Inception Report

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ASIAN TRANSPORTATION RESEARCH SOCIETY

Intention of Activity-From-Home and Travel after the COVID pandemic

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List of Abbreviations and Acronyms

EFA   Exploratory factor analysis

CFA   Confirmatory factor analysis

SEM   Structural equation modeling

GFI   Goodness-of-fit index

CHAPTER I   INTRODUCTION

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1.1 Background

The COVID-19 pandemic in Thailand is part of the worldwide pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The initial wave of infection started when the first known case arrived in January 2020. In response to the first outbreak, several countermeasures were implemented in varying degrees throughout the country, including temporary shutdown of portions of the public and private sectors, closing of the potential risk places, no activity in crowded places, and imposing a night curfew from 10 p.m. to 4 a.m. These measures were known as soft lockdown while necessary activities and travels were still allowed but cooperation of people to work from home was requested. The strategies that were highly effective included social distancing, face mask wearing, working from home, and staying home at night. Restrictions were gradually released in various phases until August when the first wave of the outbreak was believed ending. After a while, the following waves of infection hit Thailand. The second wave was in December 2020, the third wave was in April 2021 when the daily peak was more than 20,000 cases largely due to the Beta and Delta variants. The current fourth wave hit during late 2021 due to the Omicron variant. As of January 2022, the cumulative number of cases reported in Thailand was nearly 2.5 million and the number of deaths was more than 22,000 (Ministry of Public Health, 2020, etc.).

During these past outbreaks, the situations were so severe that urban activities were much reduced, as did the travel demand in the urban area. Many people were able and prefer to do their daily activities from home such as working, studying, food-ordering, shopping for goods and other merchandise, etc. This study defines these as doing activity-from-home (AFH). Because of AFH, for example, Vichiensan et al. (2021) found that during the first wave of COVID-19, 92% of the rail transit passengers in Bangkok reduced travelling because they did not travel but mainly stayed home while many of them changed to travel by private car due to infection risk on public transport.

The research motivation is to investigate to what extent AFH will continue post-COVID and what will be the consequent travel behavior. However, intention to do various activities from home would be influenced by several factors.

In the long term post-COVID-19, a change in lifestyle will be obvious. For instance, online working at home, at satellite office, or at café will become more popular; car dependence will become more obvious as people will avoid traveling on crowded and COVID-19 risky public transport; and some people would leave from the city centers and live in a lower density neighborhood. Policy for a systematic behavioral change of people with proper travel demand management will be needed, otherwise traffic congestion would rapidly resume, and congestion would be even more severe.(Vichiensan et al., 2021). Such new-normal lifestyle as flexible worktime or flexible workplace would help reducing congestion on road and on public transport and simultaneously increase the quality of human well-being. In terms of urban transportation planning, the transit-oriented development must incorporate the changing lifestyle where residents would do various activities from home and may travel less frequently but be more dependent on car. Travelling in the neighborhood may be more, therefore improving walk and other non-motorized transport will become necessary to keep control of unnecessary traffic congestion in the community.

1.2 Hypothesis and Objectives

The research hypothesis is twofold: (1) people will continue to do activities from home (AFH) after the COVID-19 pandemic and (2) certain amount of travel demand will be suppressed by AFH.

The research objectives are as follows:

1) To determine the post-impact of COVID on activity from home (AFH)
2) To determine the influential factors driving activity from home (AFH) after the COVID pandemic

CHAPTER 2   LITERATURE REVIEW

2.1 Theory of Planned Behavior

This study adopts the Theory of Planned Behavior (TPB) to explore factors influencing doing activities from home (AFH) in a post-COVID timeframe when there is no infection risk. TPB is a versatile framework which has been used widely, especially in the context of travel behavior. The Theory of Planned Behavior is an extension of the Theory of Reasoned Action. It states that an individual's intention to perform a behavior is related to three types of psycho-social determinants.

- Attitudes: "refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question." (Ajzen, 1991)

- Subjective Norms: "it refers to the perceived social pressure to perform or not to perform the behavior." (Ajzen, 1991)

- Perceived Behavioral Control: "refers to the perceived ease or difficulty of performing the behavior and it is assumed to reflect past experience as well as anticipated impediments and obstacles." (Ajzen, 1991)
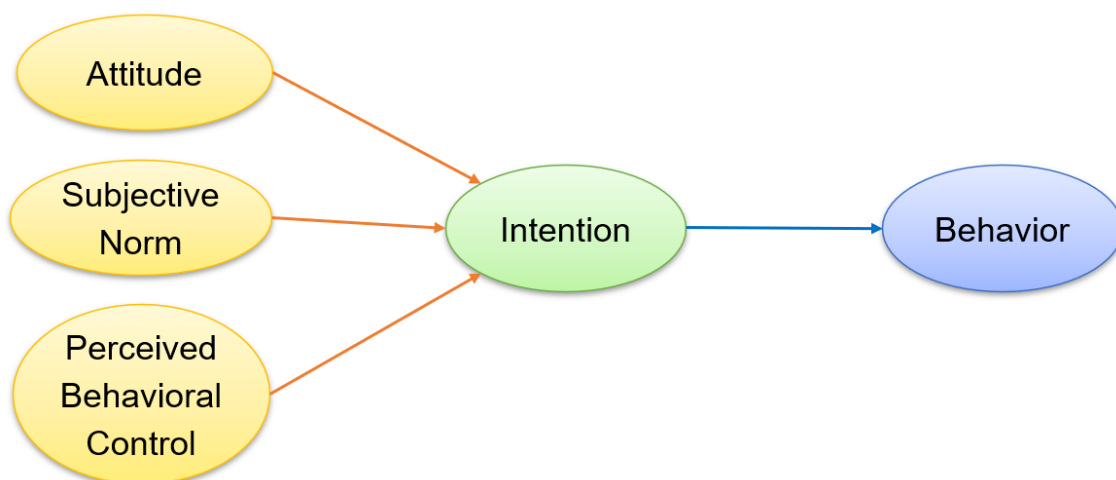

Figure 2.1 Theory of Planned Behavior

In addition to TPB, other related Psychological Theories/Models were proposed and applied in the past. They are summarized in Table 2.1.

Table 2.1 Related Psychological Theories/Models

Theories/Models	Concept
Theory of Reasoned Action (TRA), 1975	Intention to perform a certain behavior is affected by attitude and subjective norms (social influence)
Innovation Diffusion Theory (IDT), 1983	Adoption of an innovation is affected by 5 factors: relative advantage, compatibility, complexity, trialability and observability
Theory of Planned Behavior (TPB), 1985	Intention is predicted by 3 determinants: **Attitude towards behavior**, **Subjective norm** and **perceived behavior control** (that obstruct users from performing)
Value-based Adoption Model (VAM) 1988	Perceived values are the antecedence of attitude towards a certain adoption behavior and attitudes form the intention to adopt that behavior.
Technology Adoption Model (TAM), 1989	Perceived **usefulness** (expected improvements by using the service) and perceived **ease of use** (expected easiness of using the service) influence the **attitude**
Combined TAM & TPB (C-TAMTPB), 1995	Behavior **intention** is predicted by 3 determinants: attitude, subjective norms and perceived behavior control. **Attitude** is formed by perceived ease of use and perceived usefulness

Theories/Models	Concept
Unified Theory of Acceptance and Use of Technology (UTAUT), 2003	Behavioral intention is affected by 4 main factors: performance expectancy, effort expectancy, social influence and facilitating conditions and gender, age, experience and voluntariness of use act as moderating variables
Consumer Acceptance and Use of Information Technology (UTAUT2), 2012	UTAUT2 with 3 additional factors: Hedonic motivation, price value, habit

2.2 Existing Studies

Based on the existing literatures such as (Mokhtarian and Salomon, 1997), (Haddad et al., 2009), (Jain et al., 2021) and (Nguyen, 2021) etc., the psycho-social determinants of doing activities from home may be based on three general aspects:

(1) Advantages and disadvantages of AFH: time/cost saving, wiser time usage, avoiding traffic congestion, producing less and/or exposing less to PM2.5, improving work-life balance, healthier lifestyle, etc.

(2) Workplace, school, seller, and social factors: the support of the employer, school, food shops, department store to allow, encourage, and promote to work/study/shop from home, as well as the social influence of friends and colleagues working/studying/doing online shopping, etc.

(3) Perceived difficulties of AFH: the nature of the job, study, commodities that allow doing the related activities from home. Also, the technology barriers (such as how to join the online platform of meeting and good/service ordering as well as the speed of the internet connection. Although one may see a behavior as advantageous and socially desirable, if the perceived control on the behavior is low, the intention to engage in that behavior would be low (Ajzen, 1991).

Strong favorable attitudes, subjective norms and greater perceived behavioral control concerning a particular behavior, are usually associated with a strong intention to behave in a particular fashion. Additional predictors can also be included in the framework. Some previous studies presented a range of predictors such as personal or moral norms, past behavior, habit, and descriptive norms to enhance TPB-based behavioral models.

CHAPTER 3   RESEARCH METHODOLOGY

3.1 Preliminary Model Design

A statistical model is designed based on Theory of Planned Behavior, as presented in the previous chapter. The endogenous variable (also known as dependent variable) in this study is intention to increase AFH post-COVID, as compared to pre-COVID. The items representing people's attitude, subjective norm, perceived behavioral control will be determined.

3.2 Interview Survey

A questionnaire survey will be conducted. A minimum sample size of 1,200 responses is targeted to provide a representative sample of Bangkok population while stretching over geographical area (inner and outer Bangkok metropolitan area), age, and personal income. A mix of Face-to-face interview and online survey based on SurveyMonkey platform is planned.

Survey items include questions related to socio-demographic details, work and travel patterns (pre-pandemic, during pandemic and expected for post-pandemic period), attitudes, personality etc. A series of questions on a 7-point Likert scale will be asked regarding self-reported perceptions of the latent constructs of intention, attitudes, subjective norms, and perceived behavioral control that are associated with the elements of the Theory of Planned Behavior (TPB). The 7-point Likert scale is as follows: definitely agree = 7, agree = 6, somewhat agree = 5, neutral = 4, somewhat disagree = 3, disagree = 2, and definitely disagree =1.

Questions regarding intention will be asked, for example, "After the pandemic is over, I intend to work from home more frequently than I did before COVID", etc. This information will be directly related to impact on average travel to/from work, school, shop, and others.

3.3 Statistical Analysis

Analysis will be conducted in the following sequence. Firstly, exploratory factor analysis (EFA) will be conducted by using IBM SPSS Statistics 27 to understand the underlying structure of the factors, in which factor loading value of 0.30 to 0.40 is considered acceptable, value of 0.50 or larger is practically significant, value 0.70 or larger indicates a good structure. Cross-loading items will be eliminated. The Kaiser–Meyer–Olkin (KMO) value (>0.8), Bartlett's test of sphericity (p-value < 0.05), and Cronbach's alpha (>0.7) will also be checked.

Secondly, confirmatory factor analysis (CFA) will be conducted by using IBM SPSS Amos to validate the measurement models of the latent constructs that is identified through EFA. Construct reliability (>0.7) and Average Variance Extracted (AVE) (>0.5) will be determined to test the reliability of the constructs.

Thirdly, a structural equation model (SEM) will be analyzed to examine the causal effects among the latent constructs by employing IBM SPSS AMOS 27. The goodness-of-fit statistics and indices will be determined: model Chi-square (χ2), Goodness-of-Fit Index (GFI)(>0.9), Comparative Fit Index (CFI) (>0.9), Root Mean Square Error of Approximation (RMSEA)(<0.08).

The findings will shade light on the future of AFH after the COVID pandemic and provide insights on sustainable transport policy and transit-oriented development to alleviate traffic congestion in the urban area while enhance the urban mobility & accessibility, economic efficiency & social equity, reduce energy consumption, improve urban air quality and inhabitant's quality of life.

CHAPTER 4   EXPECTED OUTCOME

4.1 Expected Results

The statistical analyses, including EFA, CFA, and SEM, will suggest factors that encourage people to do activities from home. These factors are expected:

- Housing features such as high-speed internet connectivity or working space

- Neighborhood environment such as walkable neighborhood

- Transportation system such as small and smart vehicle for short distance travel

- Technology literacy, digital accessibility such as ability to use computer for teleconferencing or to use the modern application on mobile phone for do e-shopping

4.2 Benefit of the Study

The finding will shade light on the future of AFH after the COVID pandemic and provide insights on sustainable transport policy and transit-oriented development. This will altogether be a move towards SDG goals to alleviate urban traffic congestion, enhance urban mobility & accessibility, sustain the economic efficiency & social equity, reduce energy consumption, improve urban air quality, and ultimately enhance the inhabitant's quality of life.

CHAPTER 5   ACTIVITY PLAN

5.1 Work Schedule

The project's work schedule is shown in Table 3.1.

Table 5.1 Work Schedule

Activities	2022									2023		
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Literature review	■	■	■									
Data collection			■	■				■	■	■		
Statistical analysis			■	■	■							
Policy recommendation			■	■	■							
Documentation				■	■	■	■	■				

5.2 Report and Presentation

The plan of report submission and presentations are summarized in Table 3.2.

Table 5.2 Report and Presentation Plan

Reports / Presentations	Date
Inception Report	30 April 2022
Progress Report Presentation	24 June 2022
Interim Report Presentation	2 September 2022
Interim Report Submission	30 September 2022
Final report presentation and comments	16 December 2022

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