different cultures and urban structures, which opens

the possibilities of this research. There is a research gap from the literature review that no researcher points out whether the level of children's independence from their parents also influences their mode choice for school travel. Moreover, there is a relatively low study concentration on school trips in Bangkok's TOD area, which is a concerning issue as daily school trips heavily focus in Bangkok's center and contribute to traffic congestion. Therefore, this brought attention to this study for children traveling independently to a school around the mass transit stations. This research is a pilot project that may represent future research for a school with the exact location characteristics of the school mentioned above.

3. Chapter 3: Research Methodology

3.1. Research Overview

The purpose of this study aims to answering a paradox: why do student continue to reply on private car although their school located proximity to the mass transit station. The congestion around school area jamming to drop off and pick the student which significantly impact the area air quality and exacerbating environmental pollution. In addition, this research aims to understand what factors that influence the mode choice for school, trip frequency on the mass transit, and understand the perception of student toward using mass transit and how it is significantly impact to their daily life. Independence mobility for school trip is significantly important which promotes physical and mental well-being, reduces parental chauffeuring, reduces traffic congestion, and boosts children's confidence in public.

3.2. Research Design

This study will employ a mixed-method approach, combining qualitative and quantitative methods through a questionnaire survey. The qualitative aspect will explore students' perspectives on independent travel using mass transit. In contrast, the quantitative aspect will involve statistical regression analysis to examine the factors influencing mode choice and draw general conclusions regarding trip frequency on mass transit for independent travel.

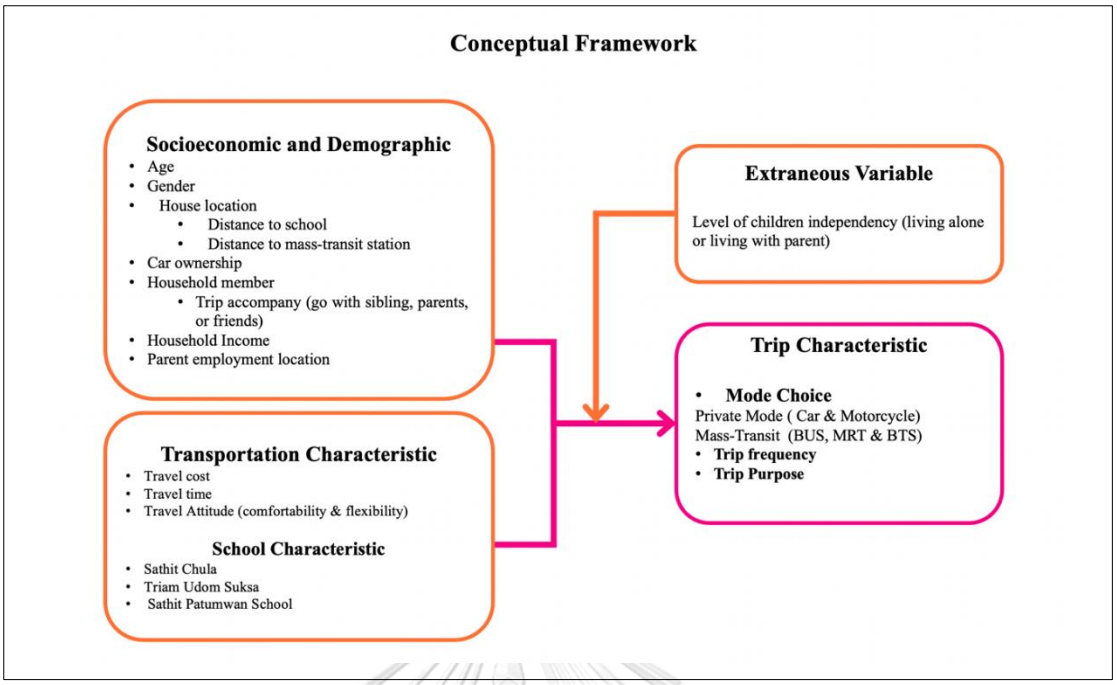


Figure 7. Conceptual Framework And Variables

As shown in **Figure 7**, the independent variables for this research encompass socioeconomic and sociodemographic factors that may impact high school students' mode choices at Sathit Chula, Triam Udom Suksa, and Sathit Patumwan School. The extraneous variable will test the hypothesis regarding the level of children's independence from their parents and its relationship to mode choice.

The dependent variables include travel mode choice, trip frequency, and trip purpose. Mode choice distinguishes between private modes (car and motorcycle) and mass transit modes (Bus; MRT; BTS). Understanding the frequency of using BTS and MRT is particularly important, given that these students have grown up with these systems. Additionally, the study will investigate whether students exclusively use private modes for school trips or utilize mass transit for other purposes. The level of children's independence will be measured based on whether they live alone or with their parents, including dependent students residing in Transit-Oriented Development (TOD) areas. This raises questions about factors preventing them from using mass transit for school trips.

3.3. Data Collection Method

This study will employ accidental sampling as the sampling method. The questionnaire will be distributed via the Google Forms platform using a QR code. The survey will be conducted in front of Sathit Chula, Triam Udom Suksa, and Sathit Patumwan School. Students will be asked to scan the QR code and access the Google Forms questionnaire, which consists of three parts:

1. General information, frequency of using mass transit and the Chula-pop bus, living arrangements, trip companions, and factors influencing mode choice evaluation.
2. Household distance, travel cost, travel attitude, perception of mode choice, and future car ownership.
3. A behavioral attitude evaluation.

The survey questionnaire contains multiple choice, a check box, a Likert scale, an input answer box, and a short paragraph answer. It is important to note that this survey will be conducted anonymously, without requiring students to provide their email or any personal identifying information. The data collected from participants will be treated as 100% confidential and contain no sensitive personal information about the students.

3.3.1. Measurement

Table 1. Characteristic of varables

Extraneous variable	Independent Variable	Dependent Variable
Level of children's independence • Living status with the parent • Part time job or making come	**Socioeconomic & demographic** • Age • Gender • House location • Distance to school • Distance to mass-transit station • Car ownership • Trip Accompany • Parent employment location	**Trip Characteristic** • Travel Mode Choice ❖ Private mode (car & motorcycle) ❖ Mass transit (Bus, BTS & MRT) • Trip Frequency • Trip Purpose
	Transportation Characteristic • Travel cost • Travel time • Travel attitude	
	School Characteristic • Sathit Chula • Sathit Patumwan • Triam Udom Suksa	

Table 1, Characteristic of Variables, outlines the measurement criteria for the extraneous variable (level of children's independence), including living status and income from part-time jobs. Independent variables (socioeconomic and demographic) encompass age, gender, house location, distance to school, distance to mass transit stations, car ownership, trip companions, and parents' employment location. Dependent variables (trip characteristics) include travel mode choice, trip frequency, and trip purpose.

3.3.2. Data collection procedure

The questionnaire will be distributed through Google Forms from August 2023 to September 2023, enabling electronic data calculation and reducing survey processing time. The survey will target high school students after school hours.

3.4. Sampling Strategy

Questionnaires will be administered at the school gate after 4:00 p.m. during non-school hours. Students will be encouraged to scan the QR code using their smartphones or tablets to input their responses. Additionally, students will be approached in various locations, including the cafeteria, Chulalongkorn Central Library, Chulalongkorn sports facilities, and the vicinity of Sathit Chula, Triam Udom Suksa, and Sathit Patumwan School. The survey may also be distributed through social media or shared by mutual friends who attend the same schools.

3.4.1. Unit of Analysis

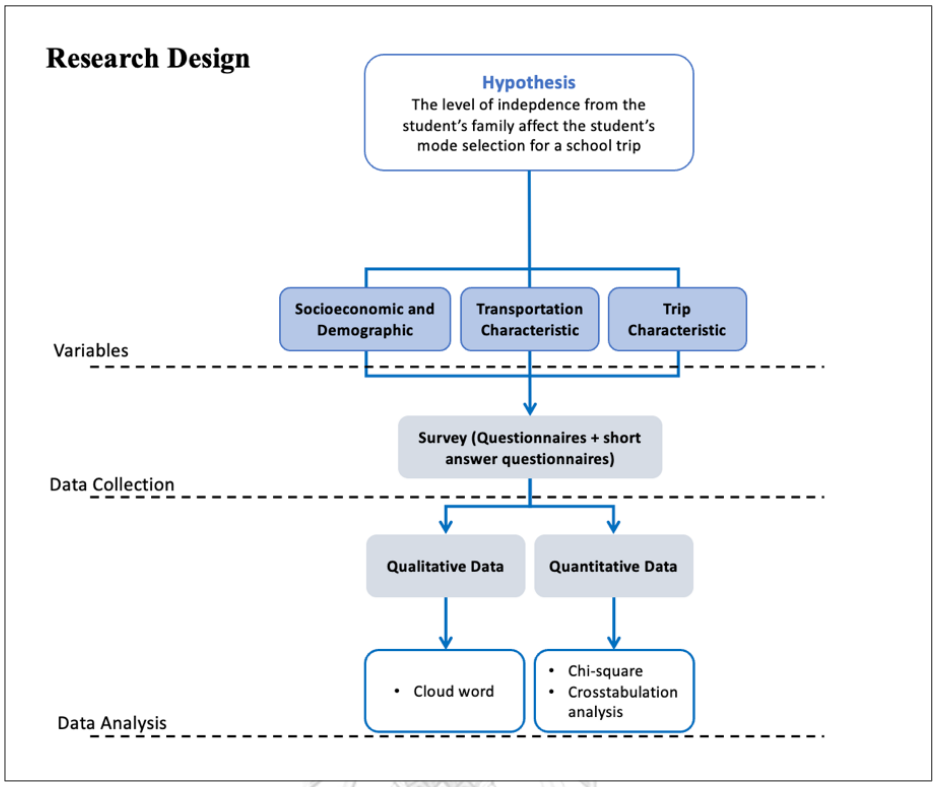


Figure 8. Research Framework

The unit of analysis for this research is a high school student. Participants must be enrolled at Sathit Chula, Triam Udom Suksa, or Sathit Patumwan School who are eligible to complete the questionnaire.

3.5. Data Analysis Method

Data analysis will categorize students into three groups to test the relationship between their independence level and mode choice for school trips. Students are categorized into three groups: (1) students with low independence level, (2) students with medium independence level, and (3) students with high independence level.

For this study, students were classified into three independent levels based on their living status, trip companionship, permission to use BTS/MRT, and ability to earn self-income. Living status and a student's ability to source self-income significantly determine a high level of independence. Therefore, it is believed that students who can

live independently are capable of making decisions independently, especially when they have their source of income.

Furthermore, the independence level for travel accompany is also significantly determined by students who go to school alone, without their parents. Additionally, parental permission to use mass transit to school plays a crucial role in determining the significant utilization of mass transit in TOD areas and the ability to travel independently.

In the first part of data analysis, inferential statistics will employ Chi-square to test for significant differences in mode choice among the four student groups. The null hypothesis posits no differences in mode choice among the groups, while the alternative hypothesis suggests that at least one group significantly differs from the others. Additionally, the study will test for differences in trip frequency on mass transit among the schools, examining whether school characteristics correlate with trip frequency.

Crosstabulation analysis will be employed to summarize percentages and reveal relationships between categorical variables and factors affecting mode choice, accounting for differences between the three schools at both individual and school levels.

In the second part of data analysis, a "word cloud" qualitative analysis method will be used to identify word frequency in survey responses, providing insights into why students do not use mass transit for school trips. In addition, employing cloud word using Pyhton help portray students' most frequently mentioned words from finding with visualization to understand the theme and data easily. This analysis will allow for comparisons between the three schools and evaluations of thematic differences at the school level.

3.6. The benefit of the study (Research Outcome)

The outcome of this study is to understand and identify the different groups of students and their travel mode choice for school trips. In addition, it provides an insightful detail of the factors that affect independent and dependent students' choice of mode. Therefore, an integration of essential urban strategies and policy proposal brings into this study to prioritize the use of mass transit to increase the student quality of life, reduce congestion in the area and increase the use of mass transit in the following generations. Moreover, this urban strategy and policy can apply and contribute to the school with the same characteristic next to mass transit in Bangkok.

4. Chapter 4: Research Findings

This section provides a general information finding of the students from Triam Udom Suksa, Chulalongkorn University Demonstration Secondary School (Sathit Chula), and Patumwan Demonstration School (Sathit Patumwan). In the following section of the findings, answering the research question and dive into the general socioeconomic characteristic of student household, the travel information of students and attitudes, factors affect their mode choice, and student's perception toward mode choice for school trip.

4.1. Socioeconomic and Sociodemographic Characteristics

This section presents an overview of general information regarding students' socioeconomic and sociodemographic characteristics across each school. The overview includes details about students' household characteristics, such as the household distance to mass transit, car ownership, monthly allowance, and living status. These factors may influence students' attitudes toward school travel.

The survey successfully reached the targeted number of participants, with 30 individuals sampled from each school. It is important to note that this study concentrates solely on the upper-secondary education level group. Therefore, the data

collected from students under the age of 15 is not included as they do not fall within the scope of this study.

The overall respondents from Sathit Chula, Sathit Patumwan, and Triam Udom Suksa comprised 48.8% males and 51.2% females. Students are divided into two groups, and based on the overall findings, 52.5% are in junior high school, while 47.5% are in senior high school (see **Table 2**). However, there is no difference in age among students. The youngest group is 15 years old, and the oldest group is 18 years old.

The monthly allowances provided by participants can be categorized into three groups: less than THB 8,000 (low), THB 8,000-13,000 (medium), and over THB 13,000 (high). Upon data breakdown, majority of participants (36.8%) received allowances in the range of THB 8,000-13,000 per month. Meanwhile, 31.6% received less than THB 8,000, and another 31.6% received more than THB 13,000 monthly. Furthermore, among school 55.6% of students from Sathit Chula received more than THB 13,000, 42.9% of those from Sathit Patumwan received less than THB 8,000, and 42.9% of students from Triam Udom Suksa received allowances ranging from THB 8,000-13,000 per month. It indicates that students from Sathit Chula receives highest allowance from their parents among others.

Furthermore, finding shows that only 8% of students, earned an income from teaching jobs and commissions from their parent's businesses. In contrast, the majority of students (49%) reported having no income. It implies that the majority of the students still financially rely on their parents. In corresponds, data further reveals that majority of student (85%) live with their parents as primary living arrangement and it is less common for student to with relatives, roommates, and siblings (see **Table 02**). Specifically, among students, Sathit living with parents the highest (93.1%), followed by Sathit Patumwan (81.0%), and lowest from Triam Udom Suksa (80.0%). Concisely, living with parents remains the most prevalent arrangement, showing no significant

differences among students. It highlights the potential role of parents influence in shaping student travel behavior and mode choice.

The characteristic of student' household location may exhibit the walkability distance and accessibility to the mass transit stations. It potentially emphasizes the availability of mass transit, influencing mode choice and travel behavior. These locations are categorized into Transit-Oriented Development (TOD) and Non-TOD, with TOD households within 1000 meters and non-TOD households beyond 1000 meters from mass transit stations.

Table 2 illustrates that 56.3% of participants live in TOD household and 43.8% live in a non-TOD household, whereas 28.7% live less than 500 meters from mass transit stations, and 27.5% live within 500-1000 meters. Sathit Chula has highest percentage (31%) live within 500 meters, and another (31%) live between 500-1000 meters away from mass transit stations. In comparison, 23.8 % of Sathit Patumwan students reside within 500 meters and 38.1% lives between 500-1000 meters. Moreover, 30% of Triam Udom Suksa residing within 500 meters, with an additional 16.7% lives between 500-1000 meters. Particularly, Sathit Patumwan shared a similarity household distance with Triam Udom Suksa, while Sathit Chula has the highest percentage among students to live in the TOD.

Furthermore, the availability of the car ownership within the household may shapes commuting mode preference and travel behavior. The findings reveal that, there are no participants from these school have no cars in their household which 77.0% of them owns 1-2 cars. Sathit Chula has the highest car ownership, with 83.3% having 1-2 cars, 20.7% having 3 cars, and 13.8% having 4 cars or more. In addition, 83.3% of Sathit Patumwan students own 1-2 cars, 6.7% own 3 cars, and 10.0% own 4 cars or more. Triam Udom Suksa students 82.1% own 1-2 cars, 17.9% own 2 cars, and none own 4 cars. Despite residing near to the mass transit stations, the high presence of car ownership in these households suggest that this may a potential influence on a high reliance on private modes and low utilization of mass transit.

In sum, Sathit Chula and Sathit Patumwan share some similarities, while Triam Udom Suksa shows a distinctive characteristic with higher rate of students living in non-TOD. Despite these differences, there is no notable distinctions in characteristics among these three schools, with the majority (56.3%) of students living in the TOD household and 77% own 1-2 cars in their household. It indicates that these students predominantly come from middle-class household. Interestingly, the high presence of car ownership in the household may affect to the trip characteristic of the students. Therefore, in the following section will provide an exploration of trip characteristic among three schools.

Table 2. Socioeconomic and Sociodemographic Characteristics

		School						Total	
		Sathit Chula		Sathit Patumwan		Triam Udom Suksa			
		N	%	N	%	N	%	N	%
Gender	Male	12	41.4%	12	57.1%	15	50.0%	39	48.8%
	Female	17	58.6%	9	42.9%	15	50.0%	41	51.2%
Total		29	100.0%	21	100.0%	30	100.0%	80	100.0%
Student Group	Junior High School	18	62.1%	14	66.7%	10	33.3%	42	52.5%
	Senior High School	11	37.9%	7	33.3%	20	66.7%	38	47.5%
Total		29	100.0%	21	100.0%	30	100.0%	80	100.0%
Living Status	Parents	27	93.1%	17	81.0%	24	80.0%	68	85.0%
	Relatives	1	3.4%	2	9.5%	1	3.3%	4	5.0%
	Roommate	0	0.0%	1	4.8%	1	3.3%	2	2.5%
	Siblings	1	3.4%	0	0.0%	0	0.0%	1	1.3%

	Alone	0	0.0%	1	4.8%	4	13.3%	5	6.3%
Total		29	100.0%	21	100.0%	30	100.0%	80	100.0%
Average Monthly Allowance	THB < 8,000	4	14.8%	9	42.9%	11	39.3%	24	31.6%
	THB 8,000-13,000	8	29.6%	8	38.1%	12	42.9%	28	36.8%
	THB > 13,000	15	55.6%	4	19.0%	5	17.9%	24	31.6%
Total		27	100.0%	21	100.0%	28	100.0%	76	100.0%
Student Self-income	Have self-income	0	0%	3	14%	3	10%	6	8%
	No self-income	9	31%	13	62%	17	57%	39	49%
	Rather not say	20	69%	5	24%	10	33%	35	44%
Total		29	100%	21	100%	30	100%	80	100%
Car Ownership in Household	None	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	1-2 Cars	19	65.5%	25	83.3%	23	82.1%	67	77.0%
	3 Cars	6	20.7%	2	6.7%	5	17.9%	13	14.9%
	4 or more	4	13.8%	3	10.0%	0	0.0%	7	8.0%
Total		29	100.0%	30	100.0%	28	100.0%	87	100.0%
Household characteristics	TOD household	18	62.1%	13	61.9%	14	46.7%	45	56.3%
	Non-TOD household	11	37.9%	8	38.1%	16	53.3%	35	43.8%
Total		29	100.0%	21	100.0%	30	100.0%	80	100.0%
Household distance to BTS/MRT stations	less than 500m	9	31.0%	5	23.8%	9	30.0%	23	28.7%
	500m-1000m	9	31.0%	8	38.1%	5	16.7%	22	27.5%
	1km-10km	7	24.1%	8	38.1%	10	33.3%	25	31.3%
	more than 10km	4	13.8%	0	0.0%	6	20.0%	10	12.5%

Total	29	100.0%	21	100.0%	30	100.0%	80	100.0%

4.2. Trip Characteristics

This section delves into general travel information for students across these schools, covering monthly travel costs, trip companionship, mode choice, and trip frequency on mass transit. The data reveals mode choices and emphasizes the significance of comprehending socioeconomic factors that impact students' traveling patterns.

The highest travel mode selected mode by student is BTS and MRT with overall rate of 47.5%. In addition, car mode is second highest mode selected by 43.8% of student, nearly as much as BTS and MRT mode. However, other mode is less favorable among these students with 3.3% choosing motorcycle, 2.2% selecting bus, 1.1% selecting paratransit, and 1.1% preferring walking (see **Table 3**).

Specifically, the majority (72.4%) of Sathit Chula travel on car mode, which marking the highest rate among students. In contrast, only 38.1% of Sathit Patumwan and 20% of Triam Udom Suksa commuting on car mode. On the other hand, Triam Udom Suksa has the highest rate of using BTS and MRT, with 73.3%, followed by Sathit Patumwan 57.1% and lowest Sathit Chula with 13.8%. Thus, it indicates that the high car ownership in household may affecting student's mode choice. Furthermore, in following section will explore the frequency of students' utilization of BTS and MRT services. This exploration helps to identify which students use mass transit as primary mode and to understand which factor that potentially affect to travel frequency on mass transit.

The overview data reveals that 42.5% students spend less than one time in a week on mass transit, while 12.5% students use BTS/MRT 3-5 times a week, and 35% use BTS/MRT every day. The majority (72.4%) of Sathit Chula has the lowest trip

frequency on mass transit among students, following by 33.3% of Sathit Patumwan, and 20% of Triam Udom Suksa. Furthermore, 6.9% of Sathit Chula, 14.3% of Sathit Patumwan, and 16.7% of Triam Suksa students traveling on mass transit 3-5 times a week. On the other hand, 56.7% of Triam Udom Suksa students and 42.9% of Sathit Patumwan travel every day on mass transit.

Consequently, the overview of the monthly expense from student on travel fee is low which may an explanatory the low travel frequency on mass transit. The majority of participants (47.5%) spend less than 500 THB, while a minority 5% spends 3000-4000 THB on average for monthly travel fees. Most of Sathit Patumwan (33.3%) and Triam Udom Suksa (30%) spend on travel fee 1500-3000 THB monthly, marking the highest rate among students. In comparison, Sathit Chula (69%) and a portion of Sathit Patumwan (47.6%) spend less than 500 THB monthly on travel fees. It indicates that students spend the least on travel fee are highly reliance on car mode and those spend high on travel fee tends to use mass transit of BTS and MRT, frequently.

Upon examination, trip accompany characteristic offer an insight view on with 43.8% of the student go to school by themselves, and 41.3% with their parents. It is very uncommon for students to travel to school with their relatives (2.4%), siblings(7.5%), roommates, or neighbors (5%). The majority of Sathit Chula student (65.5%) go to school with their parents and only 20.7% travel alone (see **Table 3**). In addition, 33.3% of Sathit Patumwan go to school with their parents, 9.5% with their siblings, and 52.4% alone. In contrast, only 23.3% of Triam Udom Suksa travel to school with their parents, and 60.0% travel alone. In sum, Sathit Chula students have the highest percentage of traveling to school with their parents, while the majority of Sathit Patumwan and Triam Udom Suksa students travel to school alone.

According to **Table 3**, 69% of the student are allowed, and 31% are not allowed to take mass transit. Sathit Patumwan (86%) and Triam Udom Suksa (83%) students are

allowed to take mass transit the highest, with nearly identical results. Meanwhile, almost half of Sathit Chula students is allowed to take mass transit 41%, and 59% are not allowed to take mass transit.

Base on the information regarding students' travel frequencies and permission to take mass transit, it demonstrates that Triam Udom Suksa and Sathit Patumwan school has higher travel frequencies on the mass transit compared to Sathit Chula. The difference may influence by higher permission students receive from their parents to travel on mass transit. In summary, Sathit Patumwan and Triam Udom Suksa shared a similar trip characteristic including a preference for mass transit, high trip frequency on mass transit, high monthly travel fees, and traveling alone. On the other hand, Sathit Chula students are high reliance on car mode, low trip frequency on mass transit, spend low on travel cost, and traveling with parents.

Table 3. Travel Information of Respondents

		School						Total	
		Sathit Chula		Sathit Patumwan		Triam Udom Suksa			
		N	%	N	%	N	%	N	%
Mode Choice	Car	21	72.4%	8	38.1%	6	20.0%	35	43.8%
	Motorcycle	3	10.3%	0	0.0%	0	0.0%	3	3.8%
	BTS/MRT	4	13.8%	12	57.1%	22	73.3%	38	47.5%
	Bus	0	0.0%	1	4.8%	1	3.3%	2	2.5%
	Walk	0	0.0%	0	0.0%	1	3.3%	1	1.3%
	Paratransit	1	3.4%	0	0.0%	0	0.0%	1	1.3%
Total		29	100.0%	21	100.0%	30	100.0%	80	100.0%
	THB 0-500	20	69.0%	10	47.6%	8	26.7%	38	47.5%

	THB 500-1500	8	27.6%	4	19.0%	10	33.3%	22	27.5%
Average Travel Cost Monthly	THB 1500-3000	0	0.0%	7	33.3%	9	30.0%	16	20.0%
	THB 3000-4000	1	3.4%	0	0.0%	3	10.0%	4	5.0%
Total		29	100.0%	21	100.0%	30	100.0%	80	100.0%
Travel Frequencies on BTS/MRT	less than 1 time	21	72.4%	7	33.3%	6	20.0%	34	42.5%
	1-3 times/week	4	13.8%	2	9.5%	2	6.7%	8	10.0%
	3-5 times/week	2	6.9%	3	14.3%	5	16.7%	10	12.5%
	Everyday	2	6.9%	9	42.9%	17	56.7%	28	35.0%
Total		29	100.0%	21	100.0%	30	100.0%	80	100.0%
Trip Accompany	Parents	19	65.5%	7	33.3%	7	23.3%	33	41.3%
	Relative/Personal Driver	2	6.9%	0	0.0%	0	0.0%	2	2.4%
	Siblings	2	6.9%	2	9.5%	2	6.7%	6	7.5%
	Roommate/ Neighbors	0	0.0%	1	4.8%	3	10.0%	4	5.0%
	Alone	6	20.7%	11	52.4%	18	60.0%	35	43.8%
Total		29	100.0%	21	100.0%	30	100.0%	80	100.0%
Permission to take BTS/MRT	Allow	12	41%	18	86%	25	83%	55	69%
	Not allow	17	59%	3	14%	5	17%	25	31%
Total		29	100%	21	100%	30	100%	80	100%

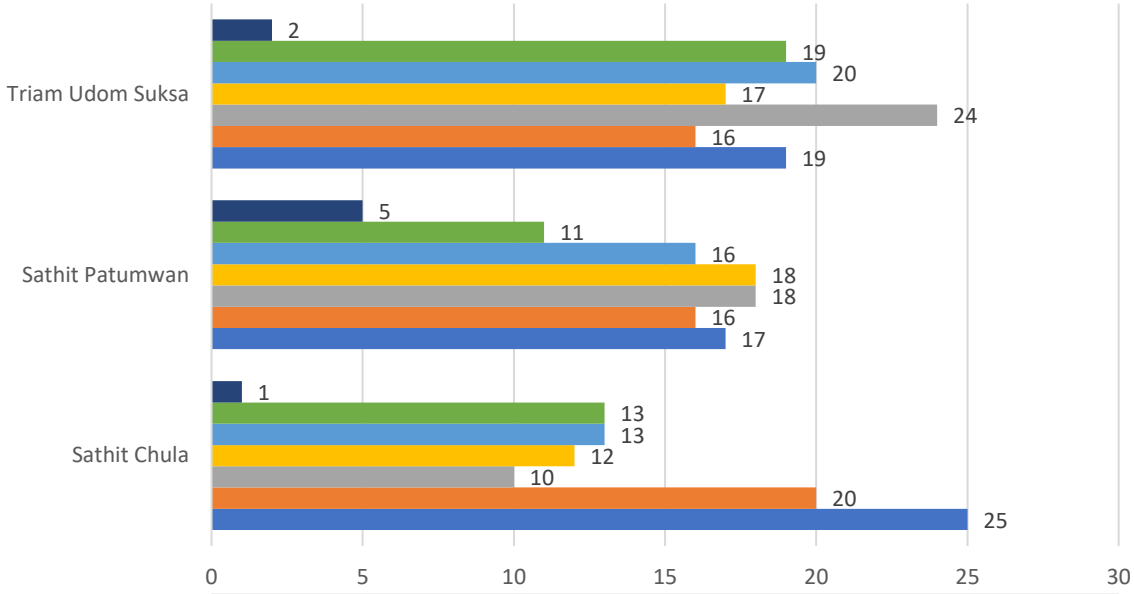
4.3. Factors affect to Mode Choice and Attitudes

Among the factors influencing mode choice, safety, travel cost, and parental permission emerge as crucial factors affecting students' mode choices. A significant 76% of the respondents ranked safety as the highest dominant factor for their travel,

with an average of 0.76 and a standard deviation of 0.428, indicating its considerable importance to students (see **Table 4**). Additionally, 65% of the participants ranked both parental permission and travel cost as factors affecting their mode choice, with an average of 0.65 and a standard deviation of 0.48. Therefore, the overview of the findings shows that students consider safety, travel cost, and parental permission as the most significant factors influencing their mode choices for school travel. The following section will explore in-depth descriptive analysis among school.

Table 4. Factors Affect Mode Choice

	N	Count	Mean	Sd. Deviation
Safety	80	61 (76%)	0.76	0.428
Travel cost	80	52 (65%)	0.65	0.480
Permission from parents	80	52 (65%)	0.65	0.480
Accessibility	80	49 (61%)	0.61	0.490
Reliability	80	47 (59%)	0.59	0.495
Travel Time	80	43 (54%)	0.54	0.502
No Shuttle Bus	80	8 (10%)	0.11	0.318



	Sathit Chula	Sathit Patumwan	Triam Udom Suksa
No Shuttle Bus	1	5	2
Travel Time	13	11	19
Accessibility	13	16	20
Reliability	12	18	17
Travel cost	10	18	24
Permission from parents	20	16	16
Safety	25	17	19

Figure 9. Factors Affect to Mode Choice Among School

4.3.1. Safety Affect to Student's Mode Choice

Upon analyzing safety as a factor influencing students' mode choices reveals differences across schools. Sathit Chula students who predominantly reliance on car mode, prioritize safety with 25 out of 29, emphasizing car as safest mode choice (see **Figure 9**). Meanwhile, Sathit Patumwan scores 17 out of 21, echoing a diverse perception of safety among mode. In contrast, Triam Udom Suksa scores the lowest on safety factor with 19 out of 30, indicating students' relative inexperience with safety considerations and may suggesting a high level of trust in the security system of mass transit.

- **Student Attitudes Toward Safety and Security**

Examining students' attitudes towards traveling on mass transit, the majority express confidence, with 35% strongly agreeing and 27.5% agreeing that it is safe to travel alone. This emphasizing the significance of these students' confidence in Bangkok's mass transit security system. On the other hand, there is a contrast emerge among students 17.5% express strongly agree and 16.3% agree that they do not feel safe outside of the mass transit station. In contrast, 41% of students remain neutral about safety around BTS and MRT stations.

Breaking down the analysis, a majority of Sathit Patumwan (52.4%) and Triam Udom Suksa (40%) express strongly agree, emphasizing they feel safe and secure to travel alone on mass transit. It may explain the preference and high utilization on mass transit among students. In contrast, 34.5% of Sathit Chula students strongly disagree, potentially explains their high reliance on mass transit and low utilization of mass transit (see **Table 5**).

On the contrary, **Table 6** illustrate students' attitudes toward safety and security outside of mass transit. The majority of Triam Udom Suksa (56.7%) and Sathit Patumwan (38.1%) express neutral attitude, reflecting that these students may have mixed perceptions or feel normal with the environment around mass transit, lacking negative experiences that would make them feel unsafe. However, Sathit Chula students express that they do not feel safe outside of mass transit, with 27% strongly agree and 23% agree, emphasizing their high reliance on car mode.

Table 5. I feel safe and secure taking the BTS and MRT alone.

	School						Total	
	Sathit Chula		Sathit Patumwan		Triam Udom Suksa			
	N	%	N	%	N	%	N	%

Strongly Agree	5	17.2%	11	52.4%	12	40.0%	28	35.0%
Agree	5	17.2%	7	33.3%	10	33.3%	22	27.5%
Neutral	5	17.2%	1	4.8%	6	20.0%	12	15.0%
Disagree	4	13.8%	0	0.0%	1	3.3%	5	6.3%
Strongly Disagree	10	34.5%	2	9.5%	1	3.3%	13	16.3%
Total	29	100.0%	21	100.0%	30	100.0%	80	100.0%

Table 6. I don't feel safe outside the BTS and MRT stations.

	School						Total	
	Sathit Chula		Sathit Patumwan		Triam Udom Suksa			
	N	%	N	%	N	%	N	%
Strongly Agree	8	27.6%	3	14.3%	3	10.0%	14	17.5%
Agree	6	20.7%	4	19.0%	3	10.0%	13	16.3%
Neutral	8	27.6%	8	38.1%	17	56.7%	33	41.3%
Disagree	6	20.7%	6	28.6%	5	16.7%	17	21.3%
Strongly Disagree	1	3.4%	0	0.0%	2	6.7%	3	3.8%
Total	29	100.0%	21	100.0%	30	100.0%	80	100.0%

These findings from Sathit Patumwan and Triam Udom Suksa students significantly indicate positive behavior toward the safety and security mass transit. However, a group of Sathit Chula students expressed disagreement, suggesting that there may be room for improvement in enhancing mass transit security to facilitate a diverse range of students who may be affected by safety concerns.

The next section delves into the influence of travel costs on students' mode choice, addressing concerns, and attitudes. The role of travel costs is crucial shaping student's mode choice and shed light on transportation strategies to optimizing and enhancing the affordability of mass transit use.

4.3.2. Travel Cost Affect to Student's Mode Choice

Triam Udom Suksa students ranking travel cost as highest factor affect to their mode choice with a score of 24 out of 30, following by Sathit Patumwan with a score 18 out of 21. In contrast, Sathit Chula students score the lowest among students with 10 out of 29 (see **Figure 9**). It indicates that Sathit Chula do not affect by travel cost may be due to a unique financial perspective and high reliance on car mode.

The comparison of student monthly allowance and travel monthly expense may provide an explanation. Despite receiving a high allowance from their parents' students spent very little on their travel fees. For instance, 55.6% of Sathit Chula students received more than 13,000 THB allowance, but 69% spent less than 500 THB on travel costs monthly. In addition, 42.9% of Sathit Patumwan students received less than 8000 THB per month, and 47.6% spent less than 500 THB on travel costs monthly. Meanwhile, 42.9% of Triam Udom Suksa students received 8000-15000 THB monthly, but 33.3% spent 500-1500 THB on travel costs.

The inconsistency between students' allowances and travel expenses may be due to the high travel costs of mass transit. Students may want to spend their monthly allowance on personal expenses rather than traveling. This indicates that students who spend less on travel fees use the BTS and MRT systems less frequently and depend more on private transportation.

The following section explores students' attitudes toward travel fare fees to evaluate whether travel cost affect their frequency utilizing mass transit of BTS and MRT.

- **Student's Attitude on Travel Fees**

Examining students' attitudes towards traveling fees, the majority (56.3%) strongly if travel fees is lower, they will use mass transit to school more often. It reflects a high concerns attitude over the travel cost on mass transit, which explains their low trip frequency on mass transit.

Among students, the majority (80%) of Triam Udom Suksa and (71.4%) of Sathit Patumwan strongly agree with the statement (see **Table 7**). It indicates high concern

about travel costs, which may an explain why some students from these school who has low travel frequency on mass transit. It highlights that the mass transit system in Bangkok is still expensive and not affordable among these students who still financially supported by their parents. In contrast, 24.1% of Sathit Chula strongly disagree and 31% disagree, exhibits no concerns about travel costs. It indicates these students do not concern over travel cost possibly due to high monthly allowance they receive from their parents and their heavy reliance on car mode.

Table 7. If the travel fee is lower, you will use mass transit BTS/MRT to school more often

	School						Total	
	Sathit Chula		Sathit Patumwan		Triam Udom Suksa			
	N	%	N	%	N	%	N	%
Strongly Agree	6	20.7%	15	71.4%	24	80.0%	45	56.3%
Agree	1	3.4%	2	9.5%	2	6.7%	5	6.3%
Neutral	6	20.7%	2	9.5%	1	3.3%	9	11.3%
Disagree	9	31.0%	2	9.5%	2	6.7%	13	16.3%
Strongly Disagree	7	24.1%	0	0.0%	1	3.3%	8	10.0%
Total	29	100.0%	21	100.0%	30	100.0%	80	100.0%

Findings reveal that these students are financially supported by their parents; therefore, parental permission is considering a crucial factor that shape and influences students' travel mode to school. Subsequently, the study examines parental permission among student and provides insights into students' attitudes whether they have desire to travel more frequently if their parent allows them.

4.3.3. Permission from Parents to Take Mass Transit

Table 4 reveals that 65% of students rank permission from their parents as the third highest factor affect to their mode choice. Sathit Chula scored 20 out of 29, making this

group the most highly affected by their parents' permission toward their travel mode choice. In contrast, Triam Udom Suksa scored 16 out of 30 and Sathit Patumwan scored 16 out of 21 (see **Figure 9**), suggesting that half of this group's participants are not highly affected by their parent's permission and are capable of making their own decision for school travel. The following section explores students' attitudes toward traveling independently on mass transit to school if their parents allow them to.

- **Student's Attitude on Permission on Mass Transit**

The 36.3% strongly agree, 8.8% agree, 28% remain neutral while, 18% disagreed, and 10% strongly disagree with the statement "You want to travel on mass transit (BTS/MRT) everyday if your parents allow you" (see **Table 8**). It indicates, students who agree with statement have a high desire to travel by mass transit to school, conversely students who disagree are less desire to travel by themselves. In addition, 28% of students remain neutral may be a regular user traveling daily on mass transit to school.

Among students, 53.3% of Triam Udom Suksa and 38.1% of Sathit Patumwan students strongly agree, illustrates that their enthusiastic to travel more frequent on mass transit. However, those of 26.7% of Triam Udom Suksa and 33.3% of Sathit Patumwan students show a neutral attitude, may suggest that due to the fact that they are already using mass transit to school every day and may not need permission from their parents. Conversely, Sathit Chula incline toward disagreement with 34.5% and 20.7% strongly disagree (see **Table 8**). Implies these students comfortable with their current travel mode and have no desire to shift mode to mass transit.

Parental permission is identified as one of the critical and influential factors in student's independent travel to school. Therefore, the next section explores the reasons behind why they are allowed to use mass transit for school commuting, and why they are not. This investigation aims to uncover what worries parents and to understand the reasons behind the continued use of car mode for commuting to school. Thus, in the

survey, students were asked to provide a short answer to the question "Do your parents allow you to take mass transit (BTS/MRT) to come to school? Why?"

Table 8. You want to travel on mass transit (BTS/MRT) everyday if your parents allow you.

	School						Total	
	Sathit Chula		Sathit Patumwan		Triam Udom Suksa			
	N	%	N	%	N	%	N	%
Strongly Agree	5	17.2%	8	38.1%	16	53.3%	29	36.3%
Agree	2	6.9%	3	14.3%	2	6.7%	7	8.8%
Neutral	6	20.7%	7	33.3%	8	26.7%	21	26.3%
Disagree	10	34.5%	3	14.3%	1	3.3%	14	17.5%
Strongly Disagree	6	20.7%	0	0.0%	3	10.0%	9	11.3%
Total	29	100.0%	21	100.0%	30	100.0%	80	100.0%

4.3.4. Understanding Parental Perspective: Consent on Mass Transit for School Commuting

According to Table 3, 69% of the respondents were allowed and 31 not allowed to take BTS/MRT. Among students, Sathit Patumwan (86%) and Triam Udom Suksa (83%) are allow to take mass transit. Meanwhile, almost half of Sathit Chula students (41%), are allow and 59% are not allowed to take mass transit.

Figure 10, illustrates that most mentioned words by students are safety, convenience, reliability, necessity, same destination to parent's workplace, travel time, cost and affordability, accessibility distance, trust in child's independence, and situational base. Hence, these mentioned factors are grouping into theme to distinguish between group of students who were allowed and not allowed to be on mass transit by their parents. The primary themes comprise safety, convenience, reliability, and trust in

a child's independence. Indeed, parental permission, repeatedly mentioned in respondents' answers, is evidently the most influential factor in shaping children's traveling attitudes and their frequency of using BTS/MRT.

Figure 10. Word Cloud for "Do your parents allow you to take mass transit BTS/MRT to come to school? Why?"

Table 9. Theme of Factors Affect to Student's Permission to Take BTS/MRT

Theme	Yes			No		
	N	Count	%	N	Count	%
Safety	54	9	17%	26	10	38%
Convenience & Reliability	54	14	26%	26	0	0%
Necessarily	54	5	9%	26	0	0%
Same Destination to Parents Work's Place	54	0	0%	26	5	19%
Travel Time	54	11	20%	26	0	0%
Cost and Affordability	54	4	7%	26	1	4%
Distance and Accessibility	54	5	9%	26	3	12%

Trust in Child's Independence	54	10	19%	26	0	0%
Situational Base	54	10	19%	26	0	0%

Students who are allowed to use mass transit: 26% recognize reliability and convenience as a green light to their permission to utilize BTS and MRT system to school. Student commonly mentions “I’m allowed, because fast and convenience (SC24, 2023)” and “I’m allowed, because it's fast and convenience (TUS27, 2023).” Furthermore, on top of convivence and reliability, parents trusted in the safety provide by mass transit, which students mention “I’m allowed, because safe and convenience (SC3, 2023)”and “I’m allowed because it’s convenient and safe (SP15, 2023)” (see **Appendix A**).

Additionally, another 20% got permission due to time efficiency provided by the high-speed overpass and underground system, and 7% necessity for using to travel (see **Table 12**). Student commonly mentions, “I’m allowed, because convenience, safe and punctual (TUS13, 2023).” Moreover, 19% of student are allow based on situation factor, saying “I’m allowed depending on the day (SC1, 2023)” and "I’m allowed when my parents are not too busy to chauffeur" (SC7, 2023)” (see **Appendix A**). It reflects the dynamic of the flexibility and adaptability in students' commuting permissions based on changing circumstances. In addition, it may also explain the cause affect to travel frequency on mass transit.

Furthermore, 19% of students got permission to use a mass transit because their parents trust in their children’s independence and ability to travel alone (see **Table 12**). Students express in the survey, sayings “I’m allow, because I reach the age that capable to take care of myself (SC4, 2023)”, “I’m allowed, because I'm old enough to go to school by myself (SP1, 2023)” and “I’m allowed, because I'm growing up now and can travel myself (SP2, 2023).” Additionally, these parents want them to grow a sense of self-reliance and able to navigate life on their own, mentions “I’m allow, because parents want me learn to live independent life (SP14, 2023)” and “I’m allow, because

my parent want me to be independent as I grow up (SP21, 2023)" (see **Appendix A**). These findings paint a picture on independence aspect they receive from parents, shapes students' travel patterns.

Students who are not allowed to use mass transit: 38% of students affected by safety concerns from their parents, such as anxieties about strangers, crowds, and safety issues. On top of this limit access to mass transit and same destination with their parents' workplace are commonly influence these students to commuting to school in car mode. Students whose affect by the safety factors, sayings "I'm not allowed, because of safety (SP12; SP19 & SP20, 2023)" and "I'm not allowed, because station far from house and BTS/MRT has a lot of people (SC26, 2023)" (see **Appendix A**).

In sum, these factors highlight the reasons affecting students' permission on mass transit and keep traveling in car mode due to safety concerns, such as anxieties about strangers, crowds, limited access to transit, and same destination as their parents' workplace. Conversely, students who allow to commute in mass transit due to their parents' trust in student independence, safety, convenience, reliability, travel time, and situation base. Hence, this reason portrays a high influence of independence level from student's family shaping their travel pattern.

4.3.5. The Levels of Independency from Family and Mode Choice

It is evidently show above that parents have high influential on student's mode choice for school trip. Therefore, this lead to this study hypothesis: the level of independence from the student's family affects the student's mode selection for a school trip. It is believed that student with higher independence levels are likely to travel in mass transit mode, and those with low independence levels are highly reliant on car mode with their parents.

Students were categorized and grouped into three independent levels based on their living status, trip accompany, permission to take BTS/MRT, and ability to earn self-income. In addition, a student's permission to use mass transit also plays a significant role in determining their independence. According to the findings in **Table 3**, students from Sathit Patumwan and Triam Udom Suksa have the highest rate of students allowed to travel on mass transit at 76.6%.

Living arrangements for these groups of students might not highly affect their independence levels since the majority of the students are living with their parents. Nevertheless, students' trip accompanies can score for the level of independence in this study. Referring to **Table 3**, nearly half of the students go to school with their parents (41.1%), and 42.2% travel alone. This finding shows that it is uncommon for students to go to school with their siblings (10.0%), roommates (4.4%), and relatives (2.2%). Therefore, students who travel to school alone scored higher in terms of independence than those who travel to school with their parents.

Henceforth, based on the information provided by the respondents, these findings categorize students' levels of independence into three categories: high, medium, and low levels of independence.

According to the **Table 13**, a cross-tabulation table between independence level of student and a mode choice reveals that the highest mode favored by the low independency group is "Car," with 36.7% out of 41.1%. In contrast, students with medium independence level favor "BTS/MRT" mode as the highest with 10%, followed by "Car" mode at 6.7% out of 16.7%. Those with high independence levels chose "BTS/MRT" as their dominant preferred mode choice with 35.6% out of 42.2%, with the lowest 2.2% for "Car" mode. Overall, out of 90 participants, 46.7% chose "BTS/MRT," and 45.6% chose a car, which is not much different from each other. In

comparison, other modes, such as motorcycle (3.3%), bus (2.2%), walking (1.1%), and paratransit (1.1%), were less commonly chosen.

The statistical analysis shown in **Table 14** indicates there is a strong correlation between the independence level and the mode selection for school trips. The Pearson Chi-square value is 60.651 with df 10 and the p-value less than 0.001, showing high statistical significance. The likelihood ratio value is 76.391 with df 10 and the p-value less than 0.001, implying that there is a highly significant linear relationship. The linear-by-linear association value is 49.202 with df 1, and the p-value was less than 0.001, indicating a strong linear relationship between the variables. This suggests that the relationship is not a result of chance and there is a noticeable trend or gradient present. Therefore, the null hypothesis can be confidently rejected: the level of independence from the student's family does affect the student's mode choice.

Table 10. Independence Level * Mode Choice Crosstabulation

Independency Level		Mode Choice						Total
		Car	Motorcycle	BTS/MRT	Bus	Walk	Paratransit	
Low Independency	Count	33 (36.7%)	2 (2.2%)	1 (1.1%)	1 (1.1%)	0 (0.0%)	0 (0.0%)	37 (41.1%)
Med Independency	Count	6 (6.7%)	0 (0.0%)	9 (10.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	15 (16.7%)
High Independency	Count	2 (2.2%)	1 (1.1%)	32 (35.6%)	1 (1.1%)	1 (1.1%)	1 (1.1%)	38 (42.2%)
Total		41 (45.6%)	3 (3.3%)	42 (46.7%)	2 (2.2%)	1 (1.1%)	1 (1.1%)	90 (100.0%)

Table 11. Chi-square test chart

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	60.651[a]	10	<.001

Likelihood Ratio	76.391	10	<.001
Linear-by-Linear Association	49.202	1	<.001
N of Valid Cases	90		

a. 12 cells (66.7%) have expected count less than 5. The minimum expected count is .17.

4.4. Student's Perception on Mode Choice

Students were asked to explain how the traveling mode choice affects their daily lives, to explore their perception of mode choice, and whether they perceive it as having a positive or negative impact on their daily lives. This section delves into the crucial aspect of children's perception of traveling mode choices for school trip that potentially can influence their mode choice in the adulthood. Hence, in the last part of this section, students were asked whether they wanted to buy a car in the future to gain an insight into the perspective of individuals on car ownership and their desire to own a car in the future.

4.4.1. Student's Perception on Travel Mode Choice Impact on Daily Life

Figure 11. Word Cloud for "In your opinion, how do you think your mode of transportation impacts your daily life, studies, social skills, and overall well-being?

Table 12. Mode of transportation impacts on daily life

	School						Total	
	Sathit Chula		Sathit Patumwan		Triam Udom Suksa			
	N	%	N	%	N	%	N	%
Impacts	14	48%	18	86%	20	67%	52	65%
Not impacts	5	17%	0	0%	1	3%	6	8%
Rather not say	10	34%	3	14%	9	30%	22	28%
Total	29	97%	21	70%	30	100%	80	100%

According to **Table 12**, 65% of student agreed that their traveling method impacts their daily lives, 8% said no impact, and 28% preferred not to express their opinions. **Figure 11** portrays diverse perception perceived by student includes efficiency, time-management, convenience, long trave, time wasted, congestion, and productivity. Since common mode commute to school by student is car and mass transit (BTS/MRT), the following section categorized into two parts: students who are impacts by mass transit mode, and those impacts by car mode for school trip. This study aims to shed light on their perception of how transportation modes for school traveling impact their daily well-being and significantly contributes to their education. It also helps this study gain insight into students' awareness of the positive and negative impacts of their chosen transportation modes.

Student's perception impacted by using mass transit: Students expressed an overwhelming positive impacts on their daily life, such as being punctual to school and appointment, arriving on time, and greatly affecting time efficiency. Moreover, it effectively impacts their time management, allowing them to accomplish more task in daily life In addition, students mentioning that using mass transit increases their social skill and productivity through bonding time (hangout & extracurricular activity) after school and going back home together (see **Appendix B**). Student's statements highlight

the significant of using mass transit for school travel, including punctuality, time efficiency, time management, increase productivity and enhancing social skills.

On the other hands, some students mention traveling on mass transit gives them exhaustion and fatigue at the end of the day due to their endure to long periods of standing and extra walking distance from station to home. Hence, traveling on mass transit may impact to some students with less strong physical builds, which can be unpleasant and give them physical discomfort and fatigue at the end of the day (see **Appendix B**).

Student's perception impacted by car mode: There is relatively low impact by car mode for school traveling, which student perceive as having positive impact such as safety for long-distance commuting and being less likely to be involved in accidents. In addition, car mode also provides comfort and relaxation, which is great for students to rest after a long day after school (see **Appendix B)**.

Contrastingly, a surprising number of students voice their concerns over the negative impact of cars for their daily commuting to school, such as time-consuming, and slow commuting that occurs by traffic congestion. Students mention that car mode is very prone to traffic jam, which waste a lot of their time and cause them to lose opportunities due to time wasted on the road (see **Appendix B)**.

In sum, students perceive mass transit as highly convenient, greatly impacting their daily lives through convenience, time efficiency, social interaction, punctuality, and effective time management while avoiding traffic congestion. On the other hand, using mass transit also leads to exhaustion, physical discomfort, and fatigue after long commutes. In contrast, commuting in car mode provides comfort, relaxation, and safety. However, it is vulnerable to traffic jams and results in long travel times, wasting time in life and potentially impacting students' study productivity and personal time.

To further examine students' perception, the questionnaire asked "When you grow up, are you going to buy a car? Could you give us a reason why?" This will gain insight into student perception and shed light on their perception of how transportation modes for school traveling affect their mode choice in adulthood.

4.4.2. Perception of student on car ownership

Table 13. Student's desire to buy a car when grow up

	School						Total	
	Sathit Chula		Sathit Patumwan		Triam Udom Suksa			
	N	%	N	%	N	%	N	%
Buy	20	69%	13	62%	20	67%	53	66%
Not buy	2	7%	1	5%	1	3%	4	5%
Maybe buy	3	10%	7	33%	6	20%	16	20%
Rather not say	4	14%	0	0%	3	10%	7	9%
Total	29	100%	21	100%	30	100%	80	100%

Despite receiving positive feedback from students about how mass transit positively impacts their daily lives in terms of convenience, time efficiency, social interaction, punctuality, effective time management, and avoiding traffic congestion, a majority of students (66%) desire to buy a car in the future, while 20% response maybe, and only 5 % said no (see **Table 13**). Among students, the Sathit Chula students group has the highest desire to buy cars (69%), it exhibit that this potentially due to their high reliance on car mode to school which shaping their transportation mode and desire in the adulthood. In addition, 62% of Sathit Patumwan also express their desire to own a car in the future, which might be from the car reliance group and exhibits the same behavior with Sathit Chula students.

On the other hand, it is surprising to discover that Triam Udom Suksa students (67%) show a significant number of students desire to own a car in the future, despite their current use and heavy reliance on mass transit. In the following section, Word Cloud demonstrate to illustrate the common reason why student want to own a car in the future and why not.

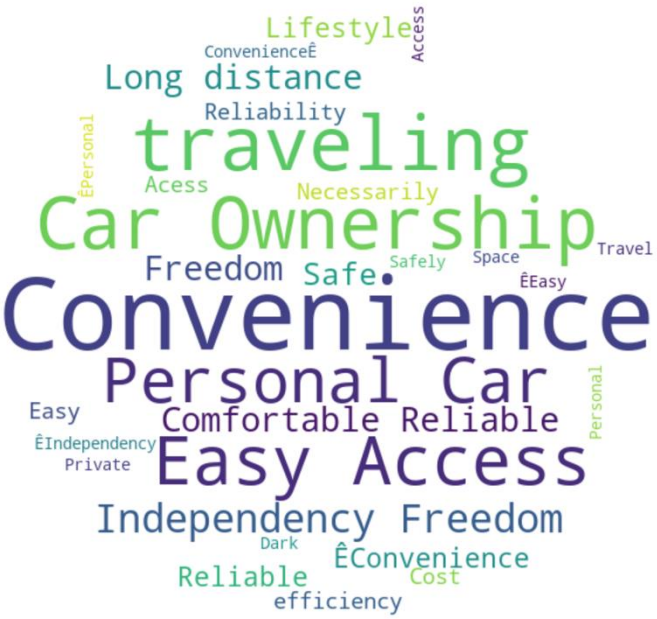


Figure 12. Word Cloud for "When you grow up, are you going to buy a car? Could you give us a reason why?

Based on generated Cloud Word, it portrays that the most frequent words mentioned by students are convenience, car ownership, easy access, independence and freedom, comfort, and long-distance traveling. Exploring students' reasons for wanting to own a car in the future, it is crystal clear that most of the student value convenience, easy access, and personal desire for a vehicle. Students share a similar though with their statement such "Buy, because I want to have my own car, easy and convenient for traveling" (SC3, 2023) and "Buy, because it is easy and convenient to go around" (SC28, 2023). It implies, that car become a primary lifestyle among these students because they are growing up in a car oriented (see **Appendix C**).

Moreover, students continue mentions such as “Buy, because I feel that it is safer than public transportation” (SC6, 2023), “Buy, because I can travel anywhere I want with privacy (SC16, 2023)” and “Buy, because I can travel outside of Bangkok” (SC25, 2023). It reveals that students are motivate by the safety factor, independence, long-distance traveling, and freedom on private vehicle (see **Appendix C**).

On the contrary, a minor (5%) of students may aware of the negative impact by the car vehicle and wish not to buy a car in the future. Students who put faith and trust the current mass transit systems in Bangkok, mentions “Not buy, because I can travel with the public transportation” (SC14, 2023), and “not buying, because in the future, traveling may be convenient and public transportation may be accessible” (SP7, 2023). Moreover, student whose concern with the safety concern state “not buy, because I want to risk from driving” (SP20, 2023). These diverse perspectives shed light on the various considerations influencing students' attitudes towards car ownership.

Henceforth, findings reveal that the majority of the students from the three schools express a strong desire to buy a car in the future. These findings highlight characteristics and behavior toward car ownership in Thai society, which owning a car has become a normal lifestyle choice as individuals grow up.

Furthermore, a crosstabulation of **Table 14** reveals the relationship between household characteristic and students’ desire to own a car. Surprisingly, students living in the TOD household shows a comparable level of desire to own a car in the future as students living in the non-TOD household. Despite living proximity to the mass transit, 60% of the students express a strong affection to buy a car, mirroring the sentiment among 74.3% of students in non-TOD household. This unexpected similar perception may go against the belief that TOD areas reduce the inclination toward car ownership. It implies that students still strongly prefer owning a car, influence by factors such as easy access, convenience, independence, and reliability. Additionally, it is challenging

for the transport and urban planner urges for a reconsideration of the impact of car ownership in the TOD area.

Table 14. Desire to Buy Car and Household Characteristic Crosstabulation

		Household Characteristic				Total	
		TOD household		Non-TOD household			
		N	%	N	%	N	%
Buy Car	Rather Not Say	1	2.2%	6	17.1%	7	8.8%
	Buy	27	60.0%	26	74.3%	53	66.3%
	Not Buy	3	6.7%	1	2.9%	4	5.0%
	Maybe	14	31.1%	2	5.7%	16	20.0%
Total		45	100.0%	35	100.0%	80	100.0%

5. Chapter 5: Conclusion and Discussions

5.1. Research Conclusion

Many students currently utilize mass transit for commuting and perceive a positive perception as benefits to their daily life, such as punctuality, time efficiency, effective time management, increased social interactions, and enhanced productivity. However, a minority of students experience negative impacts such as physical discomfort and fatigue at the end of the day due to long-standing and extra walking from mass transit. Regardless, for this group of students, owning a car is their long-term goal.

Students identify safety (76%), travel cost (65%), and parental permission (65%) as critical factors that affect their mode choices for school travel. The analysis reveals various perspectives on safety across the schools, with Sathit Chula students, who heavily rely on a car, considering this mode the safest. In contrast, most Triam Udom Suksa students mark mass transit as their safest mode of transportation. Meanwhile, Sathit Patumwan students select car and mass transit.

Furthermore, in the examination of students' attitudes, the majority of Triam Udom Suksa and Sathit Patumwan students express feeling safe traveling alone on mass transit, indicating high confidence in current security systems. On the contrary, Sathit Chula students show higher disagreement, possibly indicating room for improvement in mass transit security for diverse groups who have similar characteristics.

In addition, parental permission and travel costs are significant considerations, with 65% of participants acknowledging these as factors that affect their mode choice. Based on students' socioeconomic characteristics, the majority of the students (36.8%) receive THB 8,000-13,000 monthly, however, 47.5% of students predominantly spend less than 500 THB monthly on traveling costs. The inconsistent data may explain the factors that affect student travel frequency on mass transit.

Based on travel information, 42.5% of students travel on mass transit less than once a week, 12.5% travel 3-5 times a week, and 35% travel daily. The significant result in students' low trip frequency on mass transit may be caused by low travel expenses. Despite receiving a high allowance from their parents, their monthly travel expense is low, implying that students may want to spend their allowance on personal rather than travel costs.

In the exploration of students' attitudes, the majority of Sathit Patumwan (71.4%) and Triam Udom Suksa (80%) convey strong agreement toward the statement, "If the travel fee is lower, you will use mass transit BTS/MRT to school more often." which explains factor impact to the travel frequency on mass transit. Mass transit in Bangkok is expensive and not affordable for students, emphasizing the need for a fare fee reduction and the urge for affordable transportation solutions.

Parental permission is a significant factor shaping and impacting students' mode choice, which ranks 65% of students. Among students, Sathit Chula (41%) is the least

to grant permission to use mass transit, while the majority of Sathit Patumwan (86%) and Triam Udom Suksa (83%) are allowed. Correspondingly, students' trip accompanies reveal that the majority of students (41.3%) commute to school with their parents, while another 43.8% are capable of traveling alone. It implies that students who travel alone may utilize mass transit more than students accompanied by their parents.

The study further investigates factors that affect students' permission on mass transit, revealing safety, convenience, reliability, trust in children's independence, and situational factors as key determinants. Conversely, students are not allowed to use mass transit due to safety concerns, limited access to mass transit, and the same destination as the parents' workplace. Therefore, parental permission has a dominant influence on students' mode choice for school travel.

The study demonstrates the relationship between students' independence level from parents and the mode selection for school trips. Most Triam Udom Suksa and Sathit Patumwan students have a higher level of independence. As a result, these students have a higher preference on mass transit mode. Meanwhile, Sathit Chula has a low independence level, which exhibits high reliance on car mode and parents.

The statistical analysis confirms this strong connection and suggests that the relationship is not a result of chance and there is a noticeable trend or gradient present. Therefore, the null hypothesis can be confidently rejected: the level of independence from the student's family does affect the student's mode choice.

The findings reveal that 56.3% of students reside in TOD households; despite living in proximity to the mass transit station, the data reveals only 47.5% of students commute on mass transit (BTS/MRT) for school trips, while another 43.8% choose car

as a primary commute mode. Among students, Sathit Chula has the highest car usage (72.4%), while 73.3% of Triam Udom Suksa students utilize BTS and MRT the most.

Ultimately, despite the positive impact of mass transit on students' daily lives, a significant majority (66%) expressed a strong desire to buy a car in the future, while 20% said maybe and 5% said not buy. This inclination towards car ownership is likely due to 77% of participants having 1-2 cars on average in their households. It implies the high car presence in the household potentially influences car usage and car mode in adulthood.

Moreover, through cloud word analysis, student emphasizes the keywords, such as convenience, easy access, independence, freedom, comfort, and long-distance travel, as reasons for their desire to own a car. Students express a strong personal preference for owning a car and mention reasons like safety, privacy, easy access, and long-distance traveling outside of Bangkok. On the other hand, a minority (5%) of students are aware of the negative impacts of the car vehicle and wish not to buy a car in the future.

5.2. Key Findings

In conclusion, the key finding from the study shows that:

1. Socioeconomic and sociodemographic characteristics of households influence the travel behavior of students.
2. Travel cost is an explanatory factor that affects trip frequency in mass transit.
3. A student's independence from their parent affects their choice of school trips and how frequently they utilize BTS and MRT.
4. While acknowledging the benefits of public transportation by students, they still desire to own a car, potentially influenced by convenience, car ownership desire, easy access, independence, freedom, comfort, and reliability.

5.3. Discussions

This study's findings are consistent with a study by Pongprasert and Kubota, which was conducted in Bangkok, and found that car ownership rates in TOD households are not lower than in non-TOD households (2017). In addition, it shows that students who commute by private car have a higher desire to own a car in the future, which has the same attitude from a study by Fyhri and Hjorthol (2009). However, students who frequently use mass transit also show their desire to own a car, which has the same attitude as the study in Ho Chi Minh City, where users prefer private over public transportation due to its convenience, independence, and flexibility characteristic of private vehicle (Le & Trinh, 2016).

There is no significant correlation between household characteristics and students' desires to own a car; therefore, promoting mass transit use in TOD may not be enough. It is suggesting that Bangkok City may need a transportation policy to control car ownership population as a precaution to "using a car" and "owning a car".

Furthermore, students who currently use mass transit reveal that travel cost affects their frequency of utilization on mass transit. In addition, students show a strong attitude towards reduced travel fees and an inclination to travel on mass transit more frequently if the travel fee is lower. Therefore, by reducing fare fees, it may make mass transit more affordable for a diverse group of students and encourage more students to use mass transit for school trips. Moreover, a transportation policy with subsidizing pricing strategies that align with the preferences of students may potentially benefit stakeholders of BTS and MRT by promoting mass transit use among this group of students and increasing travel frequency for school trips.

5.4. Policy Recommendation

The high car ownership rates in the TOD area could have a long-term impact on the prevalent reliance on cars throughout Thai society. The implementation of Travel

Demand Management (TDM) in the TOD area of Bangkok has the potential to regulate sustainable car ownership. This approach draws inspiration from Singapore's transportation policy, incorporating the Vehicle Quota System (VQS) and Certification Of Entitlement (COE) as prerequisites for purchasing a car (Phang, 1993). The policy will stress on car ownership in the TOD, that has potentially to high car use. The policy will help regulate car ownership in the TOD, preventing excessive car usage and rapid population growth.

However, residing in TOD areas may permit car ownership, but a land-use policy should emphasize limitations on parking space ratios to optimize a sustainable car population. This policy aims to reduce the parking space area ratio by allocating more floor area ratio (FAR) to common or public spaces, resulting in more efficient land use and sustainable urbanization (Hendrigan & Newman, 2017). Limiting parking space availability may pose difficulties and challenges for drivers and reduce the attractiveness of driving.

Additionally, to prevent car usage in the inner city of Bangkok, an Electronic Road Pricing (ERP) system could introduced to operate during the weekdays. This measure has the potential to prevent heavy and reduce heavy traffic flow by imposing higher travel cost on car mode. Consequently, car users may still utilize cars for leisure and long-distance use while commuting on mass transit for work and school purpose.

Furthermore, considering fare subsidization based on the findings that reveal how travel cost affect to students' travel frequency on mass transit. This could encourage and promote more commuting into the city by mass transit for school trip. In addition, it may contribute to a shift away from the current car-centric culture and less reliance on car mode.

In summary, reducing parking ratios, implementing COE charges, and adopting VQS create a complicated process for car ownership, contributing to controlling a sustainable car population in the city. Moreover, limiting parking space availability may pose challenges for drivers, making driving less attractive. Meanwhile, ERP will increase the travel costs and control the car flow into the TOD area, making it most costly to travel during peak hours.

5.5. Future Research

The participants in this research are not fully grown adults; they are still young teenagers. Consequently, the information provided is limited concerning their personal data and their parents' perceptions. Additionally, the student population in this study lacks comprehensive data about their household location, making it challenging for this research to determine whether they reside in the HDZ, MDZ, or LDZ. Future research is necessary to pinpoint their locations for more accurate policy recommendations for Transportation Demand Management (TDM). Moreover, the study is confined to a specific range of schools. Therefore, future research could broaden its scope to include more schools located in proximity to mass transit stations in Bangkok City.

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Appendix A: Short answer question. Do your parents allow you to take mass transit BTS/MRT to come to school? Why?

Participants	Sex	Age	Answer	English Translate	Count
SC1	M	15	ใช้ได้แล้วแต่วัน	Allow, but depending on day	1
SC2	M	15			
SC3	F	16	อนุญาต เพราะ ปลอดภัย สะดวก	Allow, because safe and convenience	1
SC4	M	14	อนุญาติถึงอายุที่สามารถที่จะดูแลตัวเองได้แล้ว	Allow, because I reach the age that capable to take care of myself.	1
SC5	F	17	บางครั้งที่พวกเขาอนุญาต เพราะพ่อแม่เป็นห่วงความปลอดภัย	Allow, but sometime only because they care about safety	1
SC6	F	16	ไม่ เพราะเพราะความปลดภัย	Not Allow, because of safety	0
SC7	F	17	อนุญาติ บางทีพ่อแม่ไม่ว่าง	Allow, when they are not busy to chauffeur to school	1
SC8	F	17	ไม่ เพราะฉันเป็นเด็กผู้หญิง	Not allow, because I'm a girl	0
SC9	M	16	ไม่	Not allow	0
SC10	M	16			
SC11	M	16			
SC12	F	16			
SC13	F	17	ไม่เพราะกลัวคนเยอะ	Not allow, because afraid of crowded	0
SC14	F	16	อนุญาต เพราะเห็นว่าเราโตแล้ว	Allow, because I'm growing up now	1

SC15	M	16	ไม่ เพราะไปทางเดียวกัน	Not allow, because parents go to work same destination	0
SC16	F	15	No, because afraid of stranger	Not allow, because afraid of stranger	0
SC17	F	16	ไม่ เพราะรถไฟฟ้ามีคนเยอะ	Not allow, because afraid of crowded	0
SC18	F	16	อนุญาตเพราะสามารถเดินไปสถานีได้	Allow, because walkable to station	1
SC19	F	16	อนุญาต เพราะบางทีพ่อแม่ไม่ว่างก็ให้ หนูมาโรงเรียนเอง	Allow, when they are not busy to chauffeur to school	1
SC20	M	17	อนุญาต เพราะมีความปลอดภัยค่อนข้างสูง และสามารถควบคุมเวลาได้ค่อนข้างดี	Allow, because it safe and punctual	1
SC21	M	17	อนุญาตแต่โรงเรียนอยู่ใกล้บ้าน	Allow, because house near school	1
SC22	M	16	No, because my dad work at Chulalongkorn	Not allow, because my dad work at Chulalongkorn	0
SC23	M	17	No because they worried about my safety	Not Allow, because they worried about my safety	0
SC24	F	17	อนุญาตเพราะสะดวกและรวดเร็ว	Allow, because fast and convenience	1
SC25	F	17	No, because they also need to come to work and my brother's school on the same way	Not allow, because parents go to work same destination and need to drop off siblings	0
SC26	F	16	ไม่อนุญาต เพราะสถานีอยู่ไกลบ้านและรถไฟฟ้ามีคนเยอะ	Not allow, because station far from house and BTS/MRT has a lot of people	0

SC27	F	17	No, because it’s not safe	Not allow, because it's not safe	0
SC28	F	16	No, because there is no nearby stations to my house	Not allow, because there is no nearby stations to my house	0
SC29	M	17	อนุญาตเพราะพ่อแม่บอกว่าผมโตแล้ว	Allow, because I'm growing up now	1
SC30	M	16	Yes, when they are too busy to drop me off school or when i need to join extracurricular activities	Allow, because they are too busy to dorp me off at school and when I need to join extracurricular activities	1
SP1	F	16	Yes, because I’m old enough to go to school by myself	Allow, because I'm old enough to go to school by myself	1
SP2	F	16	ใช่ เพราะพ่อแม่บอกว่าฉันโตพอที่จะเที่ยวเองได้แล้ว	Allow, because I'm growing up now and can travel myself	1
SP3	F	17	ใช่ เพราะฉันโตแล้ว	Allow, because I'm growing up now	1
SP4	M	16	ให้ใช เพราะพ่อแม่ไม่ว่างพาไปโรงเรียน	Allow, because parents not free to chauffeur	1
SP5	M	16	อนุญา	Allow	1
SP6	F	14	อนุญาต	Allow	1
SP7	M	14	ไปเอง โตแล้ว พ่อแม่ขี้เกียจ	Allow, because I'm growing up now and don't want to bother parents	1
SP8	M	17	Yes, it's fast and cheap	Allow, because it's fast and cheap	1
SP9	F	15	อนุญาต เนื่องจากเป็นเส้นทางที่ใกล้เคียง	Allow, because house near the stations route	1
SP10	M	17	ให้ เพราะไม่มีคนมาส่ง	Allow, because no one free to chauffer	1
SP11	M	14	ให้ เพราะ โตแล้ว	Allow, because I'm growing up now	1

SP12	F	13	ไม่เพราะกลัวว่าไม่ปลอดภัย	Not Allow, because of safety	0
SP13	M	14	อนุญาต เพราะเค้าให้	Allow	1
SP14	F	14	อนุญาต เพราะพ่อแม่อยากให้ใช้ชีวิตคนเดียวเป็น	Allow, because parents want me learn to live independent life	1
SP15	F	17	Allow because it's convenient and safe	Allow because it's convenient and safe	1
SP16	M	15	อนุญาต เพราะผมโตแล้ว	Allow, because I'm growing up now	1
SP17	M	14	อนุญาตบางทีพ่อแม่ขี้เกียจ	Allow, when they are not busy to chauffeur to school	1
SP18	M	16	อนุญาต เพราะบางครั้งที่บ้านไม่สะดวกมาส่งหรือมารับ	Allow, because when no one free to chauffeur to school	1
SP19	M	16	ไม่อนุญาตเพราะพ่อแม่กังวลเรื่องความปลอดภัย	Not Allow, because of safety	0
SP20	F	14	ไม่เพราะพ่อแม่กลัวไม่ปลอดภัย	Not Allow, because of safety	0
SP21	F	14	Allow, because my parents want me to be independent as I grow up	Allow, because my parent want me to be independent as I grow up	1
SP22	F	17	อนุญาต เพราะสะดวกและปลอดภัยวางใจได้	Allow, because it safe and reliable	1
SP23	M	15	อนุญาต	Allow	1

SP24	M	16	อนุญาต เพราะเป็นวิธีสะดวก	Allow, because it is a convenience method	1
SP25	F	16	No, because station too far from my house	Not Allow, because stations far from house	0
SP26	F	17	Yes, sometime when their schedule very busy	Allow, sometime when their schedule very busy	1
SP27	M	16	ไม่ เพราะไปทางเดียวกัน	Not allow, because parents go to work same destination	0
SP28	M	16	อนุญาตเพราะผมโตแล้วไม่อยากรบกวนคุณยาย	Allow, because I'm growing up now so I don’t want to bother my grandma	1
SP29	M	17			
SP30	F	16	ไม่เพราะไม่ปลอดภัย	Not allow, because it's not safe	0
TUS1	F	18	อนุญาต เพราะรรอยู่ใกล้mrt	Allow, because house near stations	1
TUS2	M	17			
TUS3	M	17	อนุญาต	Allow	1
TUS4	M	17	ใช่เพราะใกล้บ้าน	Allow, because house near stations	1
TUS5	M	17	อนุญาตเพราะลูกโตพอที่จะเดินทางคนเดียว	Allow, because I'm growing up now and can travel myself	1
TUS6	F	17	ใช้ เนื่องจากรวดเร็ว ปลอดภัย ราคาเหมาะสม	Allow, because fast, safe and reasonable price	1
TUS7	F	17	อนุญาติเพราะสะดวกและปลอดภัยสำหรับการเดินทางคนเดียว	Allow, because convenience and safe for traveling alone	1

TUS8	M	16	ไม่ เพราะแพงกว่ารถเมล์	Not Allow, because it's expensive than Bus	0
TUS9	M	17	จำเป็นต้องใช้	Allow, because need to travel	1
TUS10	F	18			
TUS11	F	17			
TUS12	F	18	อนุญาต เพราะรวดเร็วและเข้าถึงได้ง่าย	Allow, because fast and easy access	1
TUS13	M	18	อนุญาต เพราะคิดว่าน่าจะสะดวก ตรงเวลาและปลอดภัย	Allow, because convenience, safe and punctual	1
TUS14	M	17	อนุญาต เพราะใช้รถไฟฟ้าตรงเวลา	Allow, because of punctual	1
TUS15	M	17	ใช่	Allow	1
TUS16	F	17	อนุญเพราะจำเป็นต้องใช้	Allow, because need to travel	1
TUS17	F	17	อนุญาต	Allow	1
TUS18	M	16	อนุญาตเพราะไปโรงเรียนตรงเวลา	Allow, because of punctual	1
TUS19	M	16	อนุญาตเพราะผมเป็นเด็กผู้ชายแล้วโตแล้ว	Allow, because I'm a boy and I'm growing up now	1
TUS20	M	16	อนุญาต สะดวก รวดเร็ว ปลอดภัย	Allow, because convenience, safe and punctual	1
TUS21	M	17	ให้ สะดวก	Allow, because convenience	1
TUS22	F	15	ให้ เพราะเร็วกว่าและไม่เสียค่าน้ำมัน	Allow, because fast and not waste gasoline	1
TUS23	F	16	อนุญาตในบางครั้งเนื่องจากประหยัด	Allow, sometime because it's save parent's money and punctual	1

			ค่าใช้จ่ายและเวลาของผู้ปกครอง		
TUS24	M	16	ไม่ เพราะพ่อแม่และพี่สาวไปทางเดียวกัน	Not allow, because parents go to work same destination	0
TUS25	F	15	ใช่ เพราะสะดวกที่สุด	Allow, because it is most convenience	1
TUS26	F	15	อนุญาตเพราะสะดวก	Allow, because convenience	1
TUS27	M	15	อนุญาต เพราะ มันง่ายและเร็วกว่า	Allow, because it's fast and convenience	1
TUS28	F	18			
TUS29	F	17	ให้ เพราะ ขี้เกียจไปส่ง	Allow, because parent lazy to chauffeur to school	1
TUS30	F	17	ไม่อนุญาต เพราะสถานีไกลจากบ้าน	Not allow, because station far from house	0
			(1) Allow Total	59	66%
			(0) Not Allow, Total	22	24%
			(Missing Value) Rather Not Say	9	10%
			Total	90	100%

Appendix B: Short answer question. In your opinion, how do you think your mode of transportation impacts your daily life, studies, social skills, and overall well-being?

Participants	Sex	Age	Answers	English Translate	Count
SC1	M	15	ได้พูดคุยกับเพื่อนเวลากลับบ้าน	I can have a conversation with friend when getting back home	1
SC2	M	15			0
SC3	F	16	ถ้าเหนื่อยกับการเดินทางมากไปแล้วรู้สึกว่าทำให้ไม่สามารถ	If traveling make me tried then I feel It make me unable to study fully because of the fatigue from the traveling	1

			เรียนได้เต็มที่ เพราะความเหนื่อยล้าที่เกิดขึ้น		
SC4	M	14	ส่งปฏิสัมพันธ์ทางสังคมถึงระดับนึง ต้องคำนึงถึงความสะดวกในการคมนาคมเมื่อออกไปเที่ยงกับเพื่อนหรือนัดทำงาน	It give a good connection in social interaction. The convenience from the traveling should take as a priority number 1 when going out with friend or make an appoinment for work	1
SC5	F	17	ใช้เวลานาน ทำให้บางวันเหนื่อย แต่ถ้านั่งรถสบายดีกว่าไม่ต้องยืนนาน	It takes a long time, making some days tiring. But if sitting in a car is better than not having to stand for a long time	1
SC6	F	16			0
SC7	F	17	จะได้ทำอะไรได้มากมายถ้ารถไม่ติดมาก	I would be able to do a lot of things if the traffic wasn't so congested.	1
SC8	F	17			0
SC9	M	16	ไม่รู้	I don't know	2
SC10	M	16			0
SC11	M	16			0
SC12	F	16			0
SC13	F	17	No	No Effect	2
SC14	F	16	การเดินทำให้ประหยัดค่าใช้จ่าย	Walking help saving money on traveling cost	1
SC15	M	16			0
SC16	F	15			0
SC17	F	16	ไม่ส่งผอะไรเลย	No effect	2

SC18	F	16	การเดินทางโดยเดินมันช่วยให้สุขภาพดีขึ้นและแข็งแรงด้วย เหมือนได้ออกกำลังกายทุกวัน	Traveling by walking helps to improve your health and strength. It is like exercising every day	1
SC19	F	16	หนูรู้สึกว่าเวลาใช้รถ ไปโรงเรียนใช้เวลานานเสียเวลา แต่ได้พักผ่อนนั่งสบาย แต่เวลาใช้พรถไฟฟ้าแล้วกว่าแต่เหนื่อยนิดนึง	I feel like when I use the car going to school takes a long time and wastes time. But I was able to relax and sit comfortably. But when using the electric train, it's a bit tiring from standing and walking.	1
SC20	M	17	ส่งผลพอสมควร ถ้าเดินทางด้วยรถสาธารณะจะใช้เวลาเดินทางค่อนข้างนาน แต่ถ้าเดินทางด้วยรถส่วนตัวจะใช้เวลาน้อยกว่าประมาณ 20-40 นาทีเลย	If traveling by public transport, it takes quite a long time to travel. But if traveling by private car, it takes about 20-40 minutes less time.	1
SC21	M	17			0
SC22	M	16	I think I can spend my wasted time from traffic jam on many different thing such as sleep or reading.	I think I can spend my wasted time from traffic jam on many different thing such as sleep or reading.	1
SC23	M	17	I don’t think impact anything	No effect, I don't think give any impact	2
SC24	F	17	การขึ้นลงบันได BTS ช่วยฉันออกกำลังกายได้นิดหน่อย	When going down and up the stair BTS it help me with a little exercise	1

SC25	F	17	I think traveling with car take a lot of time and i hate traffic jams	I think traveling with car take a lot of time and I hate traffic jams	1
SC26	F	16	ไม่มี	No effect	2
SC27	F	17			0
SC28	F	16	I can enjoy in my car seat and resting along the way home.	I can enjoy in my car seat and resting along the way home.	1
SC29	M	17	ผมไม่จำเป็นต้องรีบกลับบ้านหลังเลิกเรียน	I don't need to rush home after school	1
SC30	M	16	I think taking BTS to school can avoid a traffic jams on the road	I think taking BTS to school can avoid a traffic jams on the road	1
SP1	F	16	Yes, taking BTS has less traffic jam than bus or car.	Yes, taking BTS has less traffic jam than bus or car.	1
SP2	F	16	ถ้ารถติดใช้ BTS/MRT ประหยัดเวลา จะได้มีเวลาทำการบ้านมากขึ้น	If the traffic jam, I use BTS/MRT. There is no need to mention the actions of the house any further	1
SP3	F	17	การใช้ BTS มันช่วยเลี่ยงรถติด	Using BTS/MRT can help avoid the traffic jams	1
SP4	M	16			0
SP5	M	16	ถ้าราคา BTS ลดลงกว่านี้ จะมีเงินไว้ใช้จ่ายอย่างอื่น	If the travling cost on BTS lower, I can use money on difference thing	1
SP6	F	14	ส่งผลทำให้เหนื่อยมากขึ้น	Resulting in more fatigue at the end of the day	1

SP7	M	14	มีเวลาในการทำงานใส่ใจ อะไรกับสิ่ขรอบตัวได้มาก	Have more time to work and can pay attention to my surrounding more	1
SP8	M	17	Makes the commute home very slow	Make the commute home very slow	1
SP9	F	15	ส่งผลต่อเวลาที่ใช้ในการเดินทาง และเวลาที่เหลือในการใช้ชีวิตประจำวันอื่น ๆ	Affecting to the traveling time and the rest of the remaining time in my life	1
SP10	M	17	กลับ bts แล้วได้เดินไปกับเพื่อนๆ และกลับบ้านเมื่อไหร่ก็ได้ ทำให้มีปฏิสัมพันธ์ทางสังคมมากขึ้นเยอะ	When I going back home with BTS I can go with my friend and what time I want, which make me have a stronger social connection in society	1
SP11	M	14	ถ้ากลับทางBts/Mrtก็จะมีเพื่อนทีกลับด้วยกัน	I can make friend with friend that going back home by BTS/MRT	1
SP12	F	13	-		0
SP13	M	14	มันเป็น first impressions ของคนเวลาจะทำความรู้จักกับใคร	It give us a first impression when you make friend with someone	1
SP14	F	14	การเดินทางด้วยBTSทำให้สะดวกขึ้นในเวลาที่เร่งรีบ และทำให้ตรงค่อเวลามากขึ้นเพราะเวลาเดินทางคงที่ไม่เหมือนขับรถ	Traveling by BTS makes it more convenient when you're in a rush. And make it more punctual because the travel time is constant unlike driving a car	1
SP15	F	17	I think it's very importance since I have to maximize the time and manage it wisely.	I think it's very importance since I have to maximize the time and manage it wisely.	1

SP16	M	15	การเดินทางกลับบ้านโดยรถ ทำให้เสียเวลาชีวิตมาก	Traveling back home by car make me waste a lot of time in life	1
SP17	M	14	บางวิธีทำให้มีเวลาทำการบ้าน และอะไรอื่นๆได้มากกว่า	Some mode, make me have more time on doing homework and something else	1
SP18	M	16	เป็นการสำรวจสถานที่ต่างๆแบบลงลึก เห็นถึงรายละเอียดยิบๆย่อยๆที่การนั่งรถผ่านอาจจะมองไมาเห็น และทำให้สุขภาพดีขึ้น	It is an in-depth exploration of various places. I can see the little details that driving by car might not be able to see and can improve health more healthier	1
SP19	M	16	ถ้ากลับบ้านโดยรถไฟฟ้าน่าจะถึงบ้านเร็วกว่านี้	If getting back home by train it might be faster than	1
SP20	F	14	นั่งรถส่วนตัวสะดวกและปลอดภัยกว่ารถไฟฟ้า	I think, sitting inside my personal car is more comfortable and safe than a train	1
SP21	F	14	Traveling in car during rush hours is waste of time. I think traveling on BTS during hours save a lot of time and more convenient.	Traveling in car during rush hours is waste of time. I think traveling on BTS during hours save a lot of time and more convenient.	1
SP22	F	17	สำคัญมากเพราะทำให้เราใช้เวลาให้เกิดประโยชน์	It is very important because it allows us to use our time productively.	1
SP23	M	15	ส่งผลทำให้เหนื่อยมาก บางวันต้องยืนอยู่บน	It is very tiring, someday have to standing in the train very long time and have to walk home from station.	1

			รถไฟฟ้านาน แล้วต้องเดินกลับบ้าน		
SP24	M	16			0
SP25	F	16	I think if traffic congestion issue getting better, i can have more time spend on many things	I think if traffic congestion issue getting better, i can have more time spend on many things	1
SP26	F	17	Taking BTS to school help me with time management and i can socialize with my friend after school	Taking BTS to school help me with time management and i can socialize with my friend after school	1
SP27	M	16	ผมรู้สึกว่ารถใช้เวลานานมาก แต่ถ้าพ่อแม่อนุญาต ให้กลับบ้านโดยรถไฟฟ้าจะได้ออกไปเที่ยวกับเพื่อนและจะได้กลับบ้านด้วยกันทุกวัน	I feel that taking a car is spend a lot of time but if my parent allow me to get back home by train. I might have time to hangout with friend and can I go back home together everday.	1
SP28	M	16	หากใช้เวลาอยู่บนรถนาน มันเสียเวลาชีวิตไปเปล่า	If spending a long time in a car, it is a waste of time in life.	1
SP29	M	17			0
SP30	F	16	ถ้าประเทศไทยมีถนนที่ใหญ่กว่าและมีทางด่วนมากกว่านี้ได้ มันอาจจะรถติดน้อยกว่าแล้วฉันสามาใช้เวลาไปโรงเรียนน้อยลง	If Thailand had bigger roads and more expressways. There might be less traffic and I can spend less time going to school.	1

TUS1	F	18	ถ้ารถติดมาก ทำให้ตารางเวลาไม่เป็นแบบที่ตั้งไว้	If there is a lot of traffic, it make the schedule will not be as planned	1
TUS2	M	17			0
TUS3	M	17			0
TUS4	M	17			0
TUS5	M	17	บางวิธีเสียเวลาชีวิตไปเปล่า	Some mode is a waste of time in life	1
TUS6	F	17	ทำให้เหนื่อยในบางวัน	It give me a fatiague someday	1
TUS7	F	17	ส่งผลในเรื่องของเวลา ,ความปลอดภัย ระบบการขนส่งสาธารณะของประเทศไทยยังไม่ดีพอ ไม่สามารถควบคุมเรื่องเวลาการเดินทางได้ถ้าไม่ใช่รถไฟฟ้า facilities ของยานพาหนะไม่ดี,เก่า	Effects on time and safety. Thailand's public transportation system is not good enough. Can't control travel time if it's not an electric train. facilities of vehicles are poor and old	1
TUS8	M	16			0
TUS9	M	17	ส่งผลอย่างมาก	It is greatly affect	1
TUS10	F	18	ส่งผลอย่างยิ่ง เพราะว่าหากเวลาในการเดินทางน้อยเรามีโอกาสที่จะได้ทำบ้างสิ่งมากขึ้น และลดโอกาสที่จะเกิดอุบัติเหตุ หรือความเสี่ยงต่างๆที่เป็นผลมาจากการเดินทางไกล	It give a greatly effect because if the travel time is less, we have the opportunity to do more things. and reduce the chance of accidents or various risks resulting from long distance travel	1

TUS11	F	17	การเดินทางใช้เวลาน้อย ทำให้เรามีโอกาสทำบ้างสิ่งมากขึ้นและมีเวลานอนเพียงพอ	If traveling use less time, it gives us more opportunities to do things and enough time to sleep.	1
TUS12	F	18	ส่งผล ทั้งเรื่องเวลาและค่าใช้จ่าย	It affects both time and expenses	1
TUS13	M	18	วิธีการเดินทางที่ดีจะช่วยวางแผนการใช้ชีวิตได้ง่ายขึ้น สะดวกสบายมากขึ้น และเกิดความเป็นเมืองที่ผู้คนสามารถมีคุณภาพชีวิตที่ดีได้มากขึ้น	A good traveling method, will help make plan in your life more easierl, more comfortable, and become a city where people can have a better quality of life.	1
TUS14	M	17	การเดินทางด้วยรถไฟฟ้า ทำให้เราไปไหนตรงเวลา มีการวางแผนที่ดี	Travling by the train make you go anywhere on time and have a good plans	1
TUS15	M	17	บางวิธีรอนาน แต่รถติด ทำให้เสียเวลาในชีวิต	Some mode, make you wait a very long time but car mode make you waste a lot of time in life	1
TUS16	F	17	ทำให้เราไปเรียนตรงเวลา	It help me to get to school punctually	1
TUS17	F	17	การเดินทางโดยรถไฟฟ้าช่วยดูแลสิ่งแวดล้อมและลดมลพิษทางอากาศ	Traveling by train help protect the environment and reduce the air pollution	1
TUS18	M	16	การเดินทางด้วยรถไฟฟ้าทำให้ผมมีอิสระในการออกไปเที่ยวกับเพื่อน	Traveling by train give me a freedom to hangout with friend	1

TUS19	M	16			0
TUS20	M	16	ทำให้ชีวิตง่ายฝึ๊น	It make life more easier	1
TUS21	M	17	เดินทางเร็ว ประหยัดเวลา ทำอย่างอื่นได้	Traveling fast, saving time and have time on do other stuff	1
TUS22	F	15	ใช้เวลานาน	It consum a lot of time	1
TUS23	F	16	หากใช้เวลาเดินทางเยอะ จะเสียเวลาในการทำกิจกรรมอื่น ๆ เช่น การอ่านหนังสือ ทบทวน หรือเวลานอน	If you spend a lot of time on traveling It will waste time doing other activities such as reading, reviewing or sleeping time.	1
TUS24	M	16			0
TUS25	F	15	มีเพื่อนจากการไปขึ้นรถไฟฟ้าด้วยกันได้ ถ้าหากมีรถก็สะดวกสบายเวลาจะไปเที่ยวกับเพื่อน	You can make friends from going on the train together. But if you have a car, it's convenient when going out with friends.	1
TUS26	F	15	มีเพื่อนจากการไปขึนรถไฟฟ้าด้วยกันและได้ออกไปเที่ยวด้วยกันหลังเลิกเรียน	You can make friend from going on the train together and I can hanging out together after school	1
TUS27	M	15	ไม่ได้มีอะไรมาก	No giving effect that much	2
TUS28	F	18			0
TUS29	F	17			0
TUS30	F	17			0
(1) Giving answer total				61	68%
(2) Answer with no effect				6	7%

(0) Rather not say	23	26%
Total	90	100%

Appendix C: Short answer question. When you grow up, are you going to buy a car? Could you give us a reason why?

Participants	Sex	Age	Answers	English Translate	Count
SC1	M	15	ซื้อเพราะใช้เดินทาง	Buy, because for traveling	1
SC2	M	15			0
SC3	F	16	ซื้อ เพราะอยากได้ความเป็นส่วนตัว/ความสะดวกสบาย	Buy, because I want to have my own car, easy and convenience to traveling	1
SC4	M	14	ซื้อ สะดวกสบายในการคมนาคม	Buy, because convenience to traveling	1
SC5	F	17	ซื้อ เพราะอยากได้ความเป็นส่วนตัว/เดินทางสะดวก	Buy, because I want to have my own car, easy and convenience to traveling	1
SC6	F	16	ซื้อ เพราะรู้สึกว่ารถปลอดภัยกว่ารถสาธารณะ	Buy, because I feel that it is safer than public transportation	1
SC7	F	17	ซื้อเพราะอยากได้รถของตัวเอง	Buy, because I want my own car	1
SC8	F	17	ซื้อเพราะถ้ามีรถสวนตัวไปไหนไม่ต้องลำบากให้คุณพ่อมารับ	Buy, because I want to have my own car and can go anywhere I want without my parents to chauffeur me	1
SC9	M	16	ซื้อ	Buy	1
SC10	M	16			0

SC11	M	16			0
SC12	F	16	ซื้อ เพราะแพ้แดด	Buy, because I'm allergic to sunlight	1
SC13	F	17	Yes,I can easily help me with transportation	Buy, because it easily help me with transportation	1
SC14	F	16	ไม่ เพราะสามารถเดินทางด้วยรถประจำทางได้	Not Buy, because I can travel with the public transportation	2
SC15	M	16	ซื้อเพราะไปไหนสะดวก	Buy, because I can go anywhere convenience	1
SC16	F	15	Yes because i travel anywhere i want with privacy	Buy, because I can travel anywhere I want with privacy	1
SC17	F	16	ซื้อ เพราะเดินทางง่าย	Buy, because I can travel easily	1
SC18	F	16	ไม่ ถ้าเดินได้หรือใช้รถสาธารณะได้ ก็ไม่จำเป็นซื้อเพราะว่ามันประหยัดค่าใช้จ่าย	Not buy, if I can traveling with public transportation option, it is not necessarily and save expense cost	3
SC19	F	16	ซื้อถ้าจำเป็น	Buy, If I need to use	3
SC20	M	17	ไม่ซื้อ ขับรถไม่เป็นและไม่อยากขับ	Not Buy, I cannot drive car and I don't want to drive car	2
SC21	M	17	ซื้อ	Buy	1
SC22	M	16	I'm not sure yet but I do care about environmental issues, in the future if i live close to BTS/MRT i prefer not	Not buy, if I live close to BTS/MRT because I care about environmental issue	3
SC23	M	17	Yes, because everyone own a car these day	Buy, because everyone own a car these day	1

SC24	F	17	ซื้อเพราะไปต่างจังหวัดได้	Buy, because I can travel to province	1
SC25	F	17	Yes, for traveling outside Bangkok	Buy, because I can travel outside of Bangkok	1
SC26	F	16	ซื้อเพราะนั่งบนรถสะดวก ไม่จำเป็นต้องรอนาน	Buy, because sitting in car is more comfortable and no one to wait long time	1
SC27	F	17			0
SC28	F	16	Yes, because it easy and convenience to go around	Buy, because it is easy and convenience to go around	1
SC29	M	17	ซื้อ	Buy	1
SC30	M	16	Yes i will because it's more reliable and safer at night	Buy, because it is more reliable and safer traveling during at night	1
SP1	F	16	Yes, if I need to travel a lot.	Buy, if I need to travel a lot	3
SP2	F	16	ใช่ ถ้าต้องเดินทางบ่อย	Buy, if I need to travel a lot	3
SP3	F	17	ไม่ ถ้ายังใช้ BTSได้ ไม่จำเป็น	Not buy, If I can still use BTS/MRT then it is not necessarily	3
SP4	M	16	ซื้ออยากได้รถสวนตัว	Buy, because I want my own car	1
SP5	M	16	ซื้อ ขับรถไปไหนสะดวกและน่าจะถูกกว่าใช้ BTS	Buy, because I can travel anywhere convenience and cost cheaper than BTS option	1
SP6	F	14	ซื้อเพราะอยากซื้อ	Buy, because I want to buy	1
SP7	M	14	ไม่ซื้อ อนาคต การเดินทางอาจเปนเรื่องสะดวก ขนส่งสาธารณะอาจเปนเรื่องที่เข้าถึงได้	Not buying, because In the future, traveling may be convenient. Public transportation may be accessible.	2

SP8	M	17	Not sure, we already have enough cars	Not sure, Because we already have enough car	3
SP9	F	15	ไม่ เนื่องจากไม่อยากเสี่ยงขับรถ	Not Buy, because i want to risk from driving	2
SP10	M	17	อยาก เพราะใช้ง่ายเดินทางสะดวก	Buy, because it can easy use and travel convenience	1
SP11	M	14	ซื้อเพราะเป็นสิ่งจำเป็นในการเดินทาง	Buy, because it is necessarily for traveling	1
SP12	F	13	ซื้อเพราะอยากเดินเอง	Buy, because I want to travel by myself	1
SP13	M	14	ซื้อ เพราะเดินทางสะดวก	Buy, because traveling convenience	1
SP14	F	14	ซื้อ เผื่อเดินทางไปต่างจังหวัด	Buy, because it can use to travel to provinces	1
SP15	F	17	Yes because it's convenient	Buy, because it convenience	1
SP16	M	15	ซื้อ จะไปไหนสะดวก	Buy, because I can go anywhere convenience	1
SP17	M	14	ไม่ซื้อถ้าอนาคตสถานที่ที่เข้าถึงได้โดยระบบขนส่งสาธารณะ	Maybe not buy, if the place are accessible from the public transportation in future	3
SP18	M	16	ซื้อ เพื่อความสะดวกในการเดินทางและออกบ้านได้สะดวก	Buy, because it is convenience in traveling and leaving the house easily	1
SP19	M	16	ไม่แน่เพราะพ่อแม่มีรถเพียงพอแล้ว	Not sure, because my parent have enough cars	3
SP20	F	14	ซื้อเพราะอยากได้รถส่วนตัว ไปไหนเองได้	Buy, because I want to have my own car and go anywhere by myself	1

SP21	F	14	Yes, for traveling outside of Bangkok	Buy, because for traveling outside of Bangkok	1
SP22	F	17	ซื้อค่ะ	Buy	1
SP23	M	15	ซื้อเพราะจะช่วยให้เดินน้อยลง	Buy, because it help me to walk less	1
SP24	M	16	ซื้อครับ อยากแข่งรถ	Buy, because I want to race car	1
SP25	F	16	Yes, it's help me complete task easy and safe than public transportation	Buy, because it convenience to complete different task easily and safe than public transportation	1
SP26	F	17	Maybe No, because i concern about the pollution in the city. But i will use my parents instead of buying more	Maybe No, because i concern about the pollution in the city. But i will use my parents instead of buying more	3
SP27	M	16	ไม่แน่ใจ	Not sure	3
SP28	M	16	ซื้อจะไปไหนสะดวก	Buy, because convenience to traveling	1
SP29	M	17	ซื้อ	Buy	1
SP30	F	16	ซื้อค่ะ เพราะไปไหนสะดวกและปลอดภัย	Buy, because convenience to traveling and safe	1
TUS1	F	18	ซื้อ เพราะเดินทางสะดวกกว่านั่งรถสาธารณะ	Buy, because it is comfortable than taking public transportation	1
TUS2	M	17			0
TUS3	M	17			0
TUS4	M	17	ไม่ครับ	Not buy	2

TUS5	M	17	ซื้อเพราะการขนส่งมวลชนในประเทศไทยย่ำแย่	Buy, because the public transportation in Thailand is poor quality	1
TUS6	F	17	ซื้อ เนื่องจากขับไปไหนมาไหนสะดวก	Buy, because can drive anywhere very convenience	1
TUS7	F	17	ซื้อ เพราะไม่ชอบการเดินทางด้วยรถสาธารณะ	Buy, because I don't like taking public transportation	1
TUS8	M	16	ซื้อถ้ามี ปัญญาซื้อ	Buy, if I can afford to buy	3
TUS9	M	17	ซื้อ เพราะอาจจำเป็นต้องใช้	Buy, because I might need to use	3
TUS10	F	18	ซื้อ	Buy	1
TUS11	F	17	ซื้อ	Buy	1
TUS12	F	18	ซื้อ เพื่อความสะดวกไม่ต้องใช้รถสาธารณะ	Buy, because for convenience and comfortable and no need to use public transportation	1
TUS13	M	18	ซื้อ แต่คิดว่าคงดู lifestyle การทำงานและการใช้ชีวิตด้วยว่า รถจำเป็นแค่ไหน แต่ก็คิดว่ามีความจำเป็น หากเป็นไปได้ก็อยากมี	Buy, but I will look at the lifestyle and where I work and life, then evaluate how nescessarily I need car. But if possible, I want to have my own car.	3
TUS14	M	17	ซื้อถ้าจำเป็นใช้รถประจำวัน	Buy, if I need to use car everyday	3
TUS15	M	17	ไม่แใจ	Not sure	3

TUS16	F	17	ซื้อเพราะคาใช้รถน่าจะถูกกว่า BTS	Buy, because cost to drive is might cheaper than use BTS	1
TUS17	F	17	ซื้อค่ะ	Buy	1
TUS18	M	16	ซื้อเพราะอยากได้รถส่วนตัว	Buy, because I want to have my personal car.	1
TUS19	M	16	ซื้อเพราะไปไหนสะดวก	Buy, because I can go anywhere convenience	1
TUS20	M	16	ซื้อ เพราะสะดวก	Buy, because can drive anywhere very convenience	1
TUS21	M	17	ซื้อ เดินทางเองได้อิสระ	Buy, because I can travel anywhere independently	1
TUS22	F	15	ซื้อ	Buy	1
TUS23	F	16	ไม่ กังวลปัญหามลพิษ	Not buy, because I concern about pollution issue	3
TUS24	M	16	ซื้อ	Buy	1
TUS25	F	15	ซื้อ เพราะสะดวกดี	Buy, because can drive anywhere very convenience	1
TUS26	F	15	ซื้อเพราะไปไหนกับเพื่อนสะดวก	Buy, because I can go anywhere convenience with friends	1
TUS27	M	15	อยากเพราะดูสะดวกกว่า	Buy, because I think it look more convenience	1
TUS28	F	18			0
TUS29	F	17	ซื้อ	Buy	1
TUS30	F	17	ซื้อ ไม่อยากเดินภายใต้ดวงอาทิตย์	Buy, because I don’t want to walk under the sun.	1
			(1) Buy Total	61	68%
			(2) Not Buy Total	5	6%
			(3) Maybe Buy Total	17	19%

(0) Rather Not Say	7	8%
Total	90	100%

VITA

NAME	Phannarithisen Ong
DATE OF BIRTH	09 November 1998
PLACE OF BIRTH	Phnom Penh
INSTITUTIONS ATTENDED	Bachelor of Art in Architecture, American University of Phnom Penh, 2021