

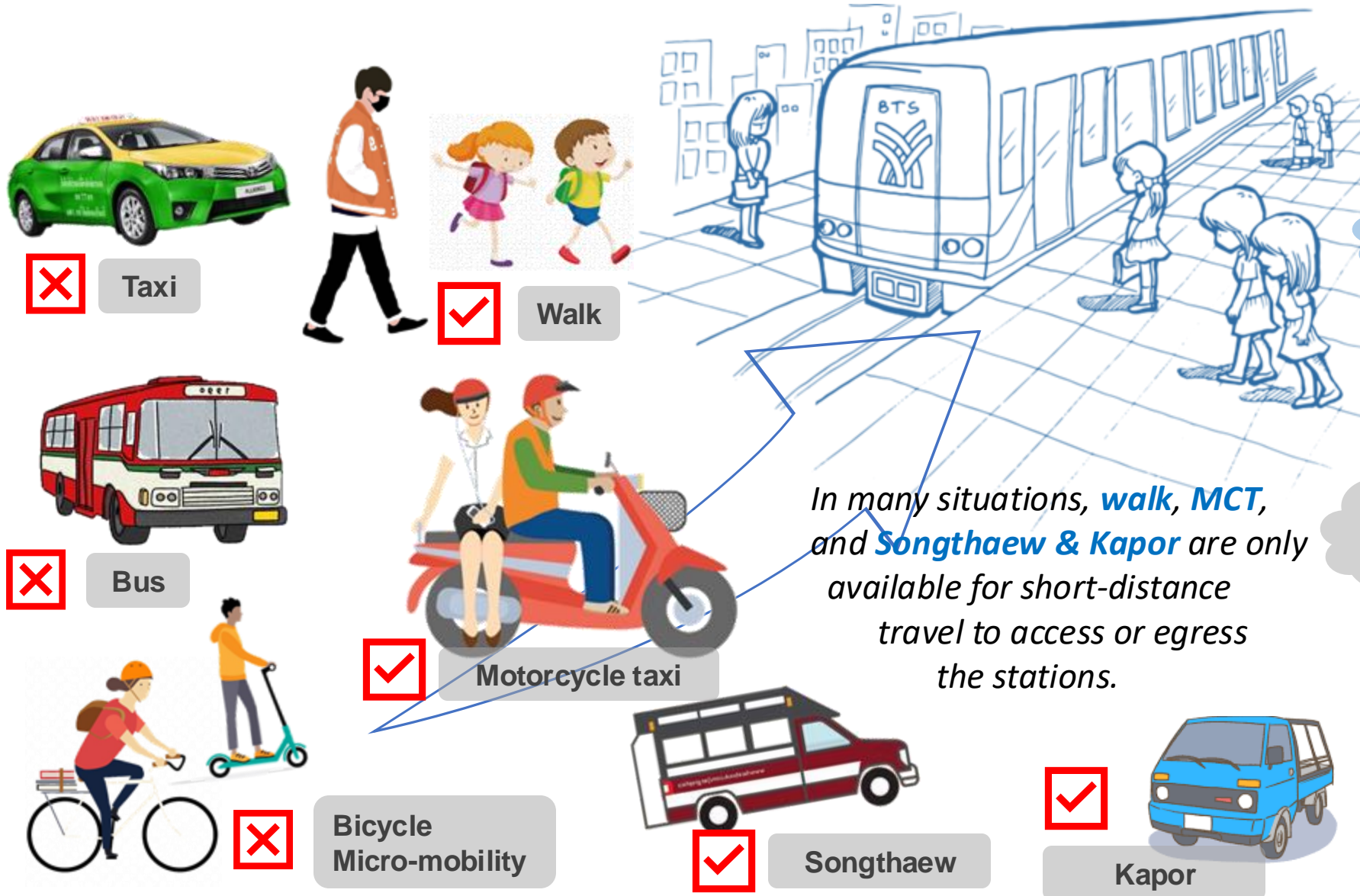
Project Number 5/2024

Project Title **Investigation of Operations and Services of Small Public Transport and Paratransit to Enhance Railway Station Access**

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Kasetsart University, Thailand



Rail Station Access Options



Safety

Security

Convenience

Time

Cost



Kapor Buses, also known as Silor-Lek

- **Small and modified pickup trucks**
 - Sometimes carry up to 9 passengers
- Operate on **fixed routes**
- **Faster and more direct alternative to larger buses,**
- **Convenient for passengers**
 - Traveling to and from railway station
- **Fits with some specific areas**
 - Narrow streets
 - High traffic congestion
- Sometimes, operate informally for hire, as a **Taxi**
 - Agreed fare and destination
 - Neither metered nor fixed route



Songthaew buses

- ❖ Modified pickup trucks: two rows of passenger seats
- ❖ Larger than Kapor buses, carrying a larger number of passengers
- ❖ Operating on a **fixed route** basis
- ❖ Flexible in terms of stops
 - Allow passengers to board and alight at various locations along the route



Demand-Side Challenges

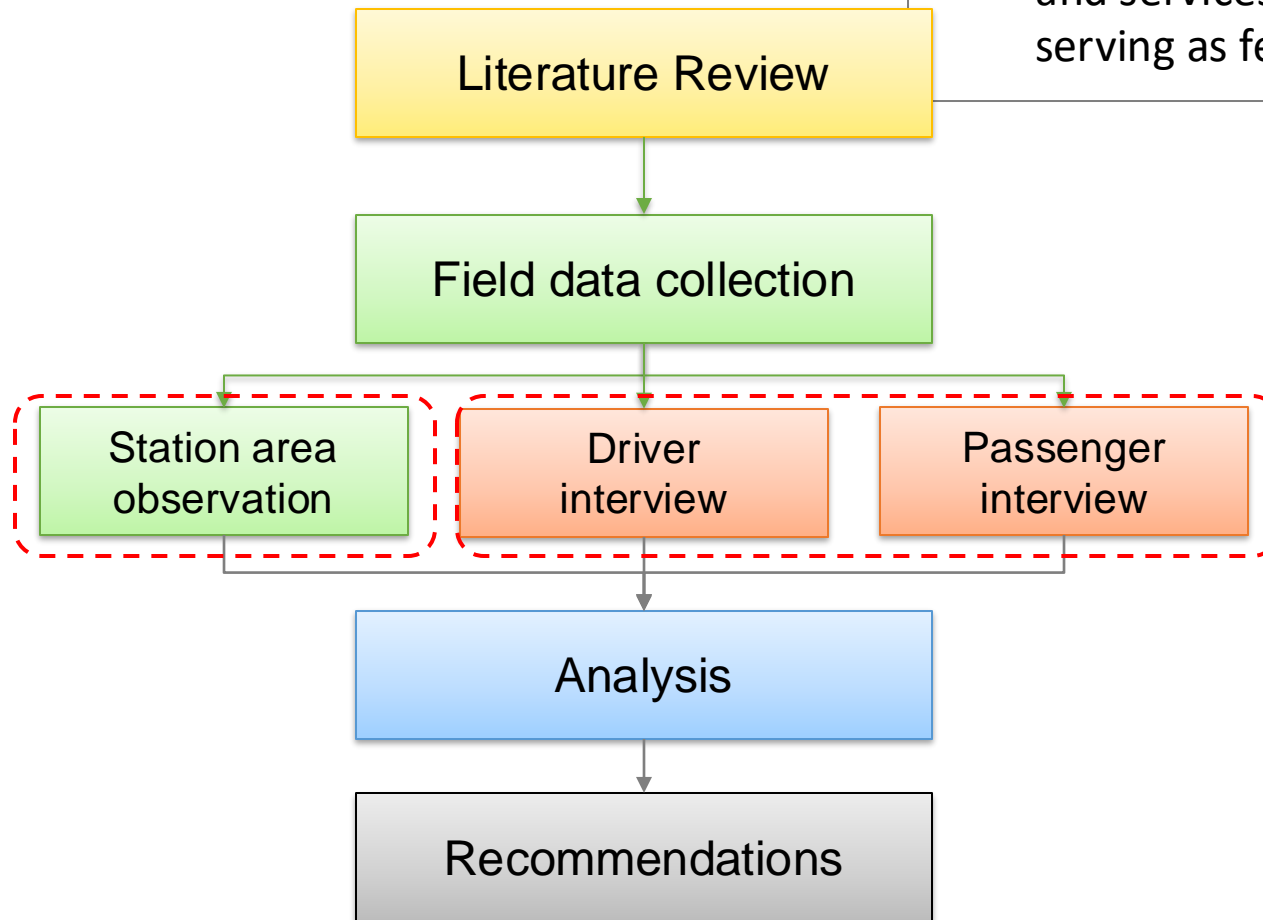
- ❑ **Safety Concerns:** Perceived as risky due to accident potential and traffic-related injuries.
- ❑ **Comfort & Convenience:** Compete with Songthaews and Kapor buses offering more comfort; lack of air conditioning and proper seating reduces appeal, especially in extreme weather.
- ❑ **Reliability Issues:** Irregular schedules and long waiting times cause inconvenience.
- ❑ **Accessibility Barriers:** Physical limitations hinder elderly individuals.
- ❑ **Negative Perceptions:** Concerns about cleanliness, professionalism, and overall **service quality** influence user preference, especially when alternatives like railways are available.

Supply-Side Challenges

- ❑ **Decentralized Operations:** **Independent/private operators** create a fragmented network, complicating integration into platforms like Mobility as a Service (MaaS).
- ❑ **Regulatory Compliance:** Difficulties in obtaining licenses and permits hinder legal operations.
- ❑ **Market Competition:** Face stiff competition from formal transit, **ride-hailing services**, and private vehicles, requiring differentiation to attract customers.
- ❑ **Profitability Issues:** Struggle in low-demand areas or highly competitive markets, further impacted by fluctuating fuel prices, **operating costs**, and **fare revenues**.

Methodology

- Examine regulatory frameworks governing small local public transport modes such as Songthaews and Kapor buses.
- Review existing studies focusing on the operation and services of paratransit and local public transport serving as feeder services.



- **Station areas**
 - TOD
 - Railway ridership
- **Operation and services**
 - Routes, service areas & fares
 - Vehicle fleets, drivers pull
 - Terminal and stop locations
 - Timetables where available
- **Driver Interview**
 - Socioeconomic
 - Operation & perception
 - Improvement packages
- **Passenger Interview**
 - Service satisfaction

Meeting with ATRANS & IATSS Advisors in Bangkok

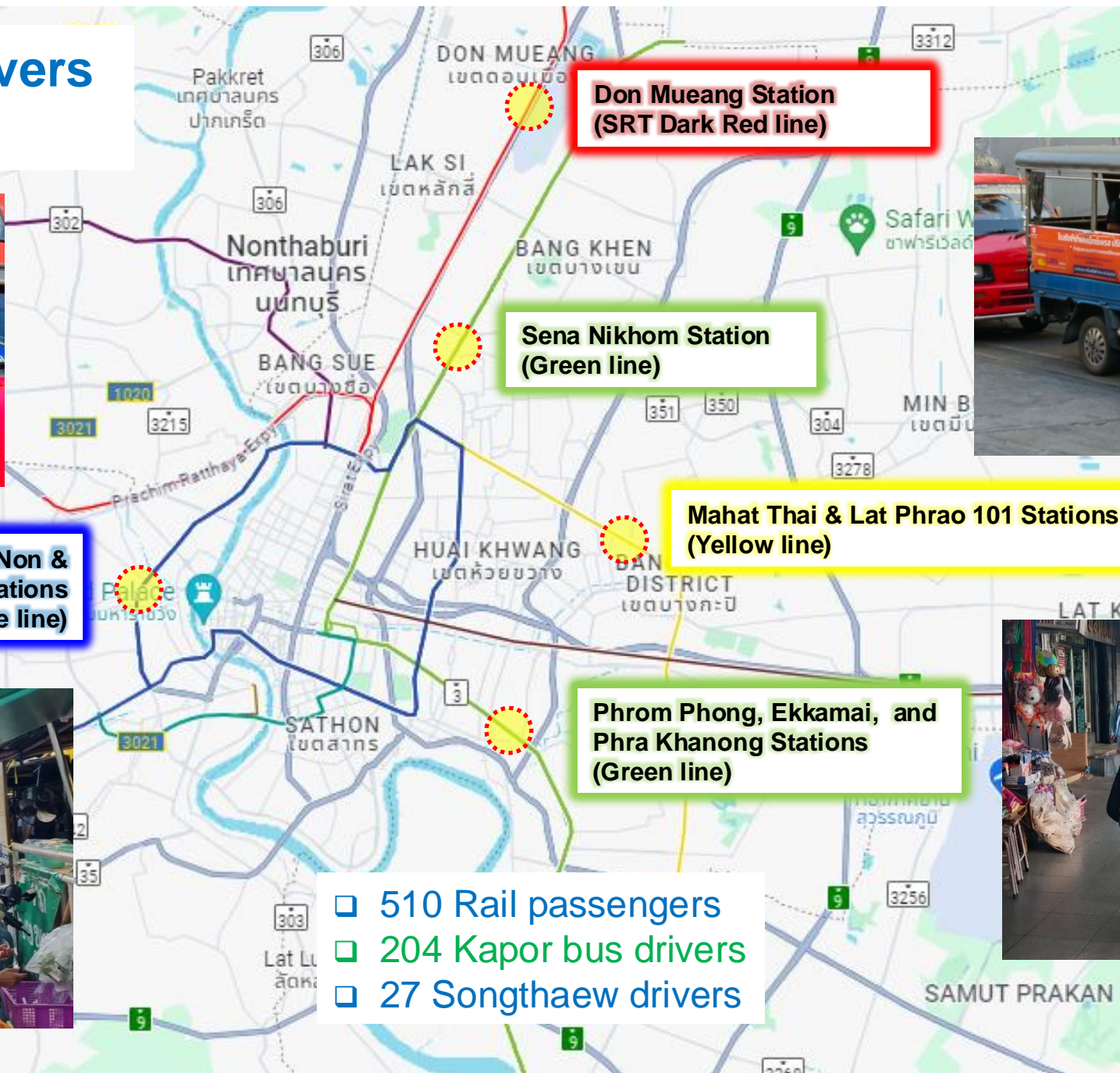


November 5th, 2024

Passengers & Drivers Interview Surveys



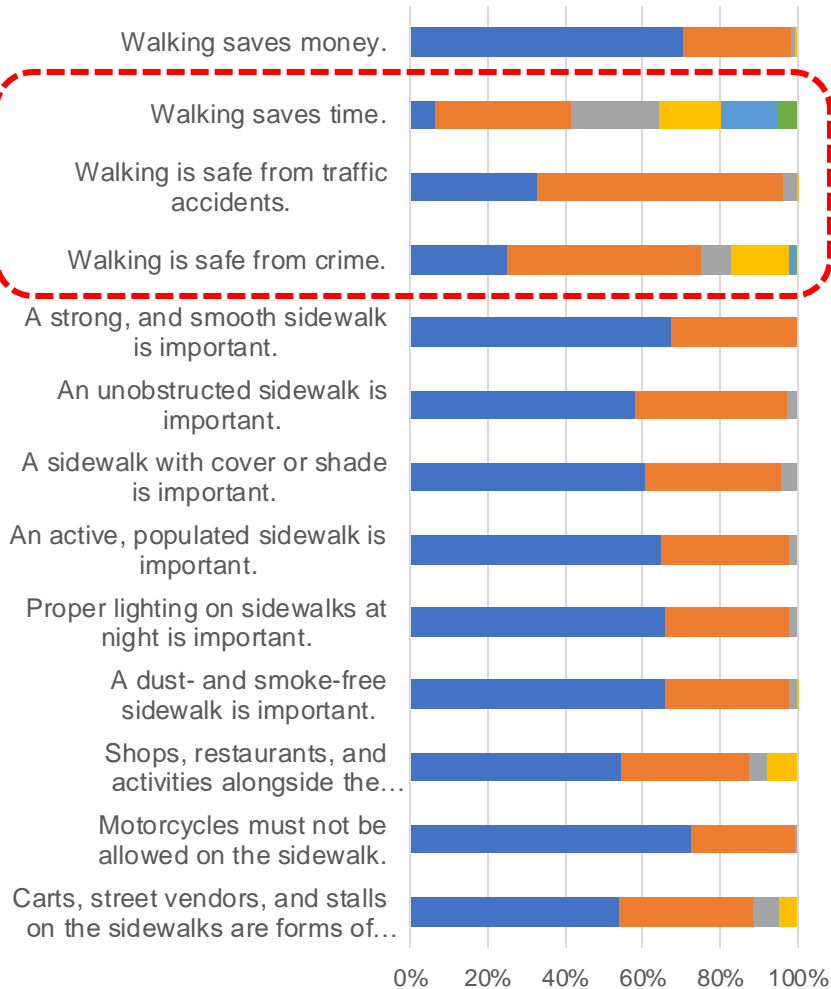
**Bang Khun Non & Charan 13 Stations
(MRT Blue line)**



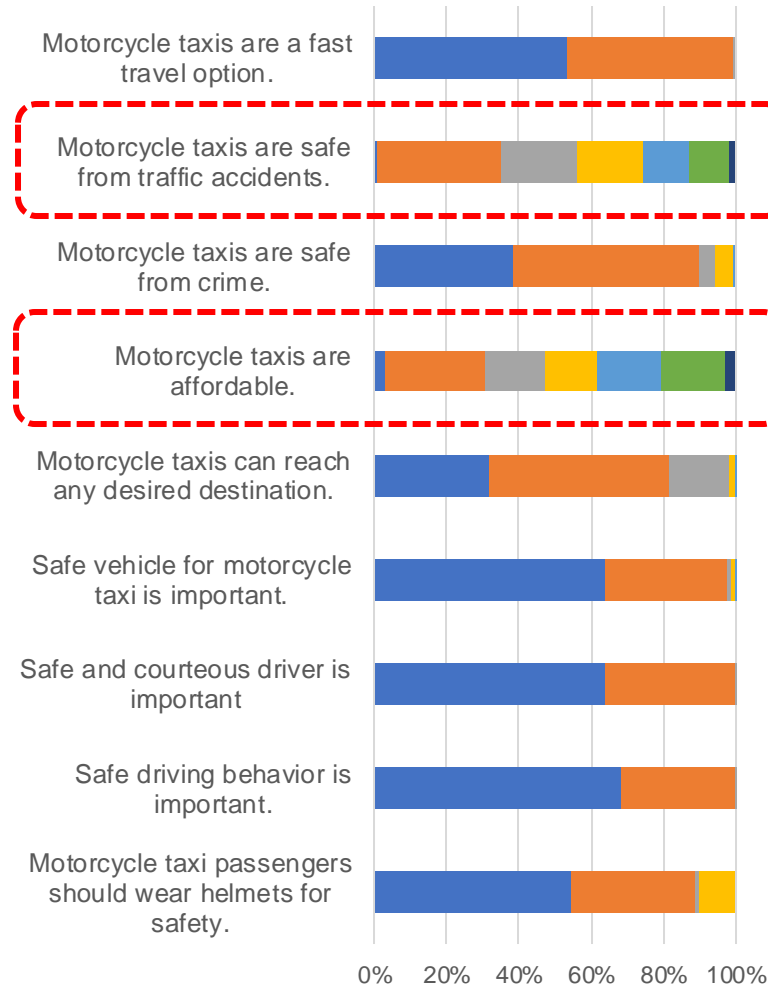
- 510 Rail passengers
- 204 Kapor bus drivers
- 27 Songthaew drivers

Rail Passengers' Perceptions

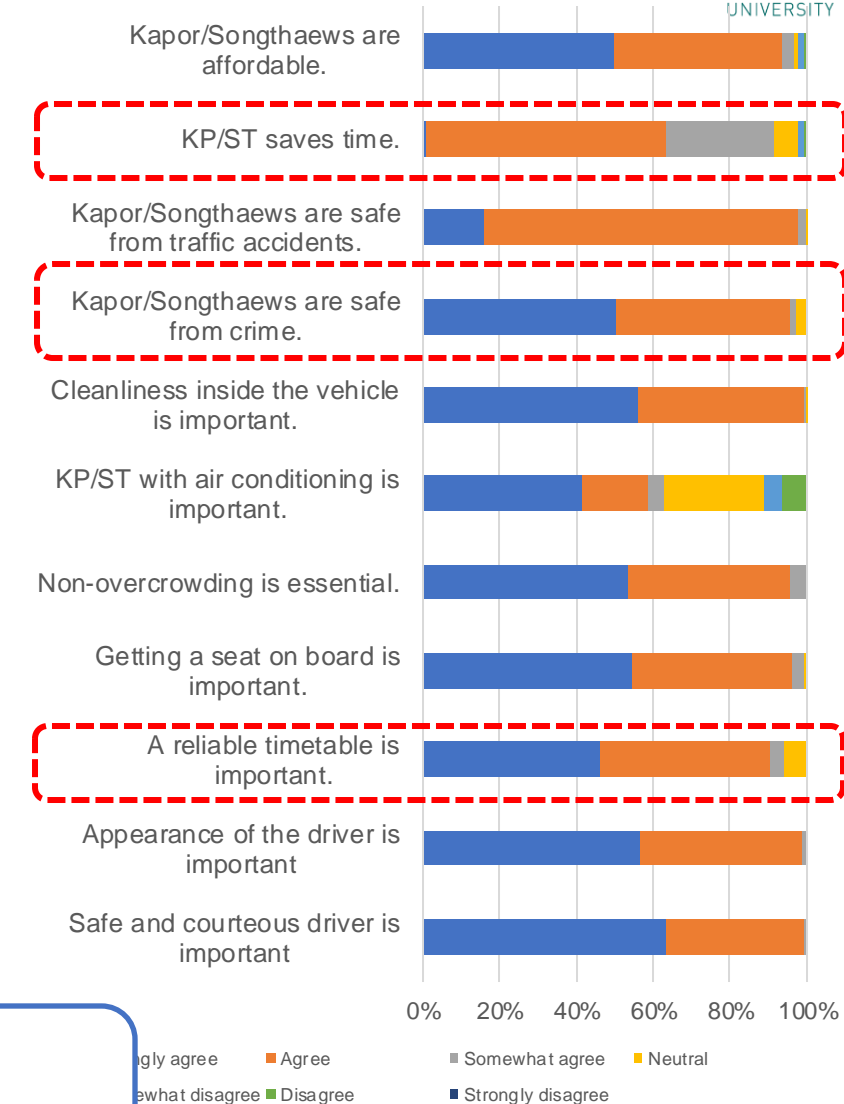
Walking



Motorcycle Taxi



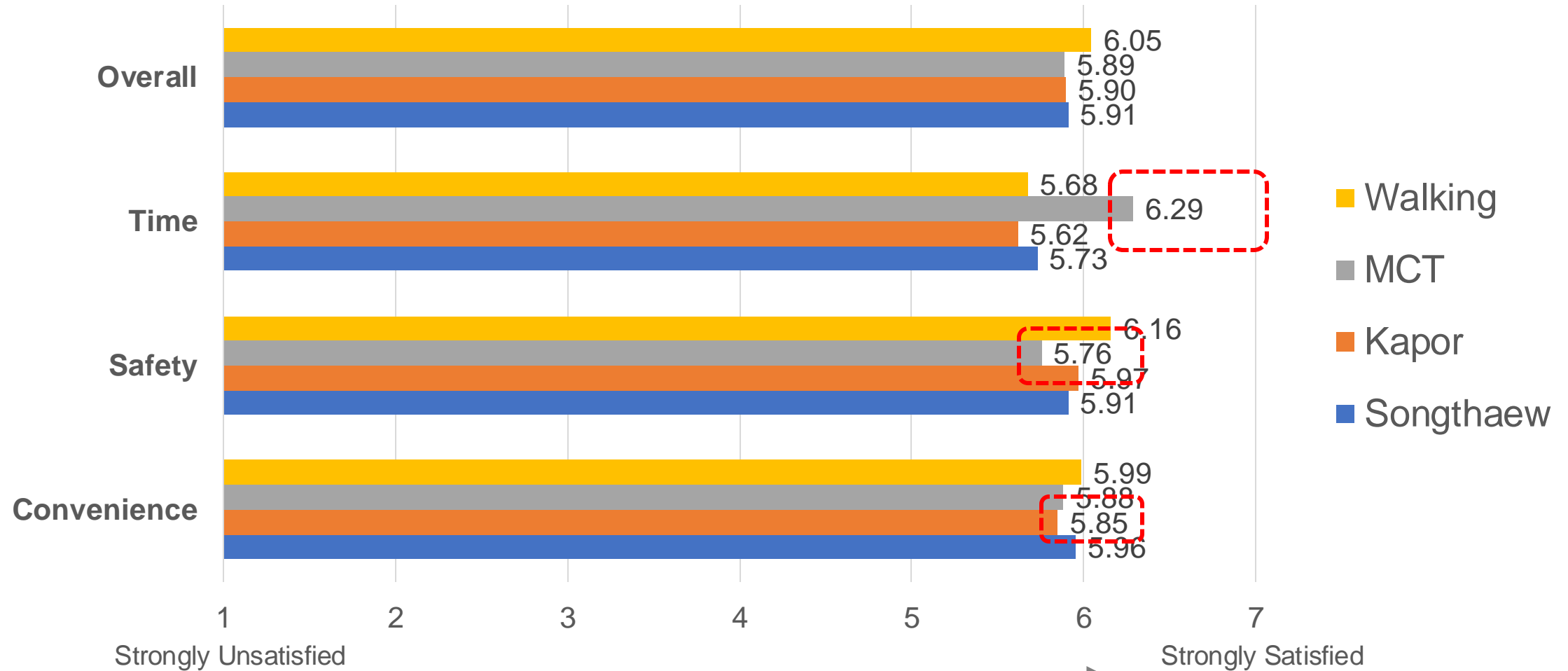
Kapor/Songthaew



- ☐ **Walking** is time-consuming and not very safe due to the risk of crime.
- ☐ **Motorcycle taxis** are dangerous and expensive.
- ☐ **Kapor** and **Songthaew** buses are safe but not reliable in terms of schedule.

(N=510)

Passengers' Satisfaction



- ❑ **Walking** has the highest satisfaction and safety.
- ❑ **Motorcycle taxi** is the most time-efficient but riskiest.
- ❑ **Kapor buses** are the least convenient.

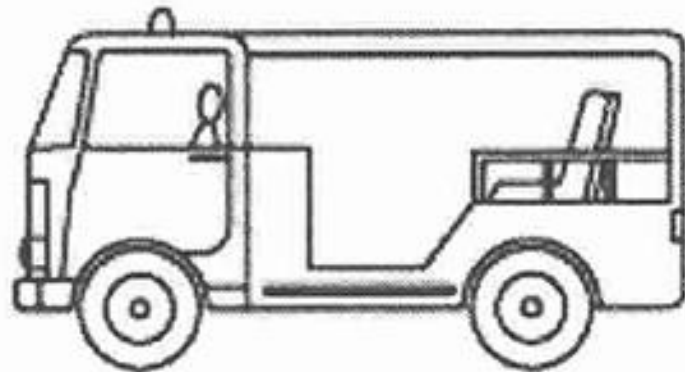
Kapor Buses (or Silor-Lek) in Bangkok

6 operator licenses

124 routes

1,377 individual owners

“Independent individual owner operators”



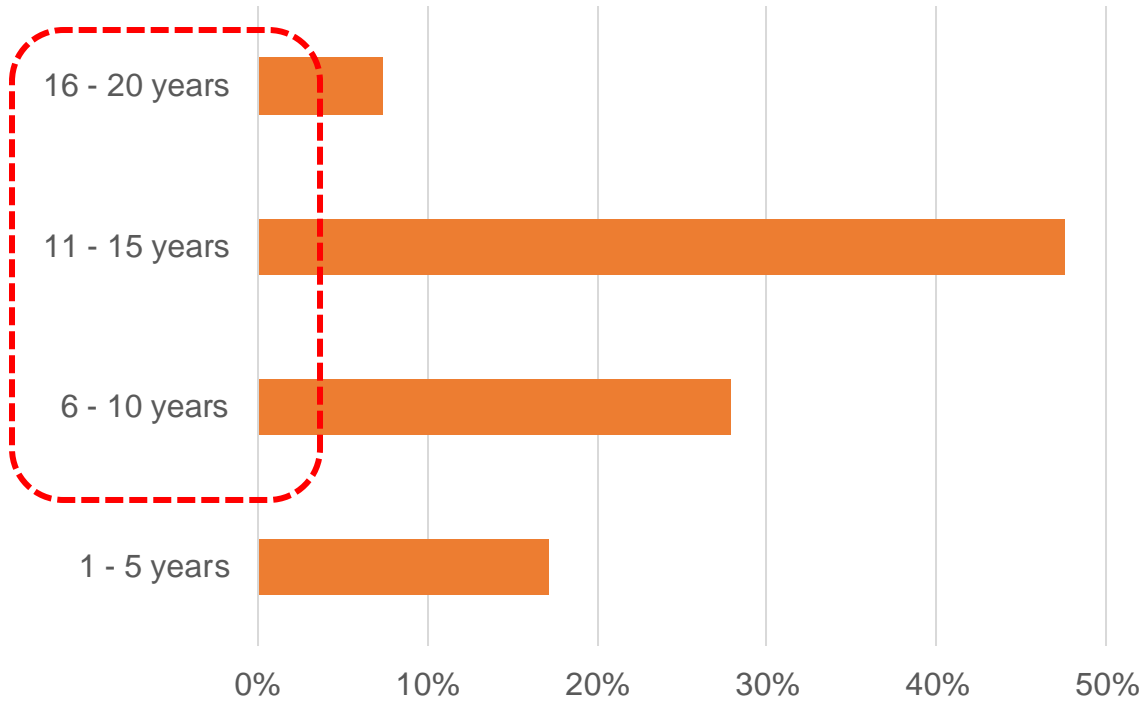
Motor Vehicle Act
Vehicle Type 7

“Four-wheel commercial vehicle”



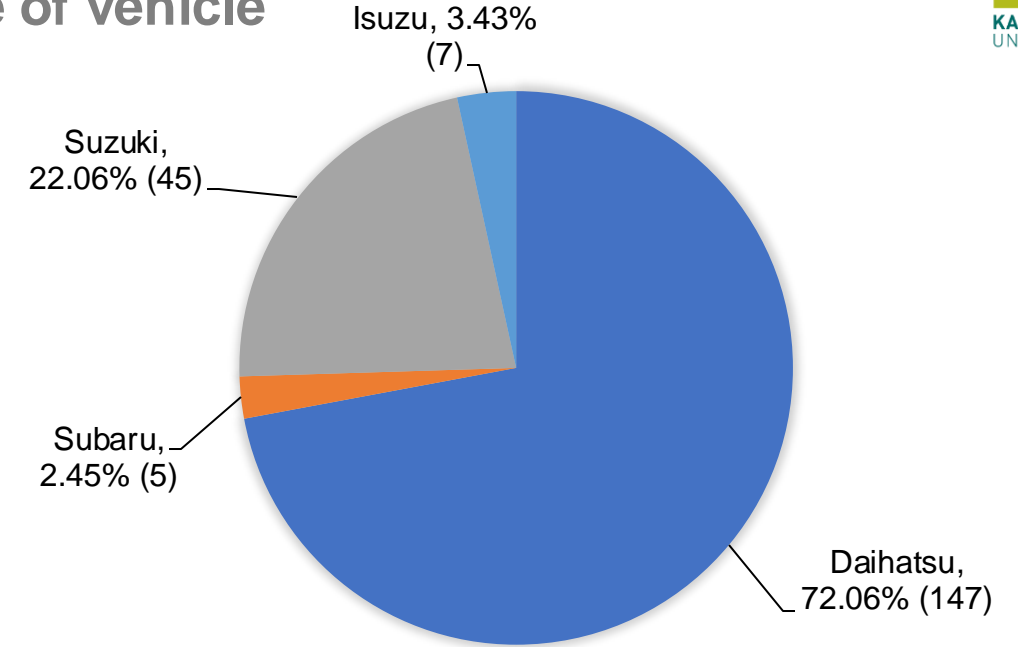
Kapor Bus Vehicles

Age of vehicle

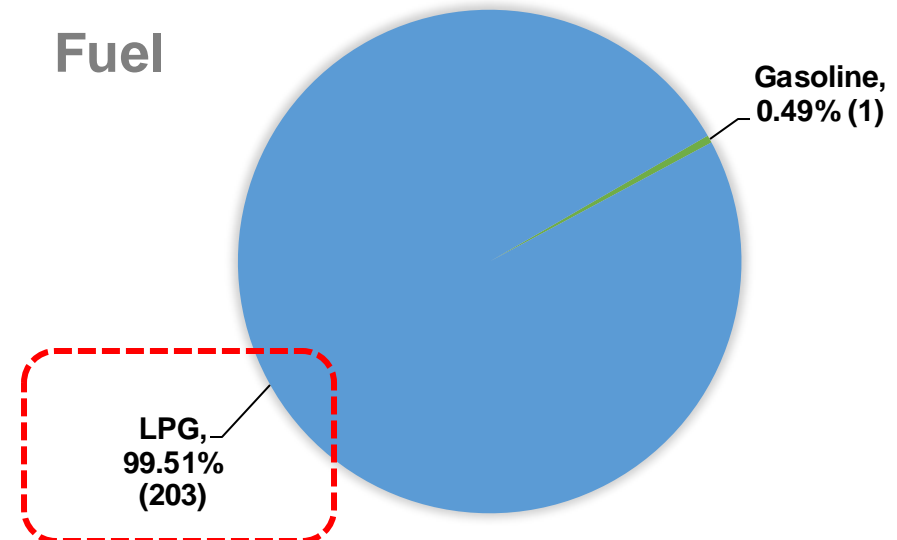


Kapor buses are mostly old, running on LPG.

Make of vehicle



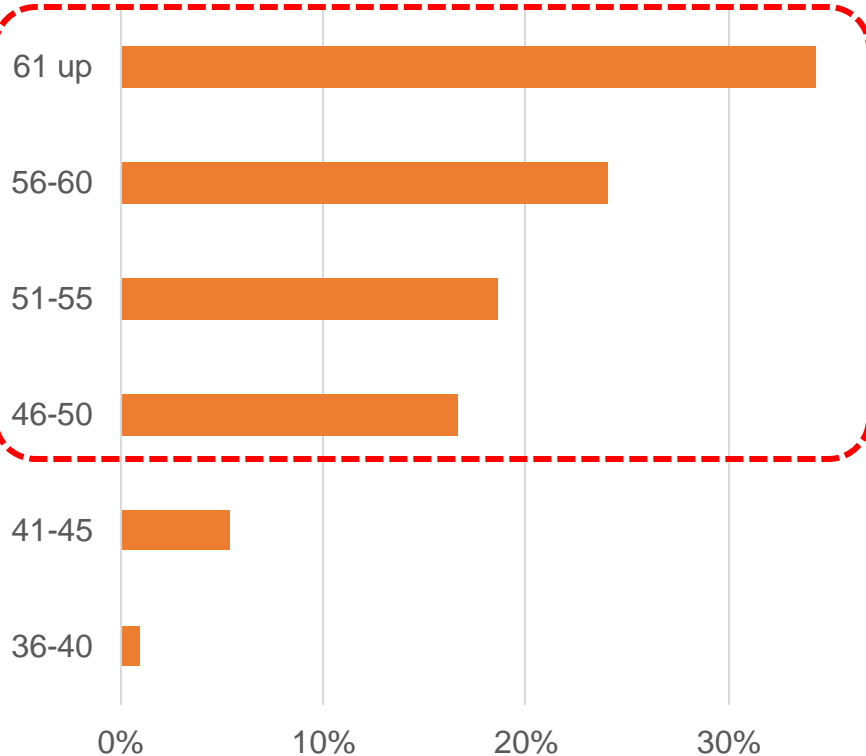
Fuel



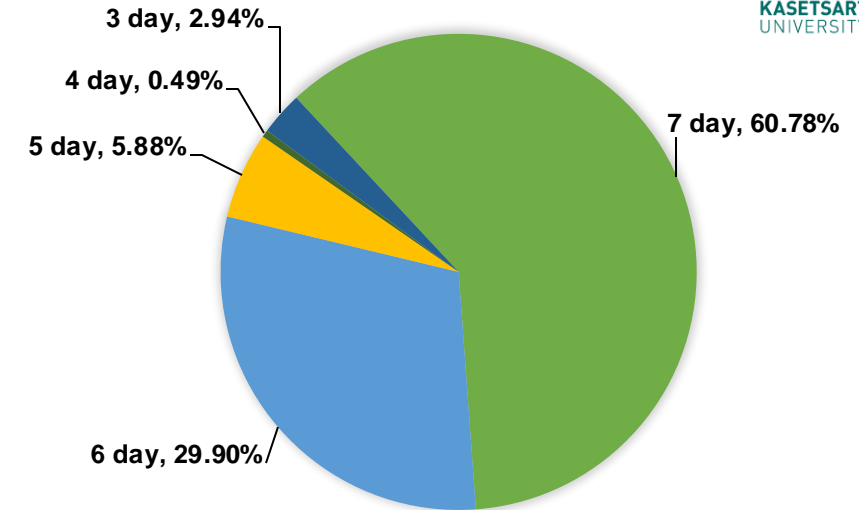
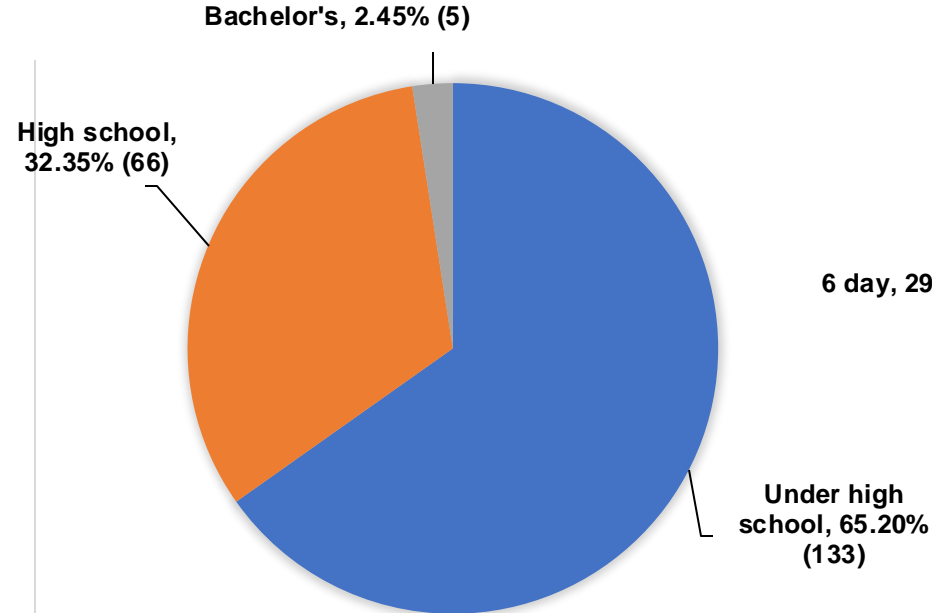
Kapor Bus Drivers

Number of days driving per week

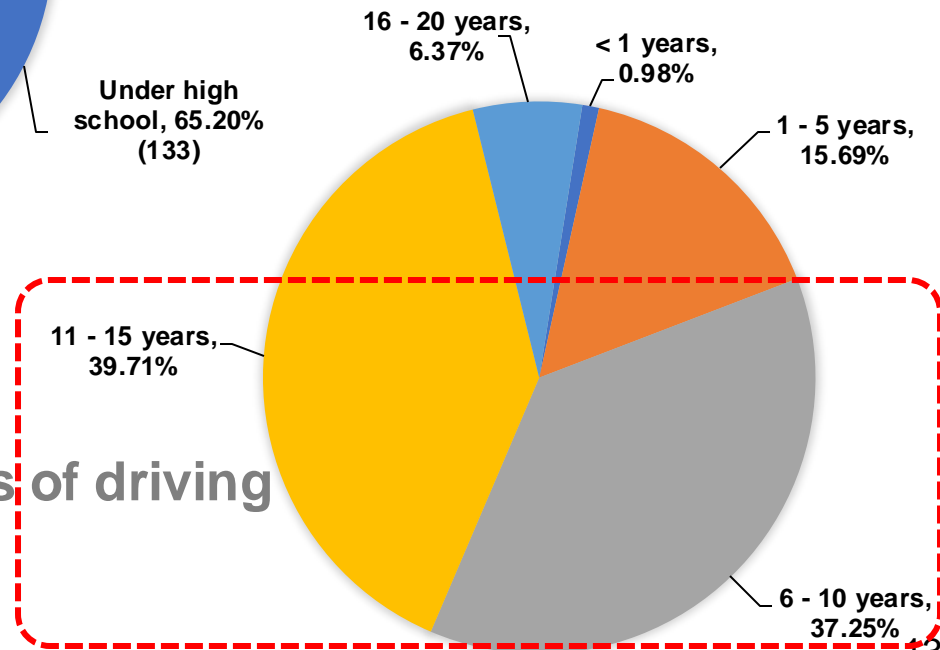
Age



Education



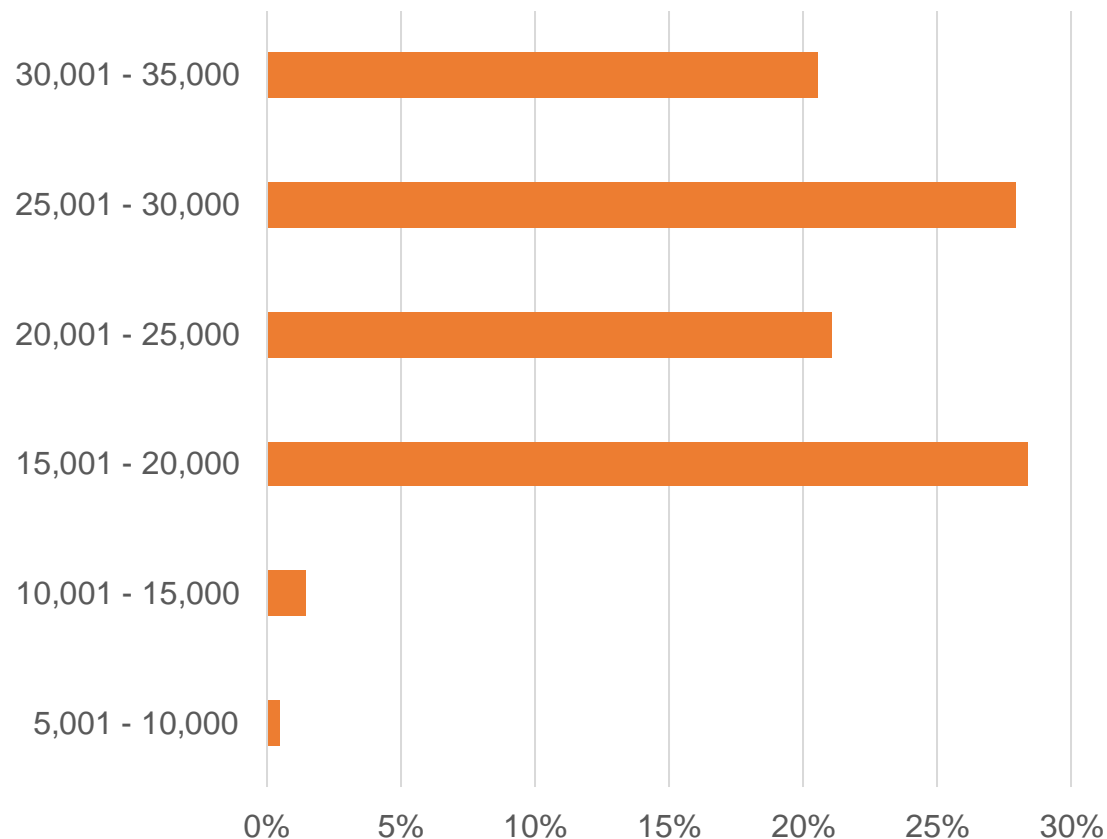
Number of years of driving



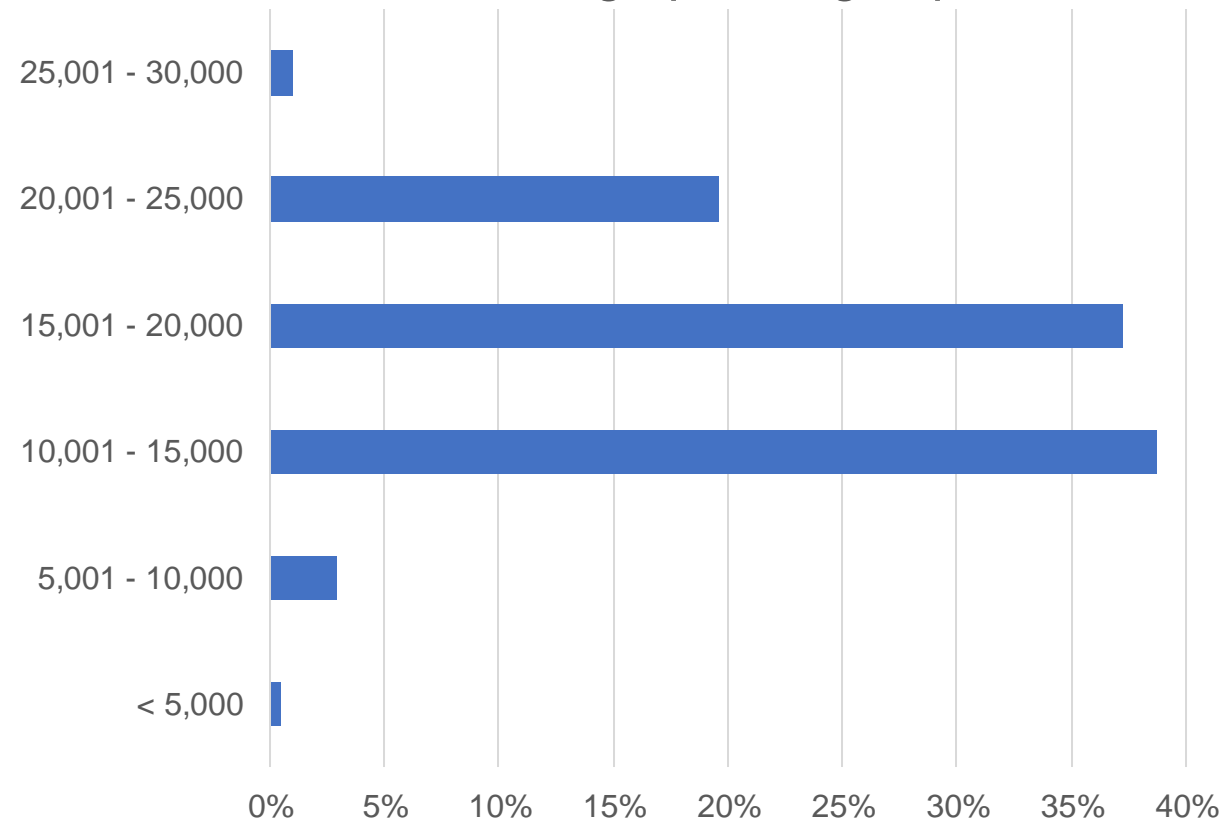
Kapor bus drivers are mostly older individuals, driving as their main job.

Kapor Bus Drivers' Income

Gross Income



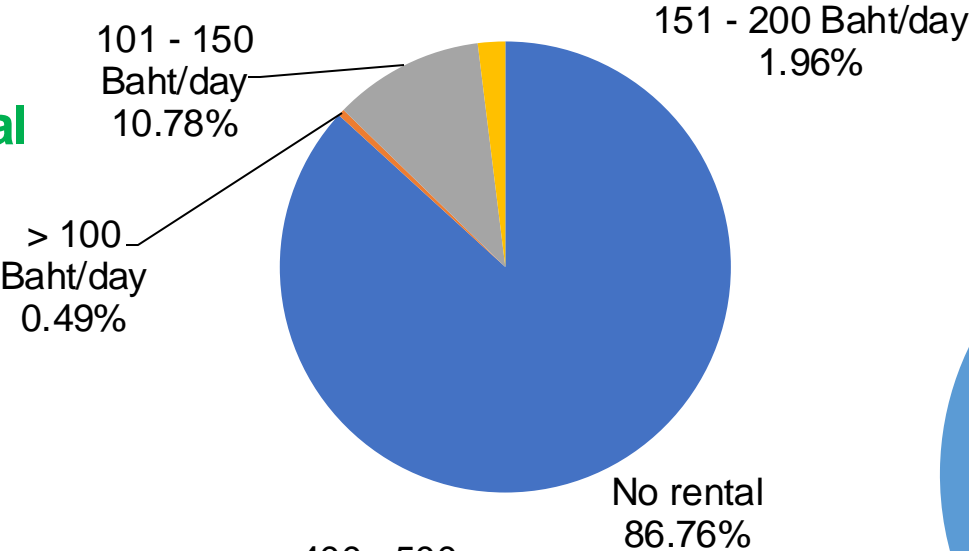
Net Earning
after deducting operating expenses



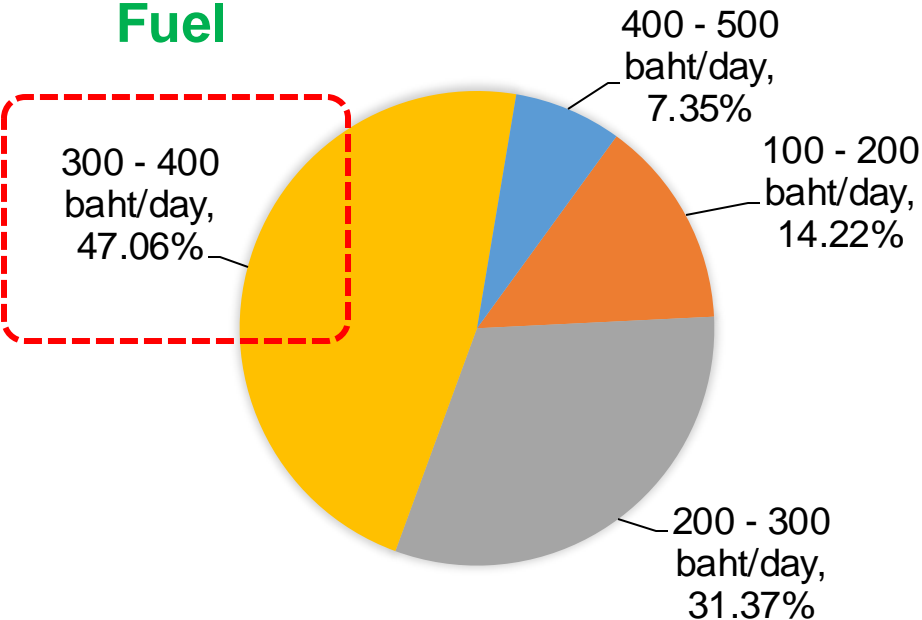
Kapor drivers' net income is not high, just enough for daily living, so not financially secured.

Kapor Bus Operating Expenses

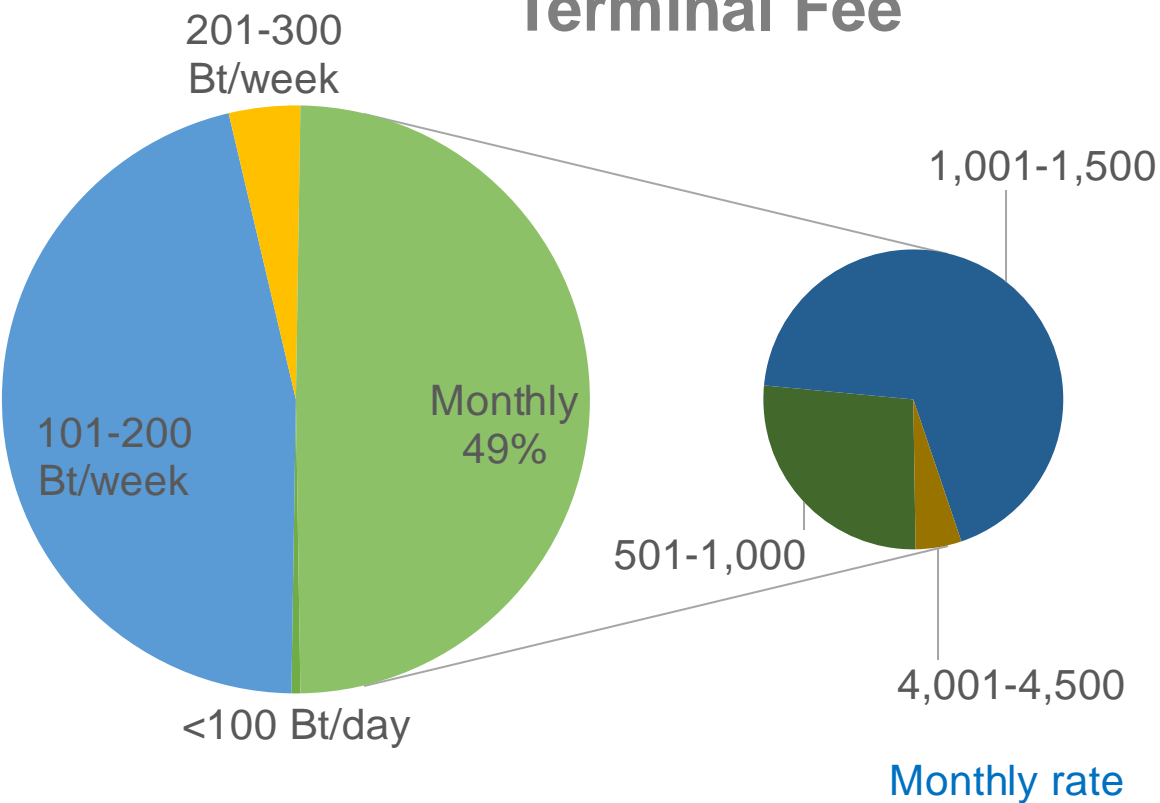
Vehicle Rental



Fuel

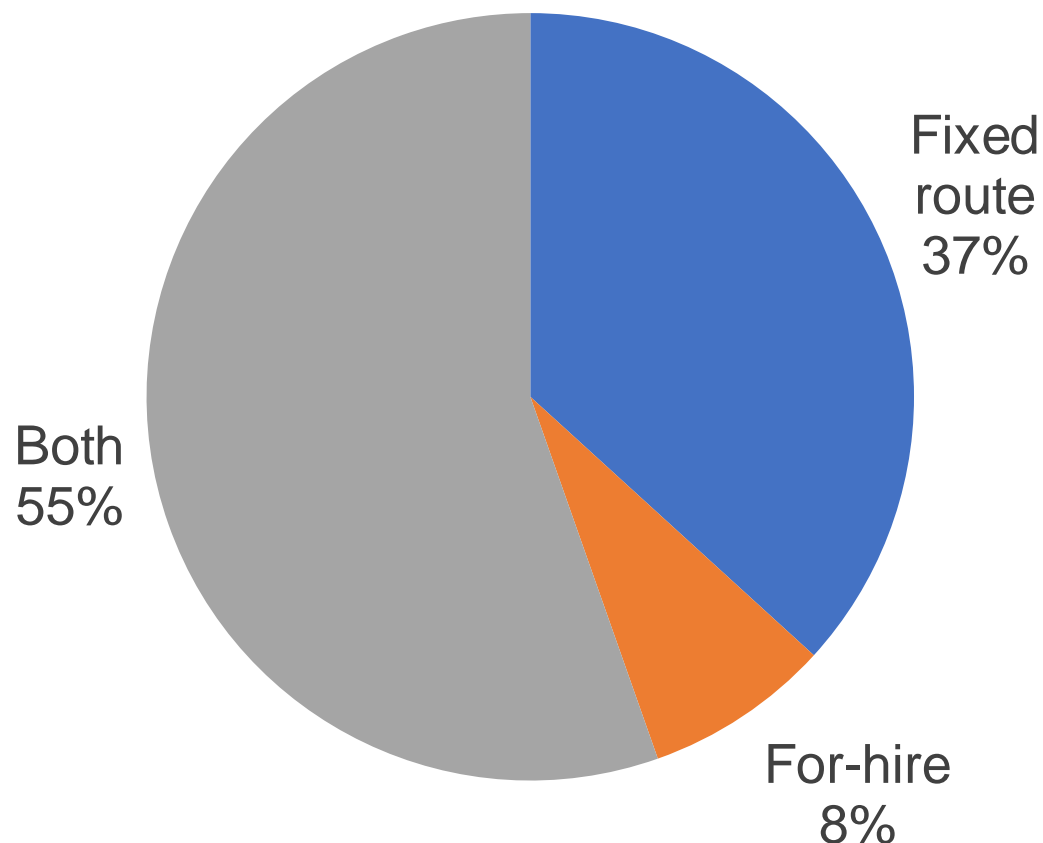


Terminal Fee



High operating costs
15,000 for fuel
1,500 for terminal

Two Types of Kapor Bus Operations



❖ Fixed-route (As a bus)

- Two-way operation
- Fixed departure schedule
- Fixed, flat fare (cheap)
- Carries 5–6 passengers

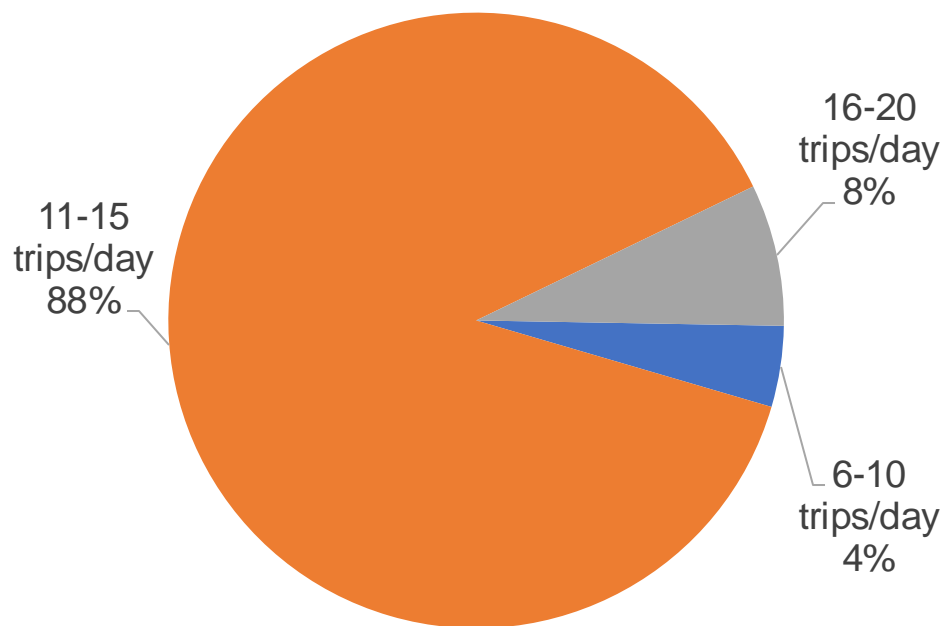
❖ For hire (As a taxi)

- One-way operation
- Higher fare to cover the empty backhaul

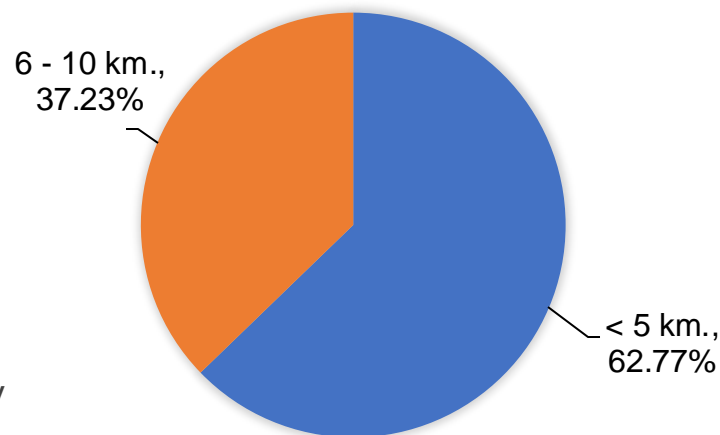
Many of Kapor buses operate in **dual modes**, switching between fixed-route and for-hire services based on demand.

Fixed-Route Operations

Number of trips per day



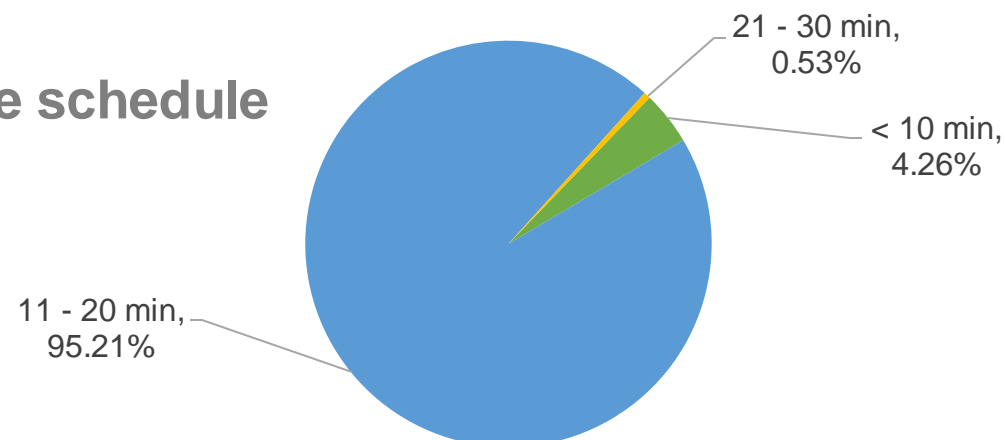
One-Way Distance



Fare per person



Departure schedule



For a typical **13 daily operations** with **5 passengers** and a **10 Baht fare**, the average income is **650 Baht/day** or approximately **19,500 Baht/month**.

Sena Nikhom station (Green line)

BTS Sena Nikhom station – Wang Hin
Distance: 6.2 km.
Time: 17 min
Fare: 10 baht
Income/trip: 51 - 60 baht

BTS Sena Nikhom station - Lat Pla Khao
Distance: 3.3 km.
Time: 7 min
Fare: 10 baht
Income/trip: 51 - 60 baht

MRT Chokchai 4 Station - BTS Sena Nikhom station
Distance: 7.2 km.
Time: 18 min
Fare: 10 baht
Income/trip: 71 - 80 baht

MRT Chokchai 4 Station – Lotus Wang Hin
Distance: 4.1 km.
Time: 12 min
Fare: 10 baht
Income/trip: 51 - 60 baht

MRT Lat Phrao 101 Station – Bunraksa (Nawamin 74)
Distance: 7 km.
Time: 16 min
Fare: 10 baht
Income/trip: 71 - 80 baht

10 Baht flat-fare
3.5–7 km distance
7–18 minutes travel time
50–80 Baht income per trip

MRT Mahat Thai Station – Ramkhamhaeng 65
Distance: 2 km.
Time: 7 min
Fare: 10 baht
Income/trip: 51 - 60 baht

**Mahat Thai and
Lat Phrao 101 station
(Yellow line)**

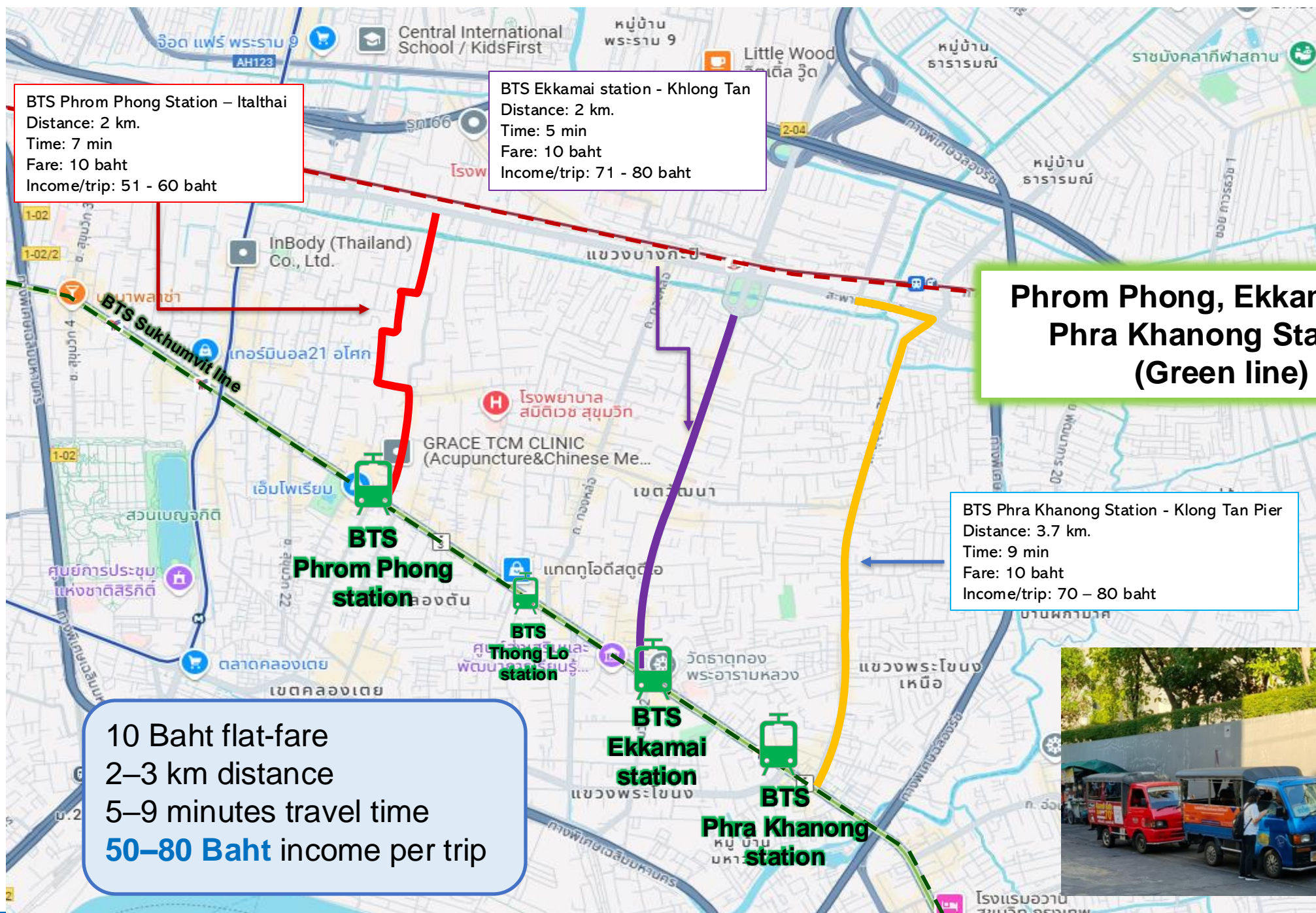


Siriraj – Chao Phraya
Distance: 4.4 km.
Time: 12 min
Fare: 10 baht
Income/trip: 61 - 70 baht

10 Baht flat-fare
4.5–9 km distance
7–18 minutes travel time
60–80 Baht income per trip

MRT Charan 13 Station – Khlong San
Distance: 9 km.
Time: 19 min
Fare: 10 baht
Income/trip: 71 – 80 baht





Don Mueang station (Dark Red line)

Don Mueang - Wat Nawong
Distance: 8.4 km.
Time: 14 min
Fare: 10 baht
Income/trip: 201 – 300 baht

Don Mueang – Tiwanon
Distance: 8.8 km.
Time: 14 min
Fare: 10 baht
Income/trip: 201 – 300 baht

Don Mueang - Wat Phai Khiao
Distance: 8 km.
Time: 14 min
Fare: 10 baht
Income/trip: 201 – 300 baht

BTS
Don Mueang station

BTS Sukhumvit line

BTS
Saphan Mai station

SRT / MRT
Laksi station

BTS / MRT
Wat Phra Sri Mahathat station

Ying Charoen Market-Ramindra Km.2
Distance: 8 km.
Time: 14 min
Fare: 10 baht
Income/trip: 201 – 300 baht

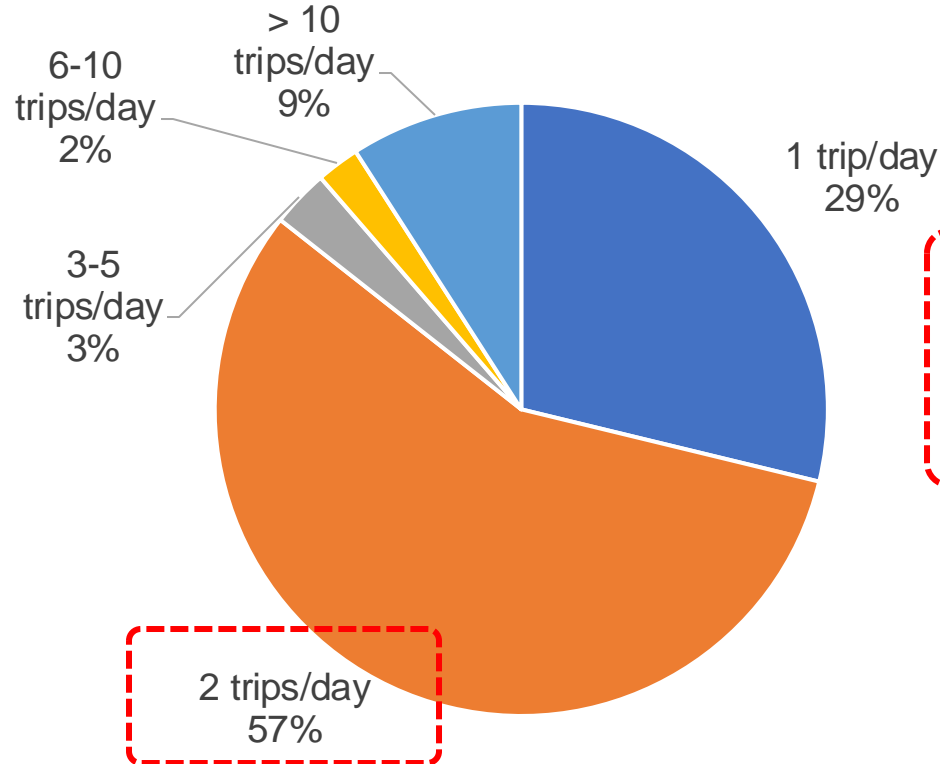


Sonthaew Bus
10 Baht flat-fare
8–8.5 km distance
14–20 minutes travel time
200–300 Baht income per trip

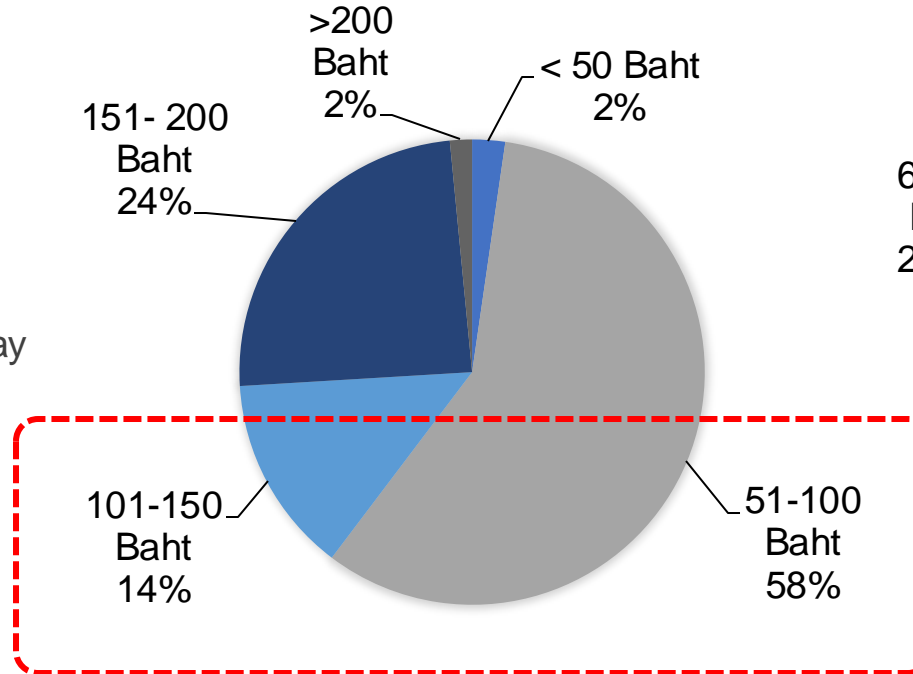


For-Hire Operations

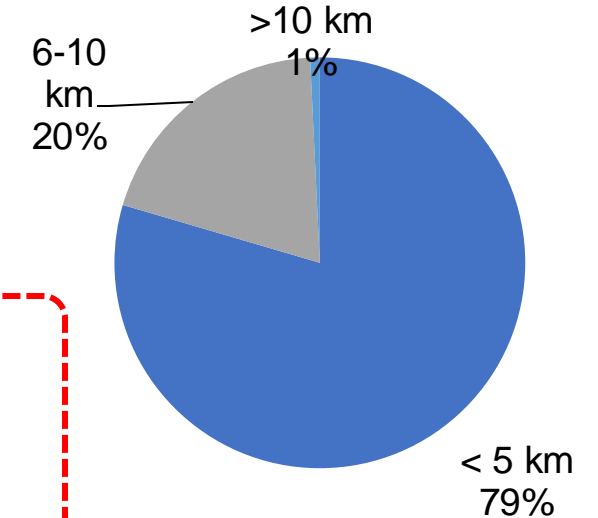
Number of trips per day



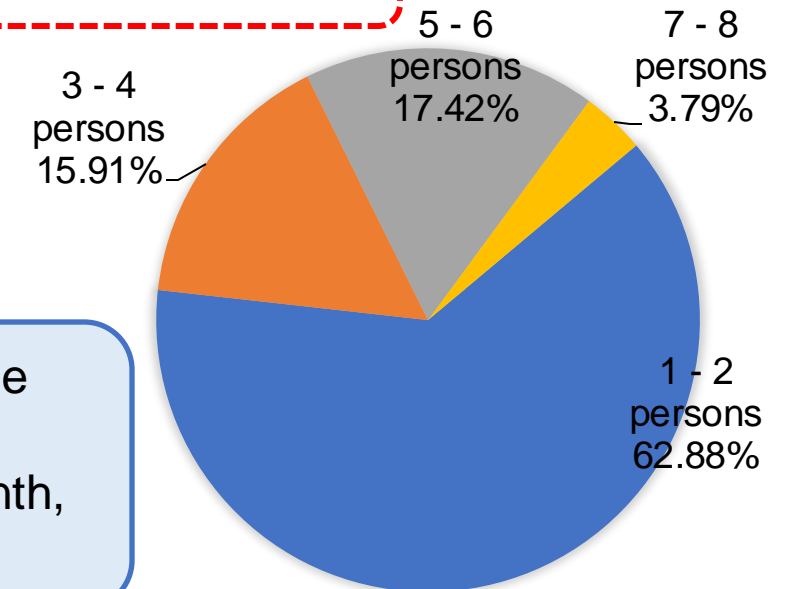
Fare



Distance

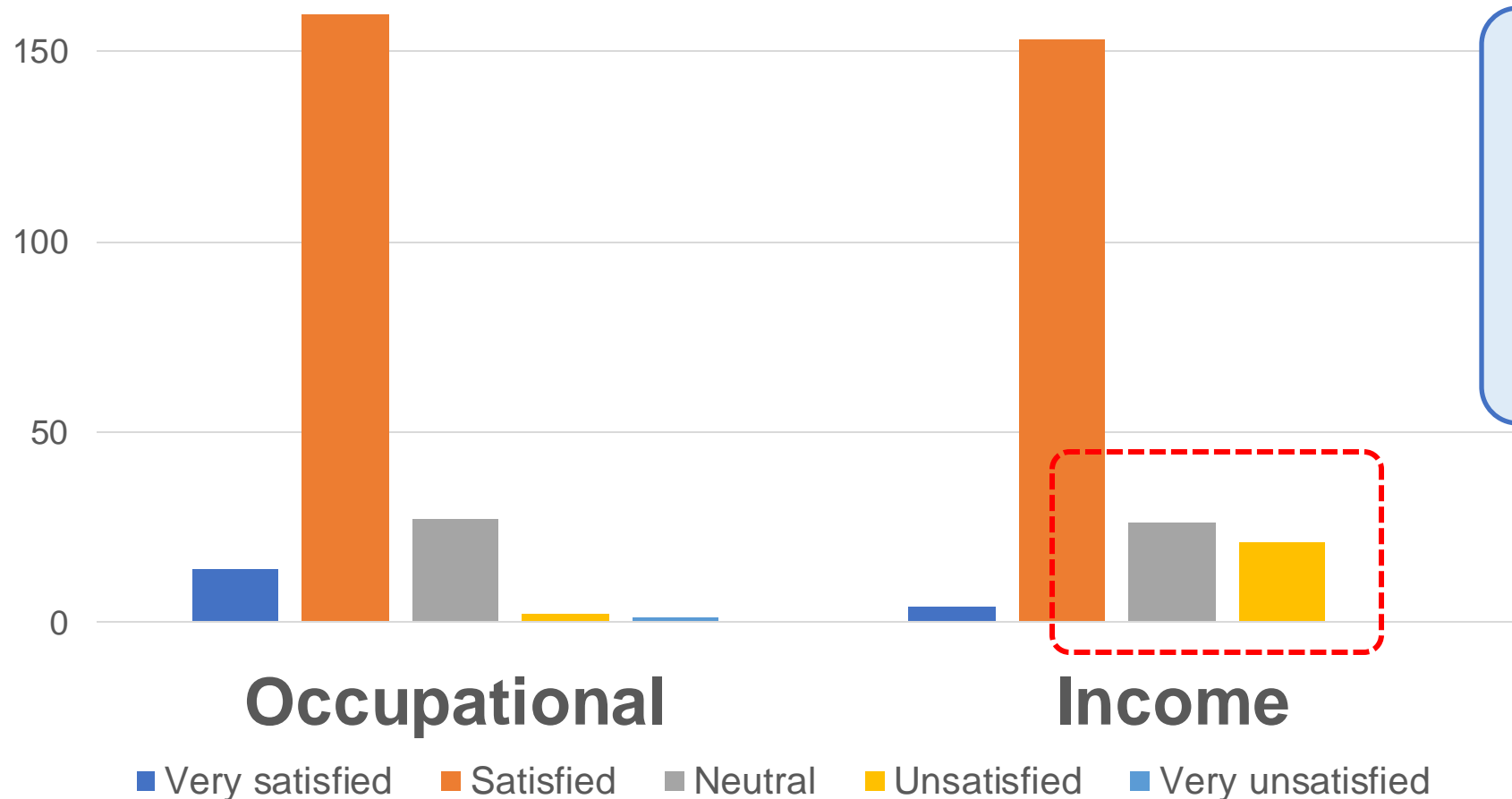


Number of passengers



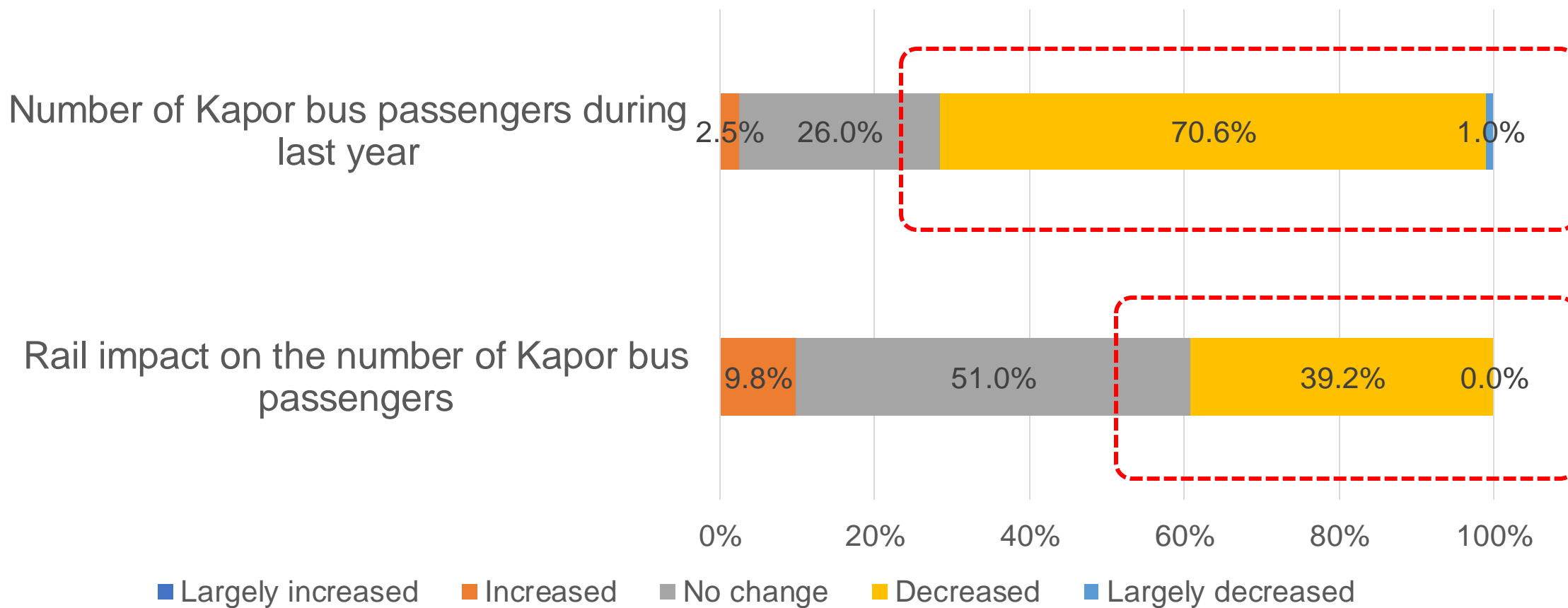
- For a typical 2 for-hire trips per day with a 100 Baht fare, the average income is 400 Baht/day or approximately **12,000 Baht/month**.
- Combined with the fixed-route operation income of 19,500 Baht/month, the total income amounts to over **31,500 Baht/month**.

Satisfaction as a Kapor Bus Driver



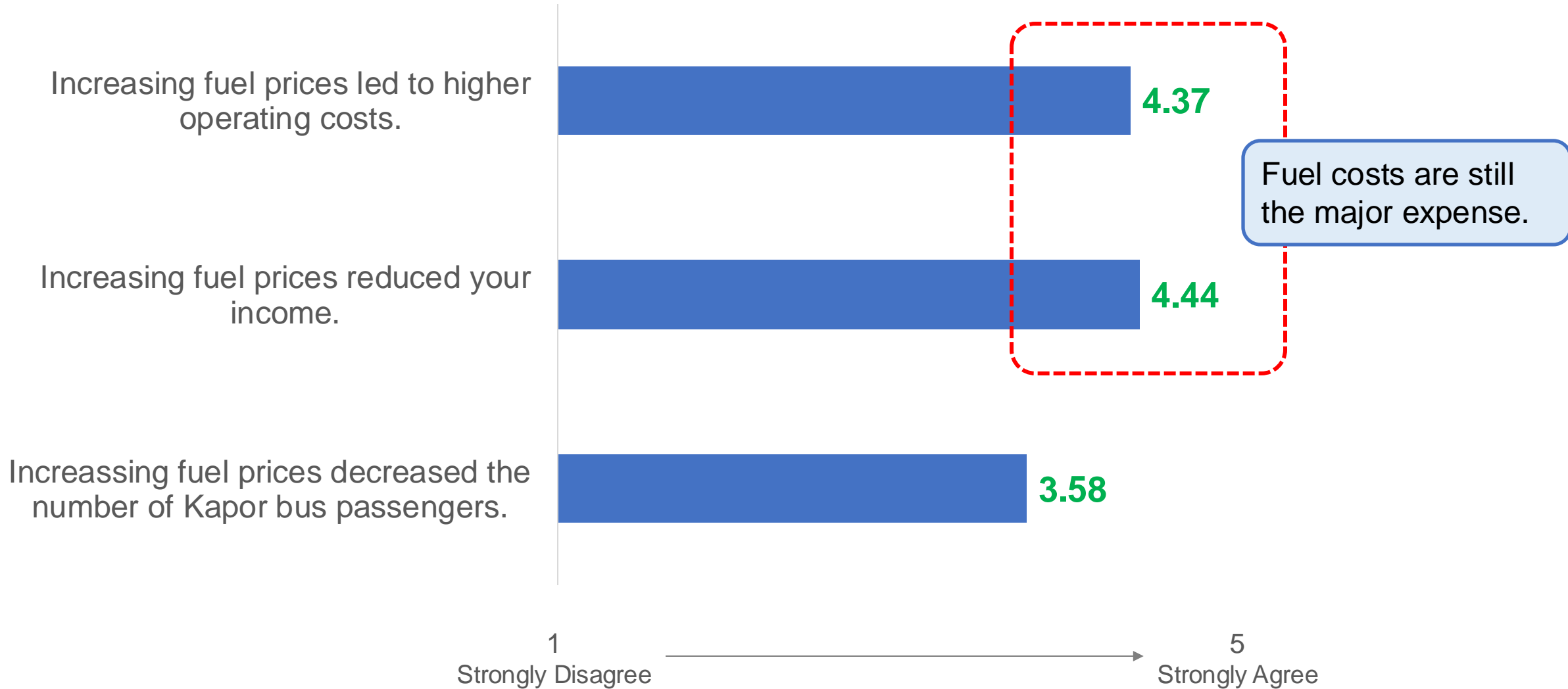
- Majority of drivers are **satisfied** with their occupation.
- However, many are **dissatisfied** with their earnings.

Trends of Kapor Bus Ridership



Kapor bus ridership is declining, but not due to the opening of railway services.

Impact of Fuel Price



Complementing / Substituting Modes

Motorcycle taxis decreased the number of Kapor bus passengers.

4.17

Motorcycle taxis are a competing mode.

Ride-sourcing apps reduced the number of Kapor bus passengers.



4.09

Ride-hailing services are emerging.

Muvmi (shared e-TukTuk) reduced the number of Kapor bus passengers.

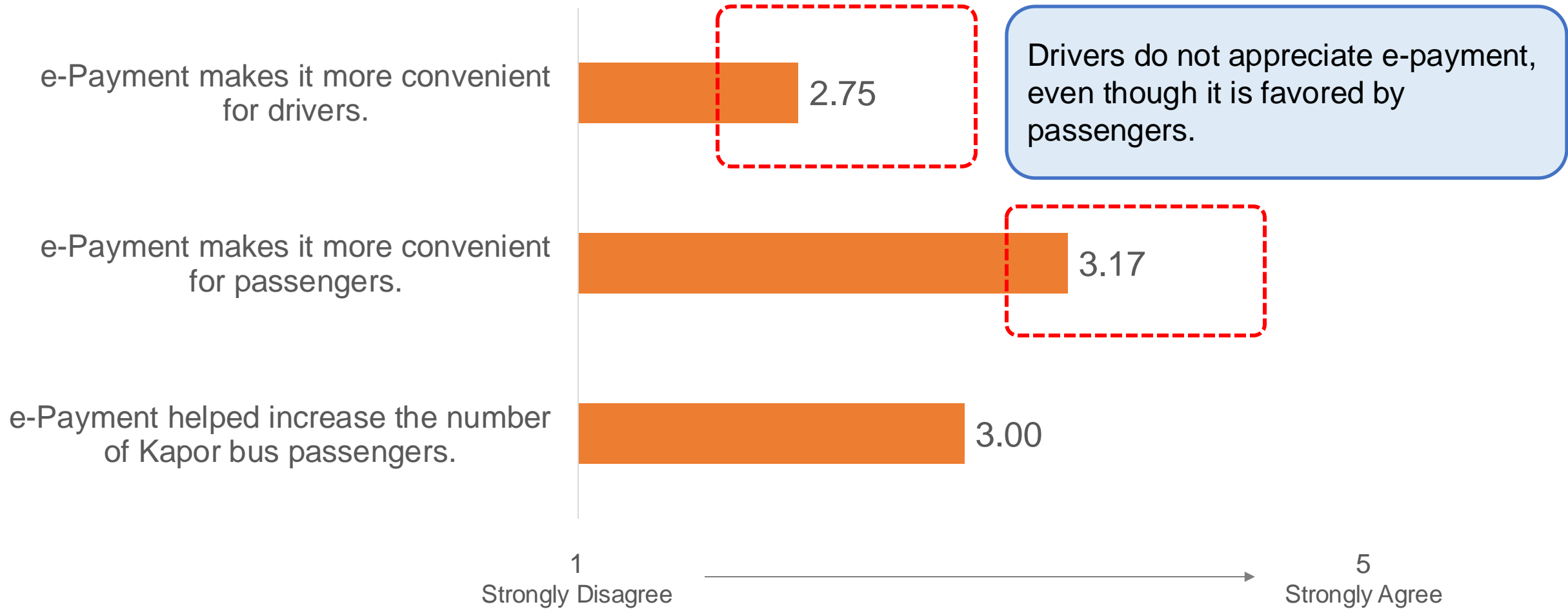
3.78

A modern mode like Muvmi likely caters to a different market.

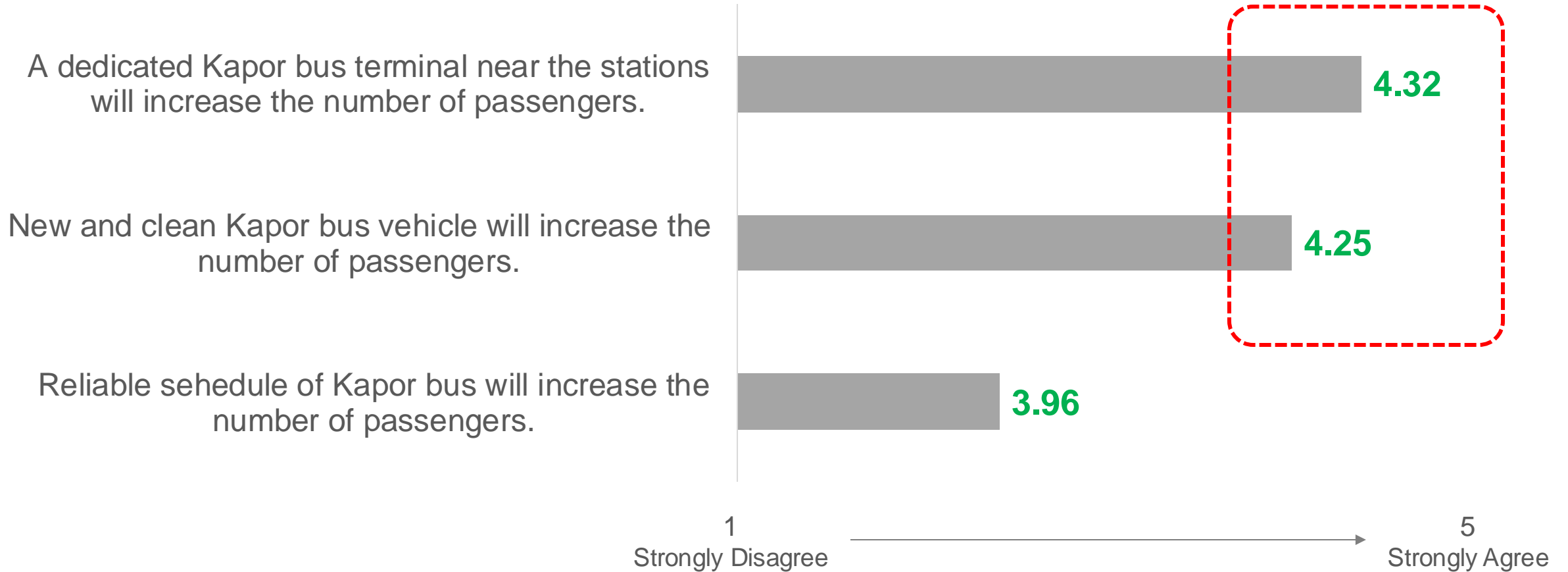


1 Strongly Disagree ————— 5 Strongly Agree

e-Payment



Kapor Bus Improvements



Kapor buses need improvements in **vehicles** and stop facilities.

Enhanced Kapor Bus

<<< Modernizing Urban Mobility <<<

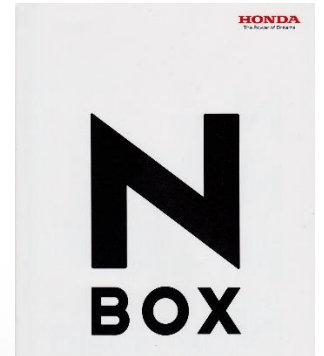


imagine



Source: Honda

- Safety standard
- Passenger convenience
- Low energy & emission
- **Mobility as a Service**



Package A – Independent Owner Operator

Vehicle

- Government subsidized, own after payment completion
- Hire purchase payment: **3,800 Baht/month × 7 years**
- **Cannot be sold or transferred before 7 years**

Operation

- No obligation of minimum service hours or routes

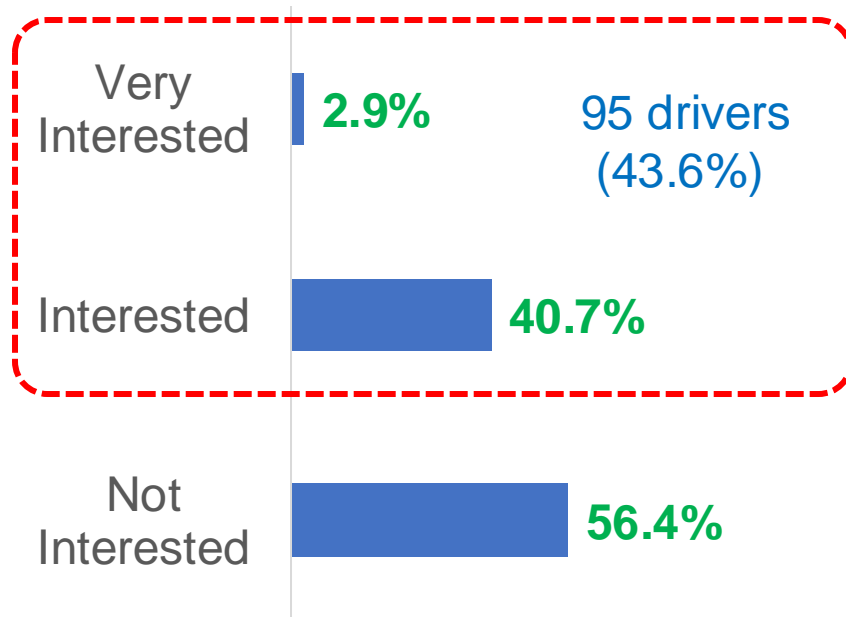
Passenger trends

- **Present trend of number of Kapor passengers**
- No significant expected growth or decline in ridership

Income

- **Present trend of income**
- No anticipated improvement

Drivers' responses to A



Package B – Smart Owner Operator

Vehicle

- Government subsidized, own after payment completion
- Hire purchase payment: **4,000 Baht/month** × 7 years
- **Cannot sell or transfer before 7 years**

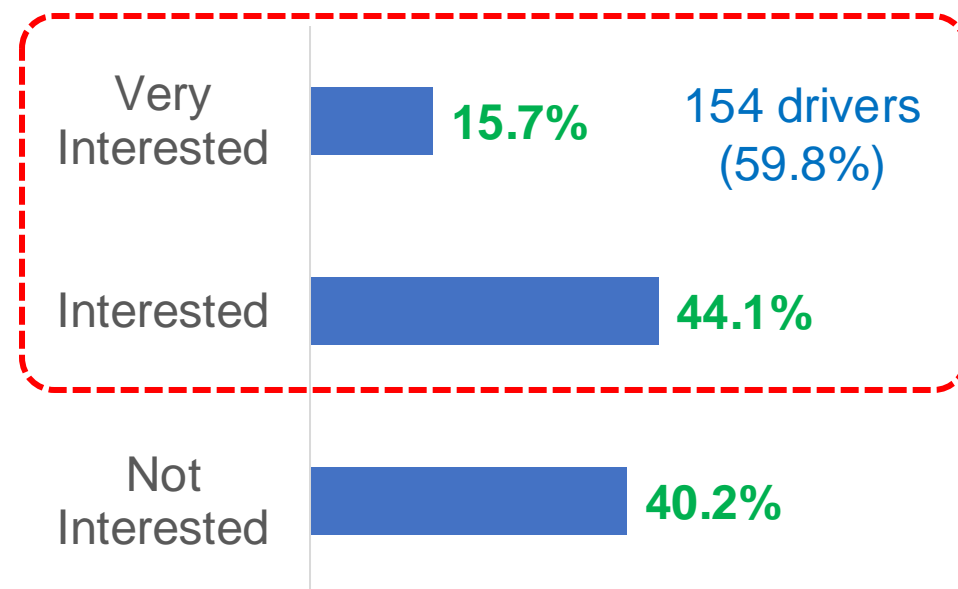
Ride-sourcing app

- **Mandatory participation**
- Passenger booking, e-payment, vehicle tracking
- **Follow assignment for optimal operation** (e.g., routes, ride, schedules)

Income

- **Potential for increased income** due to higher passenger demand and streamlined operations.

Drivers' responses to B



Package C – Flexible Rental Operator

Vehicle

- Private company **vehicle rental**, no ownership
- Road worthiness guarantee, vehicle change on call
- Rental fee: **3,500 Baht/month**

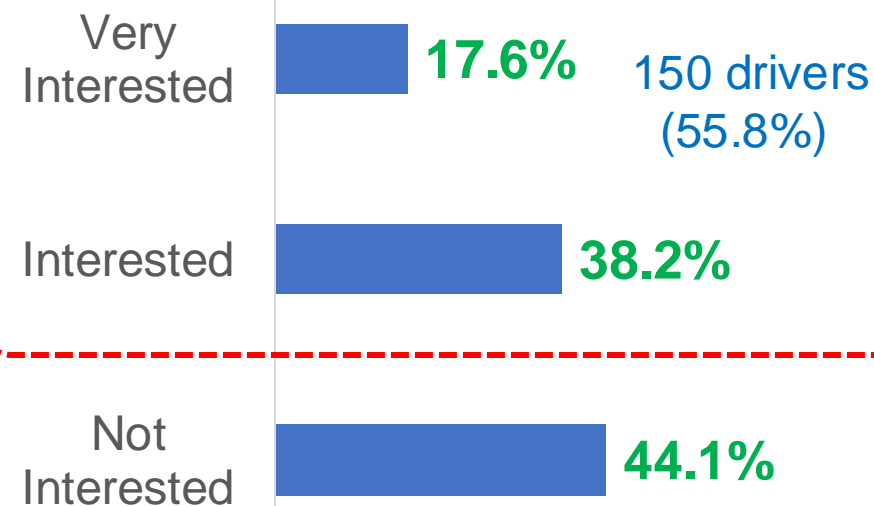
Ride-sourcing app

- Mandatory participation
- Passenger booking, e-payment, vehicle tracking
- Follow assignment for optimal operation (e.g., routes, ride, schedules)

Income

- Potential for increased income due to higher passenger demand and streamlined operations.

Drivers' responses to C



Package D – Professional Driver

Vehicle & driver

- Company owned vehicle
- Driver as an employee with agreed working conditions

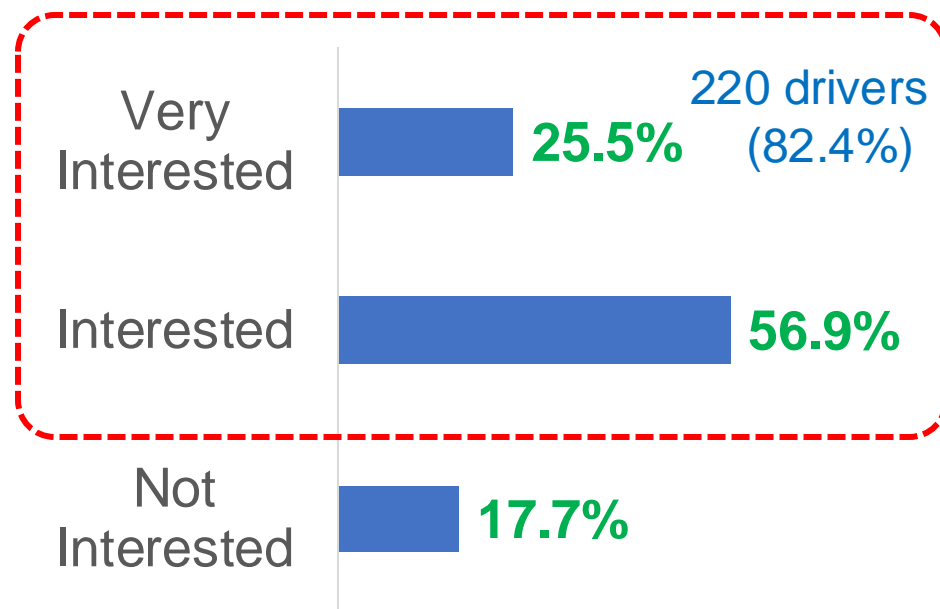
Operation & service

- Follow the company assignment for optimal operations (e.g., routes, ride, schedules)
- App for passenger booking, e-payment, vehicle tracking, etc.

Income & benefit

- Salary 18,000 Baht + bonus
- Social security

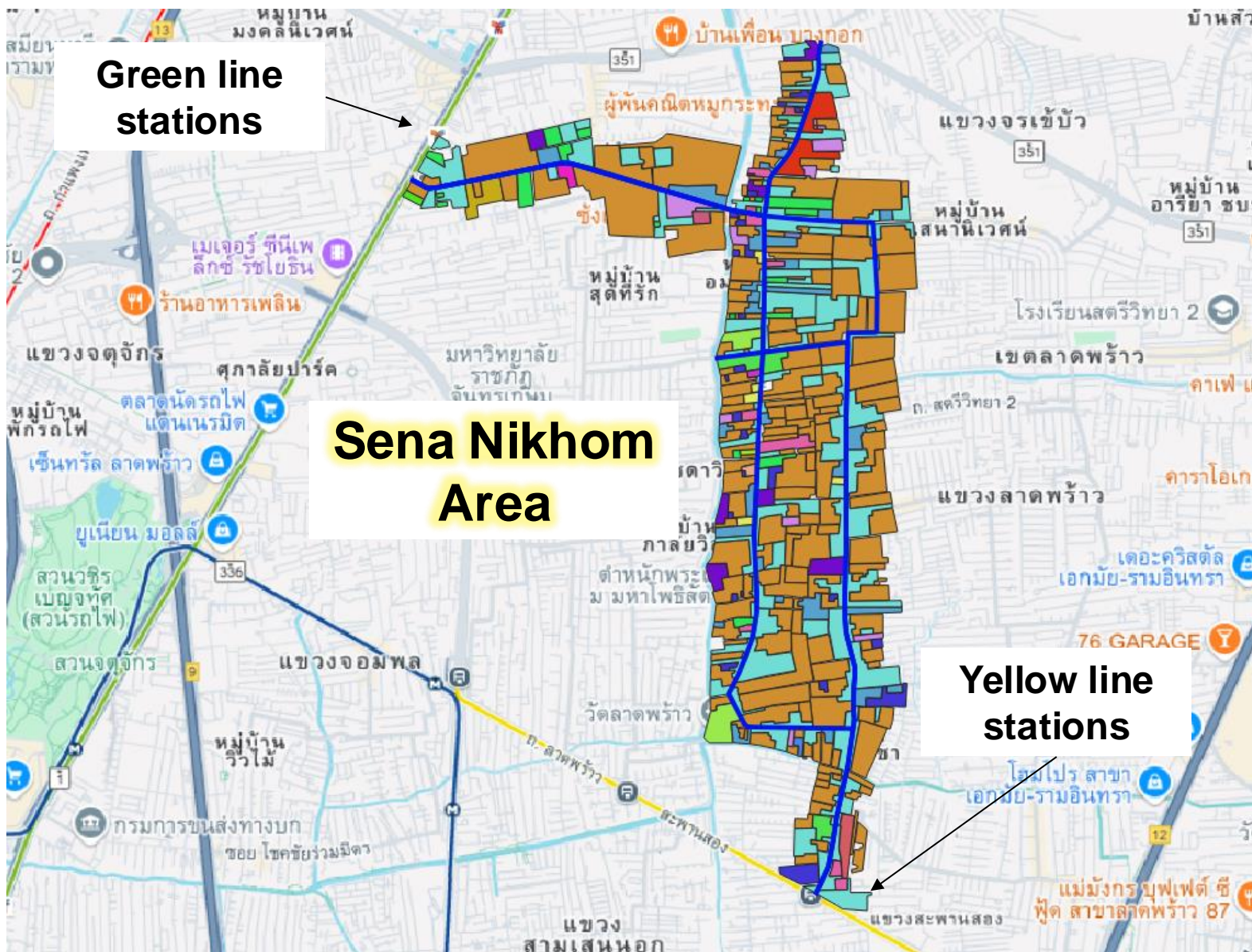
Drivers' responses to D



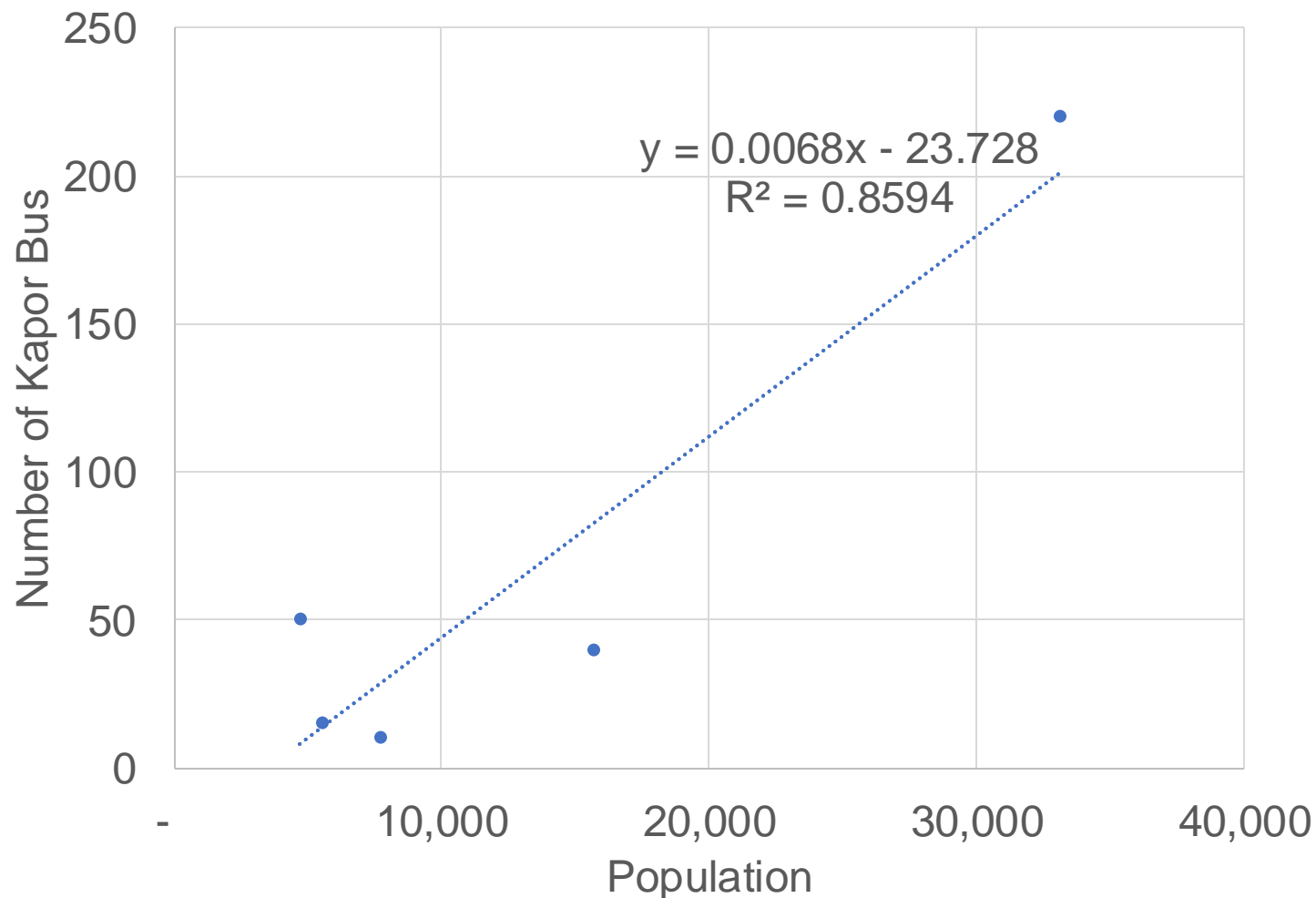
Ordered Logistic Regression Models

	Package A Independent Owner operator		Package B Smart Owner operator		Package C Flexible Rental		Package D Professional (Hired) Driver	
	Estimate	Sig.	Estimate	Sig.	Estimate	Sig.	Estimate	Sig.
Threshold								
τ_1	3.050	0.000	6.764	0.000	6.237	0.000	4.994	0.000
τ_2	6.743	0.000	9.787	0.000	8.651	0.000	8.435	0.000
Socioeconomic								
Net income <15,000 Bt	0.716	0.028	1.407	0.000	1.162	0.000	1.347	0.000
Driving Kapor <10 yrs			0.869	0.007	0.710	0.022	1.020	0.001
Present operation								
Vehicle age >10 yrs	1.940	0.000	1.991	0.000	1.768	0.000	1.632	0.000
Fuel expense	0.384	0.043	0.712	0.000	0.544	0.003		
Decreasing ridership			0.738	0.023	0.761	0.019	0.964	0.001
Ridesourcing impact							0.742	0.001
Nagelkerke R-Square	0.298		0.439		0.377		0.347	

Estimation of Kapor Bus Potential Users

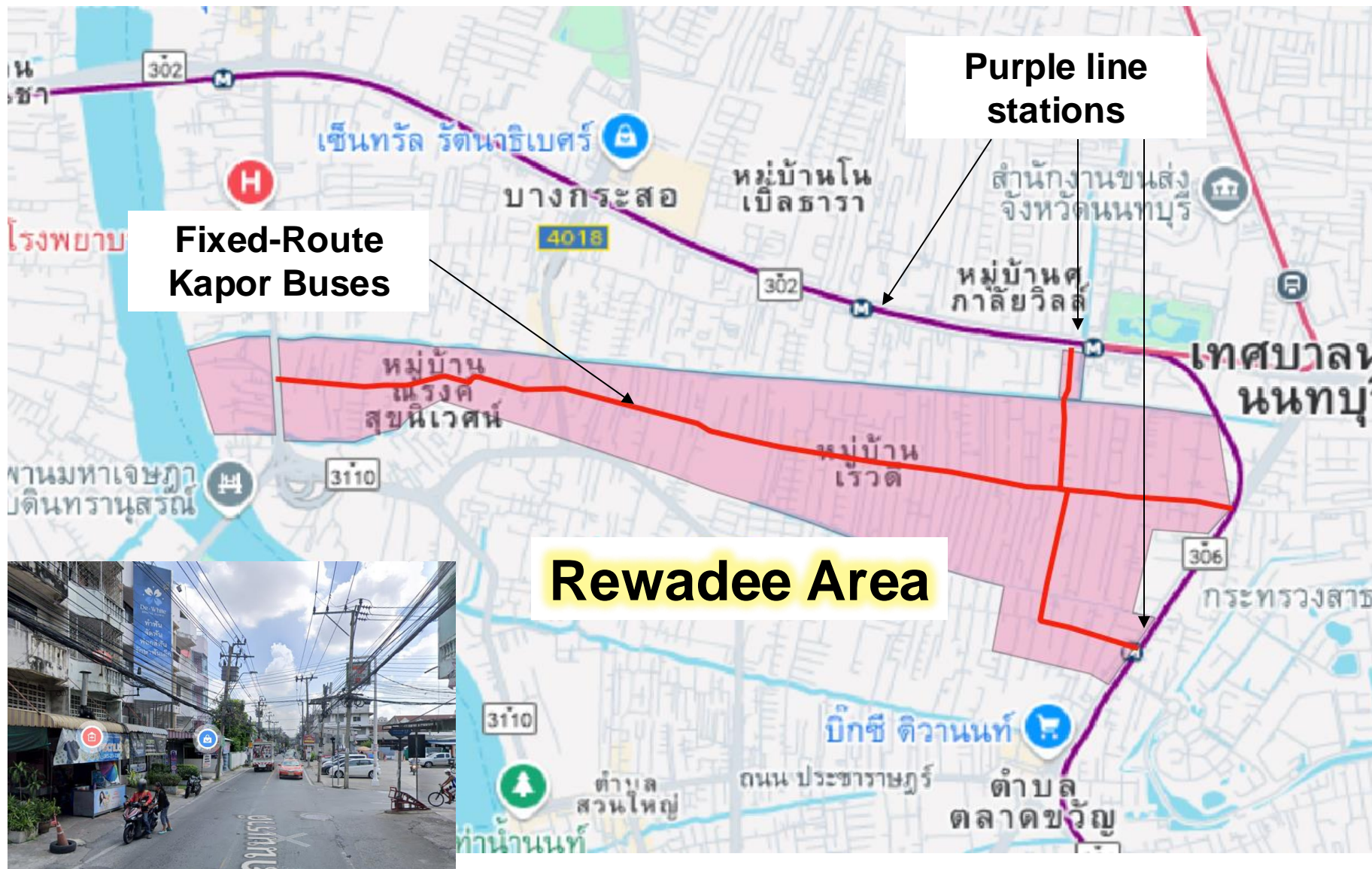


Estimation of Kapor Bus Supply



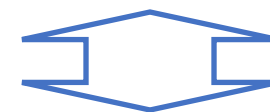
- ❖ The current supply of Kapor buses is highly dependent of the population size.
- ❖ For planning purpose, authorities can use this model to estimate the number of Kapor buses needed for varying areas.
- ❖ Need to consider the supply of various potential access modes
 - Motorcycle taxis
 - Kapor buses
 - Songthaew buses

Estimation of Kapor Bus as Station Access



Demand

Estimated
23,856
Population



Supply

138 Kapor bus
> Fixed-route
> For-hire

Concluding Remarks

❖ Passenger's Perception

- Passengers generally value **Kapor buses & Songthaew** for their affordability and safety but are concerned about convenience and time reliability.
- Competition with motorcycle taxis, ride-hailing apps, and modern modes like Muvmi is influencing ridership.

❖ Driver's Perception

- Drivers are mostly satisfied with their occupation but less satisfied with their income due to limited earnings and financial insecurity.

❖ Improvement Strategies

- Upgrade vehicle and service quality to attract more passengers.
- Kapor bus operators need proper supports.
- Explore diversification of services, such as Mobility as a Service (Maas), integrating Kapor buses into broader urban mobility systems or offering demand-responsive transport options.

❖ Incorporation into the railway planning process

- Need proper estimation of the appropriate supply of different station access modes.
- Walk > Motorcycle Taxi > Kapor Bus > Songthaew Bus >....> **On-demand bus service**

❖ Future Outlook

- Focused modernization and strategic innovations would make Kapor buses rail efficient station access.
- Collaboration with local authorities and private sectors would be essential.



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