Study on Utilization of Mobile Big Data (MBD) for Assistance for Formulation of Public Transportation Plan in Thailand

Report

2021 March

Nippon Koei Co., Ltd. Softbank Corp. Agoop Corp.

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Abbreviations

MBD	Mobile Big Data
AJTP	ASEAN Japan Transport Partnership
MOT	Ministry of Transport
OTP	Office of Transport and Traffic Policy and Planning
ICTC	Information and Communications Technology Centre
MDES	Ministry of Digital Economy and Society
NBTC	National Broadcasting and Telecommunications Commission
BMTA	Bangkok Mass Transit Authority
ASCN	ASEAN Smart City Network
PDPA	Personal Data Protection Act

1. Overview

1.1 Background

In ASEAN, traffic congestion and environmental problems have become apparent and are exacerbated by the lack of efficient and economical interconnected modes of public transportation. In addition, the research and analysis methods for traffic surveys and traffic analysis have not kept up with new technologies, and there is a problem with the accuracy of demand forecasts for development of public transportation.

In particular in recent years, the development of a method for collecting location information data (mobile big data, hereinafter referred to as MBD) on mobile phones, smartphones, etc. has progressed. Analyzing methodology for flow of people / vehicle flow has also been progressing.

Under these circumstances, at the "Japan-ASEAN Transport Ministers' Meeting" held in November 2018, "Utilization of Mobile Big Data for Transportation Plan" was approved as one of the new projects based on the ASEAN Japan Transport Partnership (AJTP).

In view of the current pandemic of COVID-19, monitoring the movement of citizens and public transportation and grasping accurately the demand are critical. By cooperating from the stage of formulating efficient and effective interconnected modes of public transportation plans using the analysis technology, contributing to growth of socio-economic activities can be expected. It is considered beneficial as a way of exporting Japan's high-quality infrastructure technology.

The Ministry of Transport of Thailand is considering the use of mobile big data for policy studies in the transportation field, and Japan is requested to cooperate. The purpose of this project is to conduct studies to support the formulation of public transportation plans utilizing mobile big data in Thailand.

1.2 Project Outline

1.2.1 Project Name

Study on Utilization of Mobile Big Data (MBD) for Assistance for Formulation of Public Transportation Plan in Thailand

1.2.2 Project Period

The project period is from September 8th 2020 to March 19th 2021.

1.2.3 Project Contracting Agency

The International Policy Division, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism

2-1-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8918

Tel: 03-5253-8111 (ext. 25904)　　03-5253-8319 (direct)

Fax: 03-5253-1561

1.2.4 Project Implementing Organizations

Nippon Koei Co., Ltd.

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Tel: 03-6682-9349　　Fax03-6679-1711

1.3 Project Tasks

The project tasks are listed in the table below.

	Unit	Amount	Remarks
1. Collection of MBD and related information	Set	1	
2. Collection of basic information	Set	1	
3. Understanding the system and implementation system for utilizing MBD	Set	1	
4. MBD utilization needs	Set	1	
5. Field survey	Time	3	
6. Summary of survey results	Set	1	
7. Preparation of English version explanatory materials for target country	Set	1	
8. Explanation of the outline of the survey to the target country	Set	1	
9. Contact and coordination with target country	Set	1	
10. Creating a report	Set	1	
11. Meeting discussion	Time	5	3 intermediate meeting

1.4 Target Country/City

Bangkok, Kingdom of Thailand

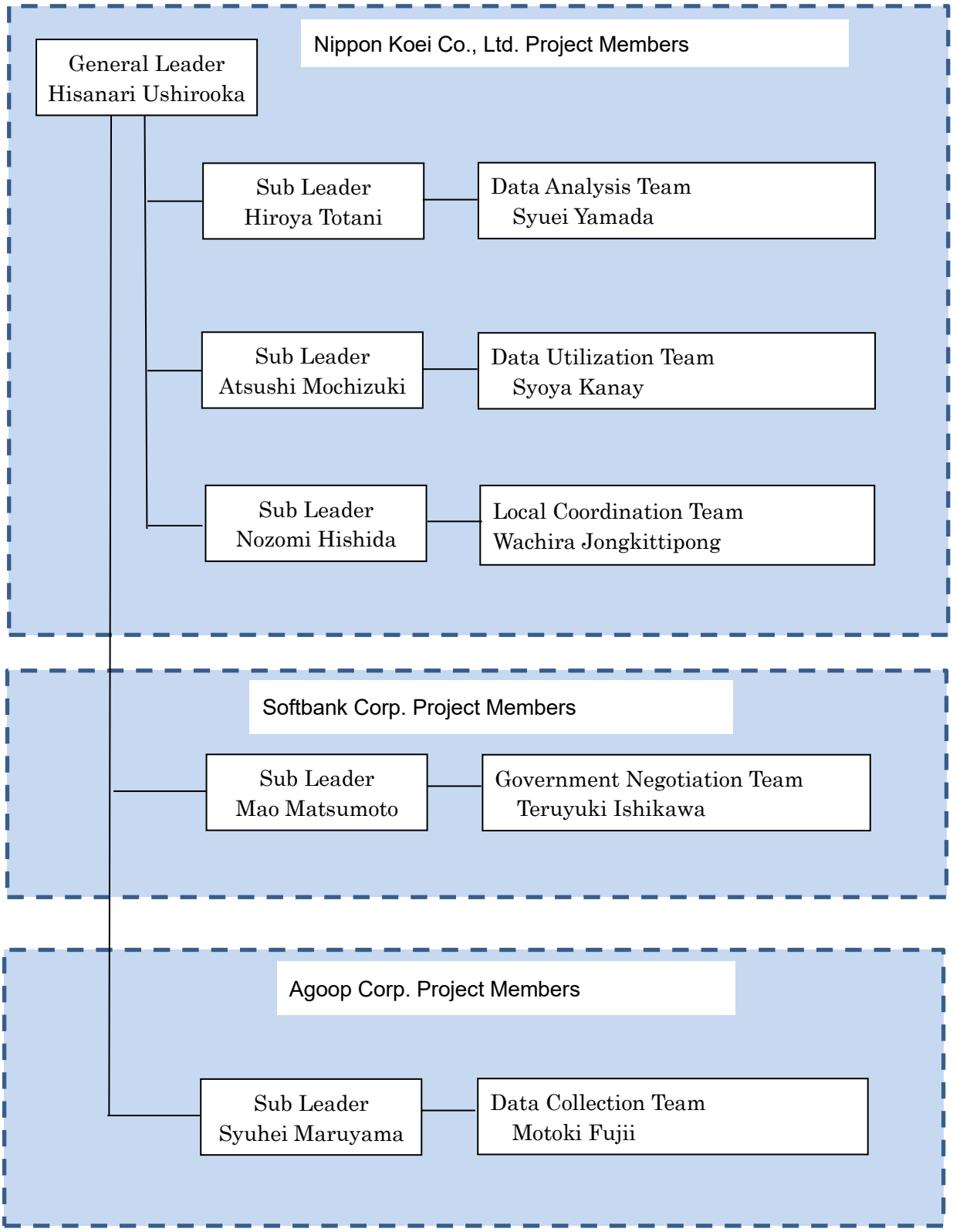
1.5 Project Schedule

The project schedule is as shown in the table below.

Item	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Remarks
0. Preparation								
1. Collection of MBD and related information								
(1)Proposal of MBD acquisition method								The solid line part of (1) shows the acquisition method proposal, and the broken line part shows the data acquisition target period.
(2)Proposal of possibility of using MBD for transportation planning								
2. Collection of Basic Information								It is expected to travel from October to November and from January to February, but depending on the situation of COVID 19, a relay WEB meeting between the local office members of JV members and the members in Tokyo is also assumed.
3. Implementation System for MBD Utilization								
4. Needs for Utilization of MBD								
5. Field Survey								
6. Summary of Survey Results								
(1) Analysis and visualization of MBD								
(2) Proposal for effective utilization of MBD								
(3)Survey report								
6. Preparation of English Version Explanatory Materials for Target Countries								
7. Explanation of Survey Outline to Target Countries								The broken line part is for preparing materials, making advance adjustments, organizing past survey history, etc.
8. Contact and Coordination with Target Countries								Assuming two trips during the period (the first is to explain the purpose and grasp needs, and the second is to explain the survey results)
9. Meeting with MLIT (①-⑤) Checking ◇, In-house Review □	①	②□		③◇	◇④	□	◇⑤	Checks are conducted by the representative company, and meetings are held as needed.

1.6 Project Team and Members

The project team and members are as shown below.



2. Collection of Basic Information

2.1 Initiatives Taken So Far

2.1.1 MBD International Seminar

MBD International Seminar was held for discussion among Japanese and ASEAN stakeholders for development of new traffic statistics utilizing mobile big data and recommendations for traffic policies in ASEAN countries such as the Kingdom of Thailand. (Organizer: JTTRI. Sponsors: MLIT, Embassy of Japan in Thailand, JICA, Ministry of Transport in Thailand).

Table 2-1 gives the outline of MBD international seminar.

In the first half of the seminar, as a keynote speech, Associate Professor Yoshihide Sekimoto of the University of Tokyo and Dr. Tyrannie Acharakun, Director of the Big Data Experience Center from the Kingdom of Thailand, gave a lecture from the perspective of utilizing big data in the transportation and tourism fields.

In the second half of the seminar, JTTRI reported on the relationship between the utilization of mobile big data and the Personal Data Protection Act (PDPA) in Japan. The ASEAN countries (Laos, Malaysia, Myanmar, Philippines, Singapore and Thailand) and the ASEAN Secretariat reported on the current status and issues of the PDPA regarding the utilization of data in each country.

Table 2-1 Outline of MBD International Seminar

Item	Contents	
Date	January, Wednesday 15th, 2020　9：00 - 12：05	
Venue	The Westin Grande Sukhumvit, Bangkok	
Theme	Utilization of Mobile Phone Big-Data (MBD)　for the Transport Sector in Thailand	
Participants	Thailand: MOT, OTP, GBGI, ATRANS, Former Minister of Transport	
	Japan: MLIT, Japanese Embassy in Thailand, JTTRI, University of Tokyo	
Contents	Opening Remarks	Masafumi Shukuri, Chairman, Japan Transport and Tourism Research Institute　(JTTRI)
	Honorable Guest Remarks1	Chayatan Phromsorn, Office of Transport and Traffic Policy and Planning (OTP), MOT, Thailand Kazuya Nashida, Ambassador to Thailand, Japanese Embassy in Thailand Yasuhiro Okanishi, Director-General for International Affairs, MLIT, Japan
	Keynote Lecture1	Yoshihide Sekimoto, Associate Professor, Institute of Industrial Science, University of Tokyo

	Keynote Lecture2	Tiranee Achalakul, Director of Big Data Experience Center, Government Big Data Institute(GBDI)
	Presentation	JTTRI, ASEAN Member States and ASEAN Secretariat
	Honorable Guest Remarks2	Arkhom Termpittayapaisith, Former Minister of Transport, the Kingdom of Thailand
	Closing Remarks	Tetsuya Okuda, Executive Director,Japan Transport and Tourism Research Institute (JTTRI)

2.1.2 Discussions on MBD

A meeting was held between Thailand and Japan on the initiatives of the MBD Project through ASEAN Japan Transport Partnership. Table 2-2 presents the outline of the discussion.

Main points of the meeting are as follows.

(1) It became clear that laws other than the PDPA are involved in Thailand for receiving processed data that cannot identify individuals from mobile operators. For this reason, MOT requested MDES to research the legal matters involved by letter. MLIT requested MOT to share the findings.

(2) MOT presented six measures being taken, utilizing MBD for formulating transportation policies and requested cooperation to MLIT. MLIT requested more specific considerations such as prioritized themes, narrowing down the study areas/targets, and etc. because it is difficult to carry out everything from the beginning.

The six measures that utilize MBD to formulate transportation policies are as follows.

1) Public transportation route setting

2) Provision of public transportation to meet passenger demand

3) Implementation of appropriate traffic management

4) Utilization for transportation planning (utilization by grasping movement patterns)

5) Development of universal design based on the behavior of the elderly (identification of transportation facilities often used by the elderly)

6) Considering a movement plan for people in the event of a natural disaster

Table 2-2 Outline of Meeting on MBD

Item	Contents
Date	January, Wednesday 15th, 2020 9：00～12：05
Venue	The Westin Grande Sukhumvit, Bangkok
Theme	Utilization of Mobile Phone Big-Data (MBD) for the Transport

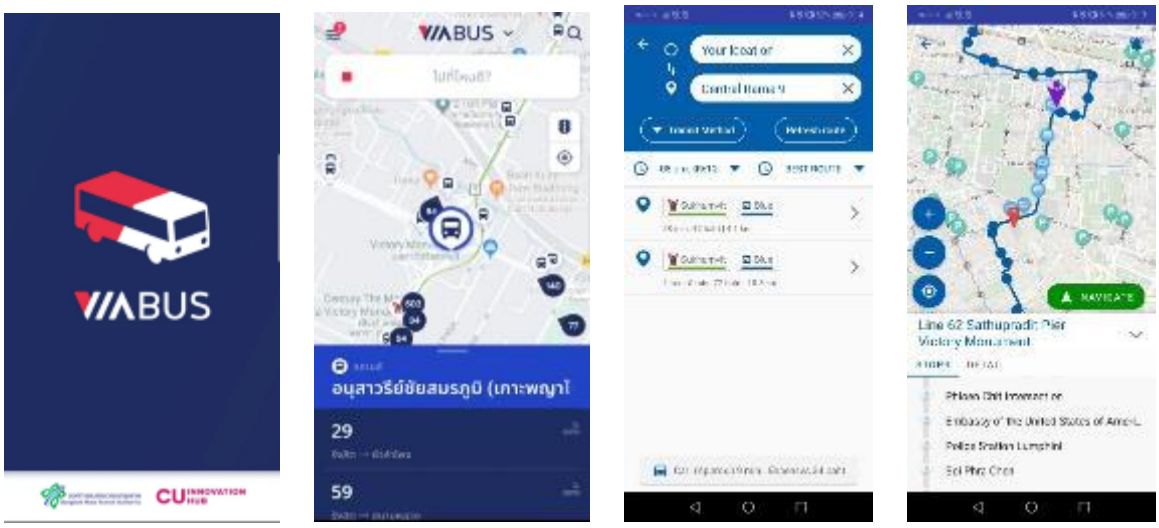
		Sector in Thailand
Participants		Thailand: MOT, OTP, MDES, NBTC, Business operator (AIS, DTAC)
		Japan: MLIT, Japanese Embassy in Thailand, Hitachi ASIA,JTTRI, Asian Transportation Research Society

2.2 Application Vendor Information

Below is an overview of Viabus and Namtang, which are public transport navigation applications.

2.2.1 Viabus

Viabus is a real-time public transport bus tracking and navigation application. The buses travel in the Bangkok metropolitan area and various parts of Thailand. The developers of the application are Bangkok Mass Transit Authority (BMTA) and Chulalongkorn University. The number of users is approximately 150,000 (iOS: approx. 70,000, and Android: approx. 80,000).

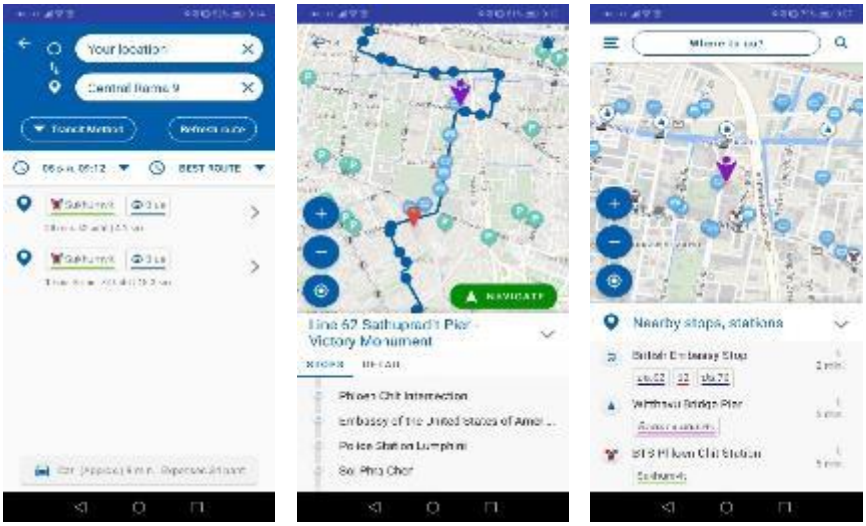


Source: App store

Figure 2-1 Screenshot of Viabus Application

2.2.2 Namtang

Namtang is a navigation application developed and owned by the MOT. It is possible to search for routes using public transportation such as MRT, buses and boats by entering the origin and destination points in Bangkok and its surrounding areas.



Source: App store

Figure 2-2 Screenshot of Namtang Application

2.3 Geographical Information / Statistical Data

2.3.1 Geographical Information

(1) GIS Data

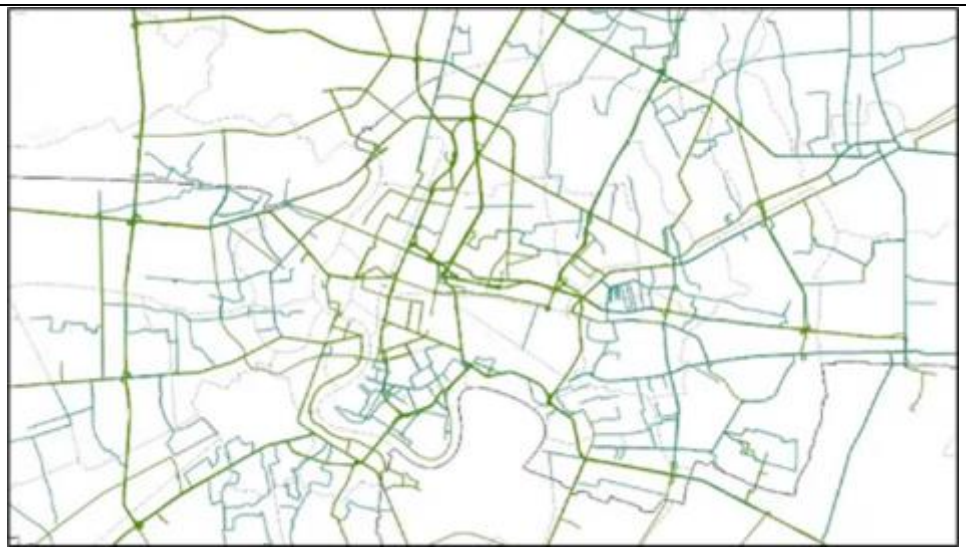
Geographical information and statistical data were collected and organized by GIS to enable smooth analysis using MBD.

The process of creating a base map of public transportation from the installation of GIS was organized in the form of a manual and shared to MOT staff for technical assistance to MOT staff.

5.3 MBD analysis method and results are shown in the created manual.

(2) Base Data of OTP

The bus network and bus stop information created by OTP are shown in Figure 2-3 and Figure 2-4, respectively.



Source: OTP

Figure 2-3 Bus Network in Central Bangkok

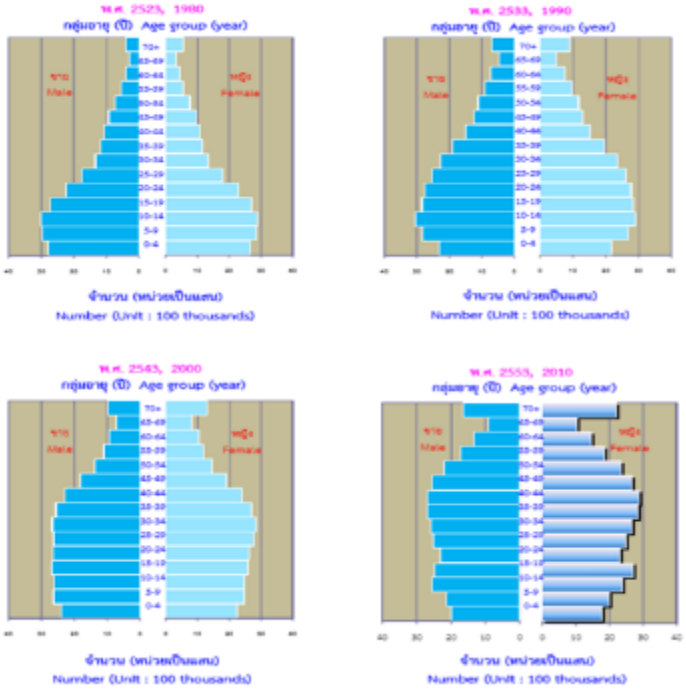
Source: OTP

Figure 2-4 Bus Stop in Central Bangkok

2.3.2 Statistical Data

(1) Demographic Statistics

The figure and table below show the population census data published on the website of Ministry of Information and Communication Technology (MICT) National Statistical Office. As shown in Figure 2-5, it can be confirmed that the birthrate is declining, and the population is aging from 1980 to 2010. As shown in Table 2-3, the population of Bangkok is increasing year by year, exceeding 8 million in 2010.



Source: National Statistical Office website

Figure 2-5 Changes in the Population by Age in Thailand

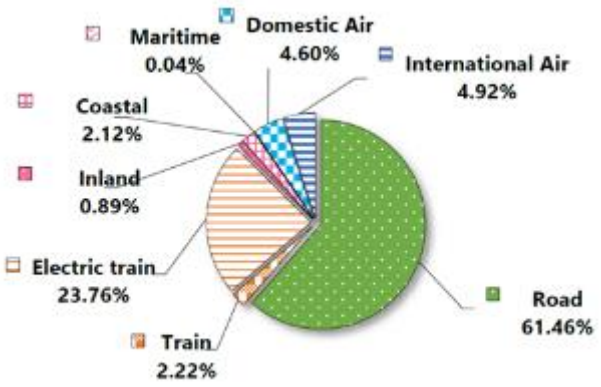
Table 2-3 Changes in the Population Census in Thailand

รายการ	2533 1990	2543 2000	2553 2010	Items
ลักษณะทางประชากร				Demographic characteristics
ประชากรรวม ('000)	5,822.4	6,355.1	8,305.2	Total population ('000)
อัตราส่วนเพศ (ชายต่อหญิง 100 คน)	92.8	90.1	94.4	Sex ratio (males per 100 females)
อัตราการเพิ่มของประชากรต่อปี	2.25	0.77	2.68	Annual growth rate
อายุมัธยฐาน (ปี)	26.0	29.8	33.6	Median age (years)
ประชากรตามกลุ่มอายุ				Population by age group
วัยเด็ก 0-14 ปี (%)	21.5	17.5	12.8	0-14 years (%)
วัยแรงงาน 15-59 ปี (%)	72.5	74.6	77.6	15-59 years (%)
วัยสูงอายุ 60 ปีขึ้นไป (%)	6.0	7.9	9.6	60 years and over (%)
อัตราส่วนการเป็นภาระ (ต่อประชากร 15-59 ปี 100 คน)				Age dependency ratio (per 100 adults 15-59 years)
รวม	37.9	34.1	28.9	Total
ประชากร 0-14 ปี	29.7	23.5	16.4	Population aged 0 - 14 years
ประชากร 60 ปีขึ้นไป	8.2	10.6	12.4	Population aged 60 years and over
อายุเฉลี่ยเมื่อแรกสมรส				Singulate mean age at first marriage (SMAM)
รวม	28.1	28.0	28.5	Total
ชาย	29.0	29.2	29.9	Males
หญิง	27.2	27.0	27.1	Females
ประชากรที่มีสัญชาติไทย (%)	na	99.0	91.4	Thai nationalities (%)
ประชากรที่ไม่ใช่สัญชาติไทย (%)	na	1.0	8.6	Non Thai nationalities (%)
ประชากรที่นับถือศาสนาพุทธ (%)	95.1	94.5	92.6	Buddhists (%)
ประชากรที่นับถือศาสนาอิสลาม (%)	4.0	4.1	4.6	Muslims (%)
ประชากรที่มีชื่อในทะเบียนบ้านตามที่อยู่อาศัยจริง (%)	na	na	57.9	Registered in actual resident (%)
ประชากรที่มีชื่อในทะเบียนบ้านภายในจังหวัดที่อยู่อาศัยจริง (%)	na	na	71.0	Registered in actual province resident (%)

Source: National Statistical Office website

(2) Modal Share

Figure 2-6 shows modal share in Thailand. Road traffic is the most common at 60% or more, followed by trains at 20% or more.



出典：Transport Statistics, MOT, 2020.9

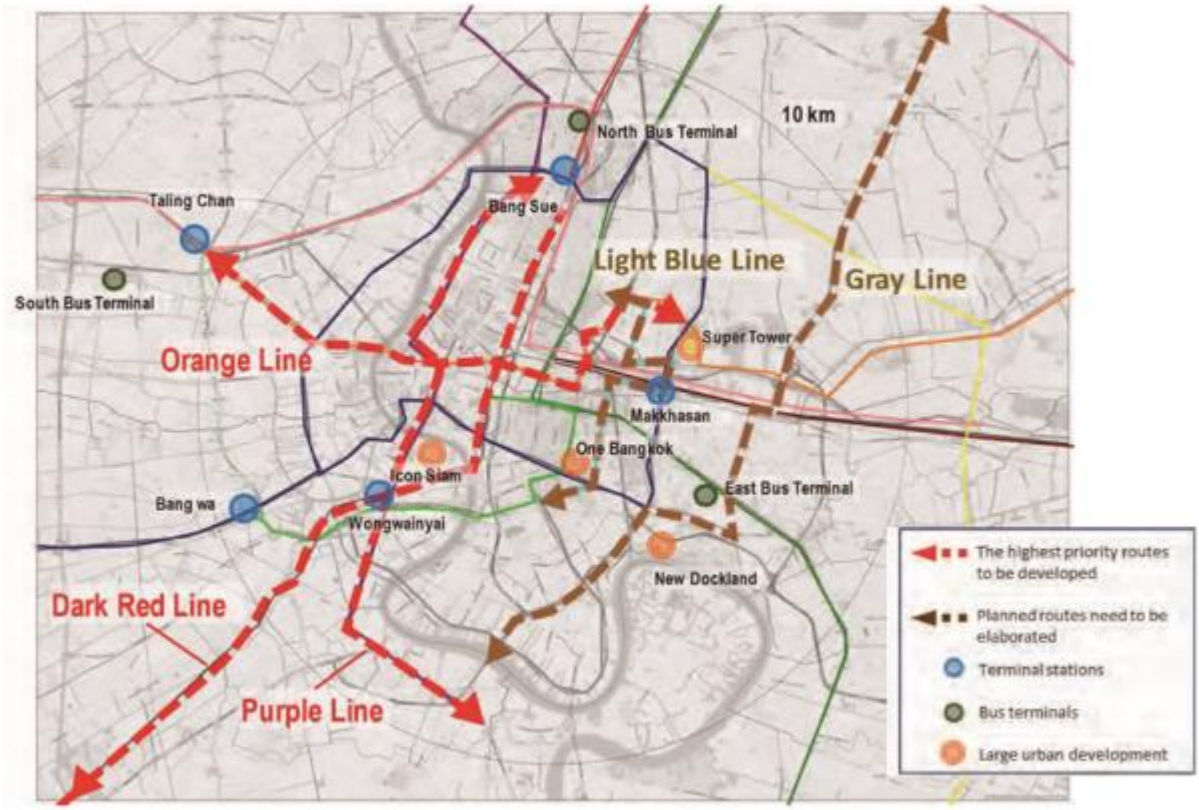
Figure 2-6 Modal Share in Thailand

2.4 Urban Transportation Planning

2.4.1 Second Master Plan on Mass Rapid Transit in Bangkok Metropolitan Region（M-MAP2）

The Mass Rapid Transit Master Plan in Bangkok Metropolitan Region (M-MAP) was formulated in 2010. This is a basis of the urban railway currently being constructed and planned. It aims to expand the railway network in the metropolitan area to 312 stations with a total length of 509 km by 2029. However, as shown in the figure below, the development of urban railway lines is delayed, especially in the city center, compared to the planned implementation of M-MAP.

In addition, as new and existing routes extend to the suburbs, issues such as improving accessibility to railway stations, integrating with urban development, and providing high-quality services have become apparent, as well as network development. Therefore, the revised "Master Plan (M-MAP2)" including the construction and development of new lines with the target year of 2037 is being formulated.



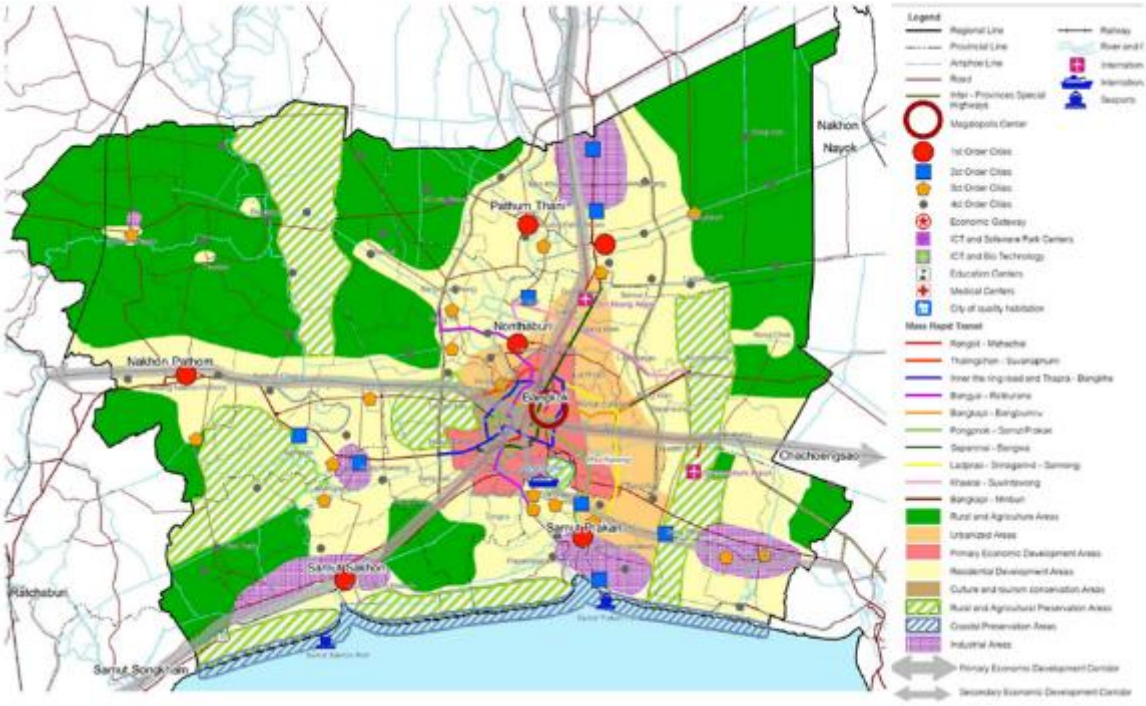
Source: Data Collection Survey on the Development of Blueprint for the Second Mass Rapid Transit Master Plan (M-MAP2) in the Kingdom of Thailand, JICA, 2019

Figure 2-7 Undeveloped Section of M-MAP Planned Route

2.4.2 Bangkok and its Vicinity Regional Plan 2057

In 2009, DPT formulated "Bangkok and its Vicinity Regional Plan 2057" to bring out the region's development potential. It also aimed to create a framework and guidelines for a consistent planning and development, and cooperate with public and private development projects.

Considering the urban sprawl into the agricultural areas beyond Bangkok's vicinity, this regional plan sets the basic concept of a multi-core urban structure with satellite towns to support a wide range of activities, thus easing the burden on Bangkok.



Source: 2.4.2 Bangkok and its Vicinity Regional Plan 2057, DPT, 2009

Figure 2-8 Development Policy for Bangkok and its Vicinity

2.4.3 Smart City Plan

Bangkok is a candidate city for the ASEAN Smart City Network (ASCN), and smart city-related developments such as the Bansoo Central Station Development Project are underway.

According to the JETRO Regional and Analysis Report[1], Thailand aims to develop smart city plans in 100 cities in all 76 prefectures by 2022 as summarized in the table below.

[1] https://www.jetro.go.jp/biz/areareports/special/2019/0801/2a3db5f0d050195c.html

Table 2-4 Smart City Plan in Thailand

Target year	Target	Prefecture name
1st year (2018-2019)	7 prefectures and 10 areas	● Phuket (mobility, environment / disaster prevention, deregulation / e-government) ● Conken (medical, e-government) ● Chiang Mai (Tourism, e-government) ● EEC region [Chonburi, Rayon, Chachensao] (all fields) ● Bangkok (all fields)
2nd year (2019-2020)	24 prefectures and 30 areas	● Ubon Ratchathani (sightseeing) ● Udon Thani (trade, border logistics, security) ● Border area [Nong Khai, Nakhon Phanom, Mukdahan] (trade, border logistics, etc.) ● Other prefectures [Chiang Rai, Phitsanulok, Nan, Krabi, Phang Nga, Songkhla, Yarra, Pattani, Narathiwat, Satun, Nakon Sitamasat, Ranong]
3rd year (2020-2021)	30 prefectures and 60 areas	-
5th year (2022)	● All prefectures (76 prefectures and Bangkok), at least 100 areas ● Introduction of urban data platform ● Formation of three or more world-recognized smart cities	-

Source: JETRO Region / Analysis Report, Special Feature: Asia's Smart City Concept

3. Implementation System for MBD Utilization

3.1 MBD Utilization System

3.1.1 Personal Data Protection Act

(1) Background

In recent years, the Thai government has set up a national policy called Thailand 4.0, and is focusing on improving the business environment, including fostering the digital industry and enacting related legislation.

It supports the development of the digital industry that uses large-scale data such as AI, IoT, and big data.

There is an urgent need to establish a legal infrastructure to prevent the damage and spread of loss due to unauthorized use of personal information and invasion of privacy.

(2) Enforcement Period

Personal Data Protection Act (PDPA) was partially enforced on May 28, 2019. The main article of the act was to be applied one year after its entry into force which is May 27, 2020.

However, due to COVID-19, there is a risk that companies will not be ready for PDPA in time, and the Ministry of Digital Economy and Society of Thailand postponed the enforcement of some articles for one year i.e. May 31, 2021. This is according to cabinet decision on May 19, 2020.

(3) Overview of PDPA

Table 3-1 gives an overview of PDPA. It consists of 7 chapters; Chapter 1:Personal Data Protection Committee, Chapter 2: Personal Data Protection, Chapter 3: Rights of the Data Subject, Chapter 4 : Office of the Personal Data Protection Committee, Chapter 5 : Complaints, Chapter 6 : Civil Liability and Chapter 7 : Penalties.

Chapter 2, Chapter 3, Chapter 5, Chapter 6, Chapter 7, and Article 95 : Grandfather Clause or Provisional Measures were postponed by the cabinet meeting on May 19.

Personal Data Protection Committee has not yet been established, and subordinate norms such as government ordinances, rules, and guidelines that stipulate specific contents have not been established.

Table 3-1 Overview of PDPA

Chapter	Title	Contents
1	Personal Data Protection Committee	Composition of the Personal Information Protection Commission
2	Personal Data Protection	Collection, use, disclosure of personal information
3	Rights of the Data subject	Rights of personal information owners
4	Office of the Personal Data Protection Committee	Establishment of personal information protection committee secretariat
5	Complaints	Examination of significance claims
6	Civil Liability	Compensation in case of causing damage to the personal information owner
7	Penalties	Criminal punishment, administrative punishment

(4) Personal Data

Section 6 in the act states, " Personal Data means any information relating to a Person, which enables to identify such Person, directly or indirectly, but not including the information of the deceased Persons."

Examples of personal data include names, addresses, telephone numbers, email addresses, ID numbers, monitoring camera images, IP addresses and cookies, credit card information.

Among personal data, sensitive data subject to particularly strong regulations include racial, ethnic origin, political opinions, cult, religious or philosophical beliefs, sexual behavior, criminal records, health data, disability, trade union information or of any data which may affect the data subject in the same manner, as prescribed by the Committee (see Section 26).

(5) Application Range

1) Inside Thailand

PDPA is applied to Data Controller and Data Processor in Thailand. Data subject also applies outside Thailand.

Data Controller means a Person or a juristic person having the power and duties to make decisions regarding the collection, use, or disclosure of the Personal Data.

Data Processor means a Person or a juristic person who operates in relation to the collection, use or disclosure of the Personal Data pursuant to the orders given by or on behalf of a Data Controller, whereby such Person or juristic person is not the Data Controller.

Data Subject is the person who belongs to the personal data.

2) Outside Thailand (Extraterritorial Application)

It also applies outside Thailand in the following cases.

- When acquiring personal data related to the provision of goods and services to the person in Thailand
- When the acquisition of personal data is related to the behavior monitoring of the person in Thailand

(6) Collection of Personal Data

1) Privacy Notice

Section 23 describes privacy notices. It is essential to notify the data subject of the following contents, prior to and at the time of collecting personal data;

- Purpose of collection of the personal data
- Notification of the case where the data subject must provide his or her Personal Data for compliance with a law, or contract, or where it is necessary to provide the Personal Data for the purpose of entering into the contract, including notification of the possible effect where the data subject does not provide such Personal Data
- Personal Data to be collected and the period for which the Personal Data will be retained.
- Categories of Persons or entities to whom the collected Personal Data may be disclosed
- Information, address, and the contact channel details of the Data Controller, where applicable, of the Data Controller's representative or data protection officer
- The rights that the person has on the PDPA

2) Acquisition of Consent

Section 24 describes the acquisition of consent. The consent of the data subject is required to collect personal data except in the following cases;

- In the case of achievement of the purpose relating to the preparation of the historical documents or the archives for public interest, or for the purpose relating to research or statistics, in which the suitable measures to safeguard the data subject's rights and freedoms are put in place and in accordance with the notification as prescribed by the Committee.
- In the case of preventing or suppressing a danger to a Person's life, body or health
- In the case of necessity for the performance of a contract to which the data subject is a party, or in order to take steps at the request of the data subject prior to entering into a contract.
- In the case of necessity for the performance of a task carried out in the public

interest by the Data Controller, or necessary for the exercising of official authority vested in the Data Controller.

- In the case of necessity for legitimate interests of the Data Controller or any other Persons or juristic persons other than the Data Controller, except where such interests are overridden by the fundamental rights of the data subject of his or her Personal Data.
- In the case of necessity for compliance with a law to which the Data Controller is subjected.

3) Requirements for Consent

Section 19 describes the requirements for consent as follows;

- It is necessary to obtain the consent in writing statement or via electronic means.
- It is necessary to inform the purpose of collection, use, or disclose of personal data upon consent.
- The form of consent should be clearly distinguished from other content, in a format that is easily understood and accessible, and written in clear and plain language.
- Fooling or leading misinterpretation of the data subject for the above purposes shall be avoided.

(7) Data Transfer

1) Data Transfer inside Thailand

Section 27 describes that the Data Controller shall not use or disclose Personal Data without the consent of the data subject, unless it is the Personal Data which is collected without requirement of consent under section 24 or section 26.

2) Data Transfer outside Thailand

Section 28 describes that it is possible for Data Controller to send or transfer the Personal Data to a foreign country in the following cases.

- The destination country or international organization that receives Personal Data shall have adequate data protection standard
- It shall be carried out in accordance with the rules for the protection of Personal Data as prescribed by the Committee

Furthermore, the following circumstances are construed as outside the applicable case and transferring to a foreign country is possible;

- where the consent of the data subject has been obtained, provided that the data subject has been informed of the inadequate Personal Data protection

standards of the destination country or international organization.

- where it is for compliance with the law.
- where it is necessary for the performance of a contract to which the data subject is a party, or in order to take steps at the request of the data subject prior to entering into a contract.
- where it is necessary for carrying out the activities in relation to substantial public interest.
- where it is to prevent or suppress a danger to the life, body, or health of the data subject or other Persons, when the data subject is incapable of giving the consent at such time.

(8) Data Management

1) Security Measures

Section 37 (1) describes that it is obligatory to take appropriate security measures for the collected personal data.

2) Duty of Reporting

Section 37 (4) describes that it is obligatory to notify the office of any Personal Data breach within 72 hours after having become aware of it, unless such Personal Data breach is unlikely to result in a risk to the rights and freedoms of the Persons

3) Obligation to Record and Management of Personal Data

Section 39 describes that the Data Controller shall maintain, at least, the following records in order to enable the data subject and the office to check.

- The collected Personal Data.
- The purpose of the collection of the Personal Data in each category.
- Details of the Data Controller.
- The retention period of the Personal Data.
- Rights and methods for access to the Personal Data, including the conditions regarding the Person having the right to access the Personal Data and the conditions to access such Personal Data.
- The use or disclosure without consent.
- The rejection of request or objection.
- Explanation of the appropriate security measures.

3.1.2 Questions and Answers to NBTC / MDES

MOT enquired NBTC and MDES about the utilization of MBD for transportation planning, and the answers were given. The summary of correspondence and the questions and answers are shown in Table 3-2 to Table 3-4.

Table 3-2 Summary of Correspondence of Enquiries on Utilization of MBD for Transportation Planning

Enquired	Answered
From Chaiwat Thongkamkung, Permanent Secretary, MOT To Chairman, NBTC March 18, 2020	From Permanent Secretary, MDES To Permanent Secretary, MOT March 26, 2020
From Chaiwat Thongkamkung, Permanent Secretary, MOT To Permanent Secretary, MDES March 18, 2020	From Deputy Commissioner, NBTC To Permanent Secretary, MOT April 19, 2020

Table 3-3 MOT Questions and MDES Answers

	MOT Question	MDES Answer
1	Does MBD (including gender, age and location information) fall under the definition of PDPA?	● It is necessary to consider whether the information can identify an individual or is associated with the individual.
2	Can a telephone communication service provider process mobile phone usage data into the information required by MOT? Is this process contrary to Thai law, rules and notifications? If a problem arises, what is the solution?	■PDPA Section 24 The Data Controller shall not collect Personal Data without the consent of the data subject, unless: ➢ It is for the achievement of the purpose relating to the preparation of the historical documents or the archives for public interest, or for the purpose relating to research or statistics, in which the suitable measures to safeguard the data subject's rights and freedoms are put in place and in accordance with the notification as prescribed by the Committee (Section 24 (1)) ➢ It is necessary for the performance of a task carried out in the public interest by the Data Controller, or it is necessary for the exercising of official authority vested in the Data Controller (Section 24 (4)) ➢ It is necessary for compliance with a law to which the Data Controller is subjected (Section 24 (4))
		● Regarding MBD, the collection, use and disclosure of personal information will be carried out based on the

		above principle. ● If the exceptions do not apply, it is necessary to obtain permission from the personal information owner before collecting, using or disclosing.
3	About the progress of establishment of the Personal Data Protection Committee and the plan for preparation for the enforcement of the PDPA in May 2020	● MDES is in charge of the secretariat work of the Personal Data Protection Committee. ● The chairman and expert advisors have been selected, and the secretariat of the Personal Data Protection Commission is being established. (Scheduled to end in early April) ● It is in the preparatory stage for rule-making for implementation under the law and some of the bills that need to be announced in a hurry.

Table 3-4 MOT Questions and NBTC Answers

	MOT Questions	NBTC Answers
1	Does MBD (including gender, age, and location information) fall under the definition of the NBTC Notification on the protection of personal information rights, privacy rights, and freedom of communication of communication service users?	■NBTC Notification, Section 1 Personal information is "user information, facts, or details, service usage status, and communication number that can be directly or indirectly identified by the service user. It also includes the behavior of the user in using the communication service. However, it does not include the necessary technical information for the benefit of managing the communications network, for the benefit of communication, and for the benefit of the license holder's overall business implementation."
		● If it has any of the above characteristics, it is considered as personal information.
2	Can a telephone communication service provider process mobile phone usage data into the information required by MOT? Is this process contrary to Thai law, rules and notifications? If a problem arises, what is the solution?	■NBTC Notification, Section 1 Information processing is defined as "acts related to the use, disclosure, and correction of personal information of users regardless of the means of use, including the transmission or transfer of personal information specified in the telecommunications business." ■Notification, Section3 Information processing principle: In addition to obtaining permission from the service user, it must be carried out only for the benefit of telecommunications business, and it must comply with the rules stipulated in the above notification.
		● Information processing in the format required by

		MOT for mobile phone usage data is considered to be an act related to the use and disclosure of personal information, so information processing may not be possible. ● Information processing may not be possible because it is not an act for the benefit of the telecommunications business. ● It is necessary to consider the utilization of MBD for transportation planning required by the Ministry of Transport based on PDPA ● PDPA must be additionally applied regardless of whether it overlaps with the relevant law. ● Regarding the use of MBD for transportation planning, advice should be sought from the Personal Information Protection Commission Secretariat as to whether the following exceptions are considered. ● Advice should be sought from the Personal Data Protection Commission Secretariat as to whether the use of MBD for transportation planning is regarded as an exception.
		It is necessary for the performance of a task carried out in the public interest by the Data Controller, or it is necessary for the exercising of official authority vested in the Data Controller (PDPA Section 24 (4))

3.2 Implementation Structure for MBD Utilization

3.2.1 MOT Implementation Structure

MOT is considering data utilization of Namtang application owned by OTP.OTP is a department that formulates transportation policies and plans in Thailand. They are considering transportation policies and plans using MBD.

3.2.2 Personal Data Protection Committee

Section 8 shows the composition of the Personal Data Protection Commission as summarized in Table 3-5.

Section 12 states the terms of chairman and honorary director. It states four years per term, and that reappointment for more than two terms is not possible.

The Personal Data Protection Commission may provide specific definitions of personal data in such forms as guidelines in the future. However as of March 2021,

the members of the Personal Data Protection Commission have not been selected yet.

Table 3-5 Composition of the Personal Data Protection Commission

Composition	Contents
Chairperson	A chairperson who is selected and appointed from persons having distinguished knowledge, skills, and experience in the field of Personal Data protection, consumer protection, information technology and communication, social science, law, health, finance, or any other field that must be relevant to, and useful for the protection of Personal data.
Permanent Secretary	the Permanent Secretary of the Ministry of Digital Economy and Society, shall be a Vice-Chairperson.
Directors	Directors by position as five members consisting of the Permanent Secretary of the Prime Minister Office, the Secretary-General of the Council of State, the Secretary-General of the Consumer Protection Board, the Director-General of the Rights and Liberties Protection Department, and the Attorney General.
Honorary directors	honorary directors as nine members, selected and appointed from the persons having distinguished knowledge, skills, and experience in the field of Personal Data protection, consumer protection, information technology and communication, social science, law, health, finance, or any other field that must be relevant to, and useful for the protection of Personal Data.

3.3 Institutiona Issues of MBD Utilization

In the example of personal data defined in Section 6 of PDPA, there is no description of location information. However, it is not possible to judge whether the location information corresponds to personal data because the enforcement of PDPA has been postponed until May 31, 2021 and the Personal Data Protection Commission has not been established.

Therefore, it is necessary to confirm that the location information does not correspond to personal data after the Personal Information Protection Law is enforced.

4. Situations and Needs for Utilization of MBD in the Transportation Field

Several meetings were held to understand the actual situation and needs of MOT's utilization of MBD in the transportation field.

It was initially planned to hold a face-to-face meeting. But due to COVID-19, it became impossible to travel. Therefore, only members of the Bangkok office of the project team visited the MOT meeting room and held online meetings.

The summary and results of the meetings are as follows.

4.1 Meeting Summary

The meeting with MOT is summarized in Table 4-1.

Table 4-1 Meeting Summary with MOT

	Date	Contents	Participants
1	October 19, 2020 (Monday) 15:30 - 17:30	<Kick-off meeting> 1. Project summary 2. Aim of this project 3. What we can do with MBD 4. Number of samples required in Bangkok 5. Regarding location information 6. Cooperation request to the application vendor	● ICTC
2	December 4, 2020 (Friday) 13:30 - 15:45	<MOT Deputy Permanent Secretary Meeting> 1. Project summary 2. Previous discussions 3. GOAL of this project 4. Report of considerations on Japan side 5. Mechanism of SDK 6.Our understanding of the legal system in regard of MBD handling 7. Answer to Concerns 8. Studies in this year 9. Cooperation request to the application vendor	● MOT ● OTP ● BMTA ● DLT ● ViaBus
3	December 16, 2020 (Wednesday) 12:00 - 14:00	< Confirmation of Namtang > 1.About Namtang App 2. Other data	● OTP ● ICTC
4	December 24, 2020 (Thursday) 15:30 - 17:00	<Technical Assistance> 1. Output image 2. Confirmation of TA implementation method	● OTP ● ICTC
5	March 17, 2021 (Wednesday) 15:30 - 17:00	<Summary of Technical Assistance> 1. Summary of Technical Assistance 2. Current status and utilization of Namtang data 3. Future activities	● OTP ● ICTC

4.2 Meeting Result

4.2.1 First Meeting: Kickoff Meeting

(1) Participants

1) Thai side: ICTC Meeting Room

●ICTC (Information and Communications Technology Centre)

- Ms.Sukanya Director and 4 others

2) Japan side: ICTC Meeting Room

●Embassy of Japan in Thailand

- Yukihisa Hirose, First Secretary

●Nippon Koei Co., Ltd.

- Nozomi Hishida

●Interpreter

- Pattara Leeler Plut

3) Japan side: Online Meeting

●International Policy Division, Policy Bureau, Ministry of Land, Infrastructure and Transportation (MLIT)

- Yasuaki Uchino, Kunio Takeda, Toru Shimano

●Nippon Koei Co., Ltd.

- Hisanari Ushirooka, Atsushi Mochizuki, Hiroya Totani, Shuei Yamada

●Softbank Corp.

- Mao Matsumoto

●Agoop Corp.

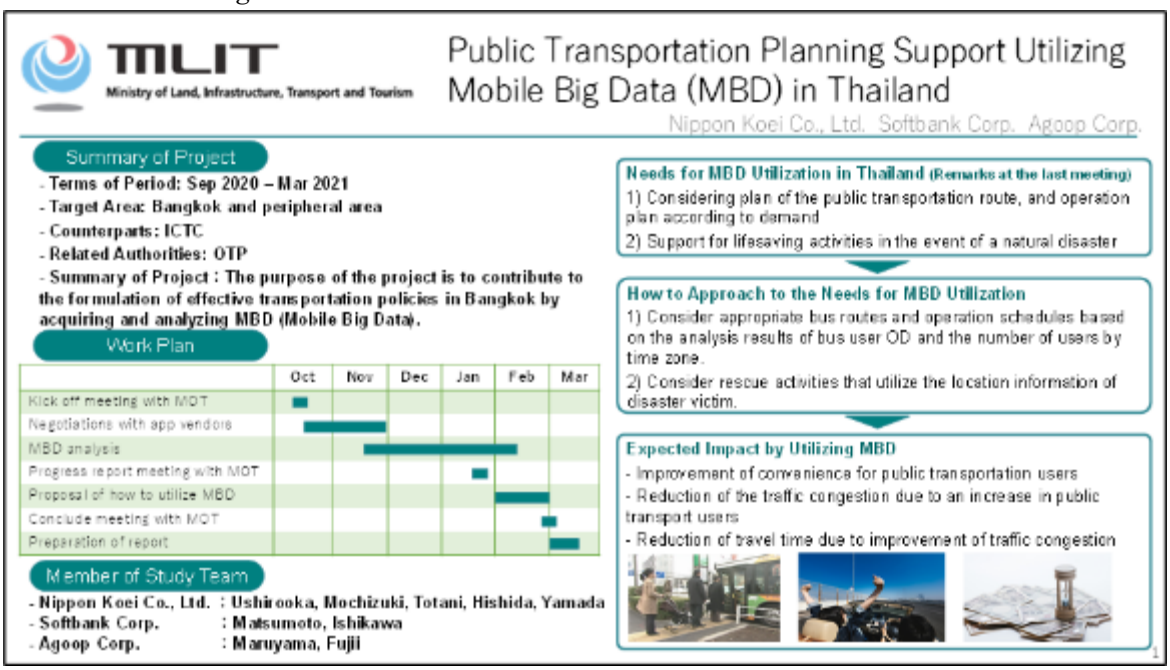
- Syuhei Maruyama, Mikio Fujii

(2) Summary of Discussion

1) The Japan side will consider the following two plans and report the results at the next meeting.
   - Option 1: To develop a new app and have volunteers use it.
   - Option 2: To install SDK in the VIABUS app.
2) Thai side will explain to the Deputy Permanent Secretary using meeting materials. A letter will be submitted to VIABUS with the permission of the Deputy Secretary-General.

(3) Meeting Materials

The meeting materials are shown below.



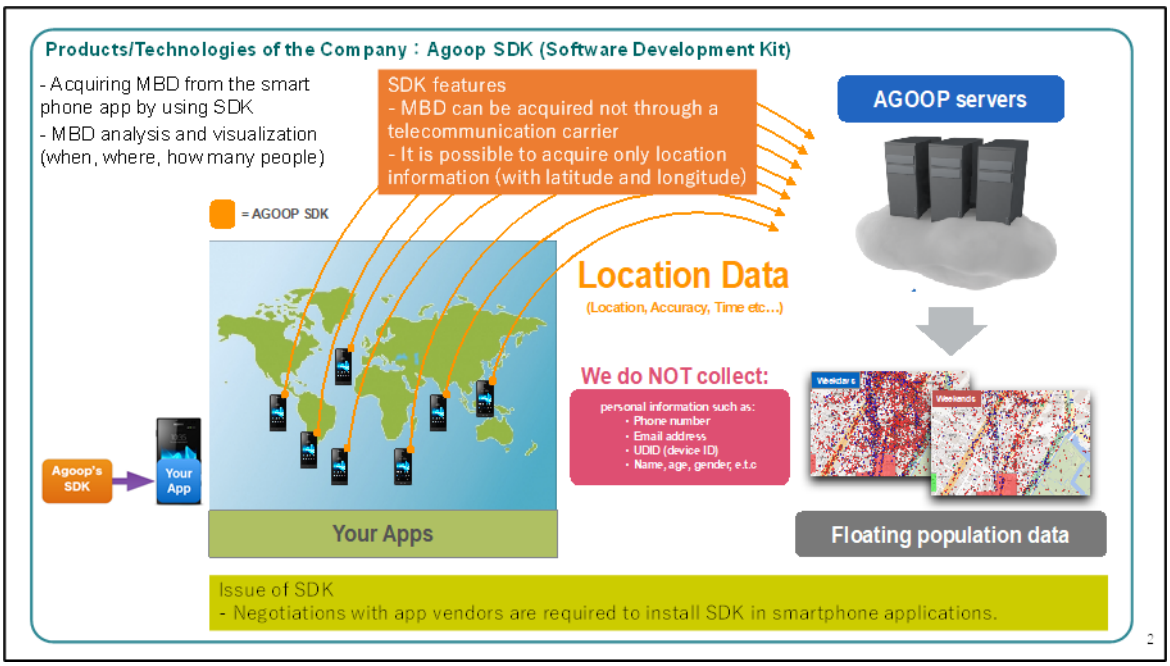


Figure 4-1 1st Meeting Material Part 1

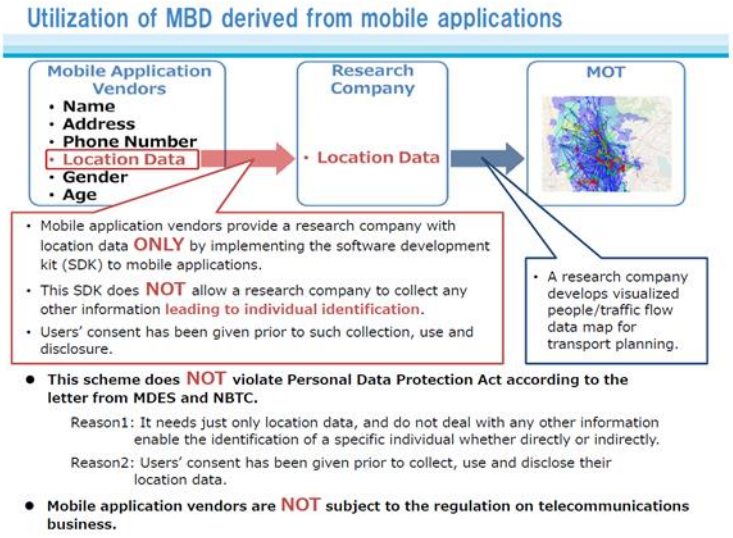
Summary of Our Understanding on Related Legal Issues

Act/Announcement	Our Understanding
Personal Data Protection Act (PDPA)	• MBD collected via SDK is only the location data, and it does not include the information which can identify the individual person. • Thus, MBD collected via SDK will NOT be the subject of PDPA.
NBTC 2006.8.18 Announcement under Telecommunication Business ACT 2001	• SDK will ask the permission of data utilization for public purpose from the application user. • The data will be collected via SDK attached to the mobile phone application, NOT through telecommunication operator. • Mobile phone application vendor is NOT the subject to the regulation under Telecommunication Business ACT 2001, thus the MBD collected via SDK will NOT offend against the NBTC announcement and Telecommunication Business ACT 2001.

3

Summary of Our Understanding on Related Legal Issues

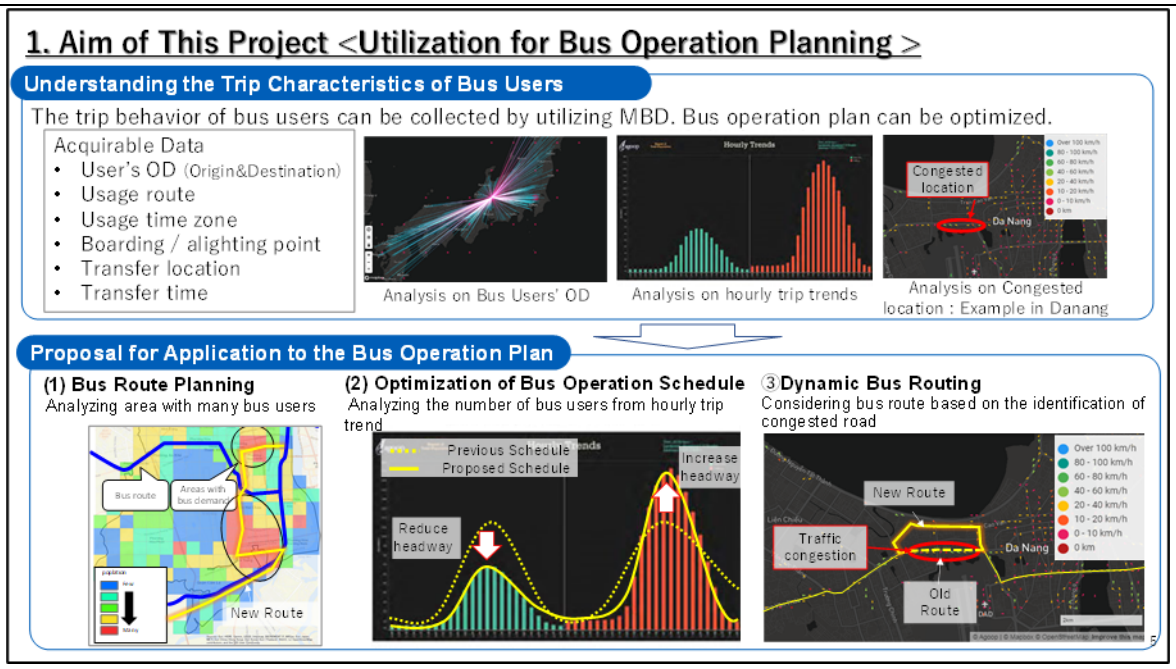
Ref. Meeting material from ICTC-EOJ meeting in June 2020



- **This scheme does NOT violate Personal Data Protection Act according to the letter from MDES and NBTC.**
  - Reason1: It needs just only location data, and do not deal with any other information enable the identification of a specific individual whether directly or indirectly.
  - Reason2: Users' consent has been given prior to collect, use and disclose their location data.
- **Mobile application vendors are NOT subject to the regulation on telecommunications business.**

4

Figure 4-2 1st Meeting Material Part 2



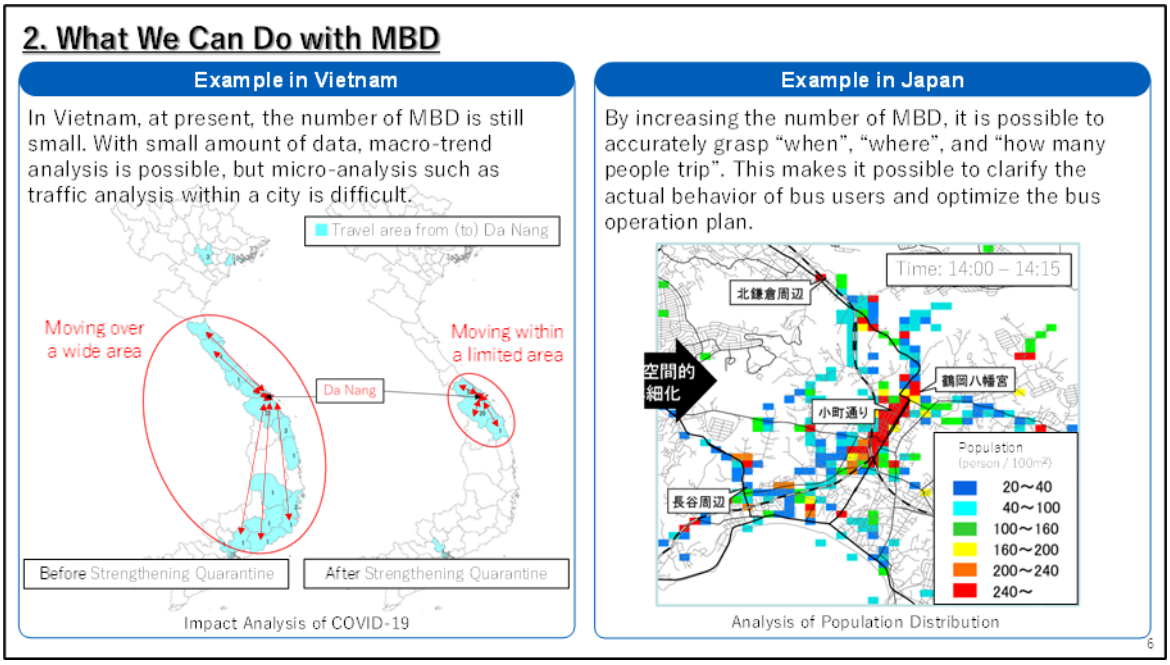


Figure 4-3 1st Meeting Material Part 3

3. Number of Samples Required in Bangkok

Number of Samples Required

- In other cities, a sample of 1 % of the population of that city is collected and used for various analysis.
- The population of Bangkok is approximately 5.68 million => approximately 60,000 samples are required.
- The number of samples required for bus operation planning will be studied in this project.

Cooperation Request

- Cooperation from the app vendor is required to collect the data.
- We would like MOT to request the app vendor to cooperate with the data collection.

App Name we want you to introduce	ViaBus
Developer	BMTA, Chulalongkorn University
The number of app user	Approximately 150,000 people (iOS: 70,000, Android: 80,000)
Outline	Real-time public transport bus tracking and navigation app in Thailand

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4. Location Information

Japan (PDPA)

Article 2
"Personal information" in this Act means that information relating to a living individual which falls under any of each the following item:
(i) Those containing a name, date of birth, or other descriptions etc. whereby a specific individual can be identified.
(ii) Those containing an individual identification code

Agoop SDK
- Not acquire other than location information
- Data ID changes day by day
- Cannot be linked with other data

⇒It does not correspond to personal information because it cannot identify an individual.

Thailand (PDPA)

Section 6 In this Act,
"Personal Data" means any information relating to a Person, which enables the identification of such Person, whether directly or indirectly, but not including the information of the deceased Persons in particular;

Same as in Japan, we think that location information data alone does not correspond to "personal data".

We will comply with the law of Thailand

8

Figure 4-4 1st Meeting Material Part 4

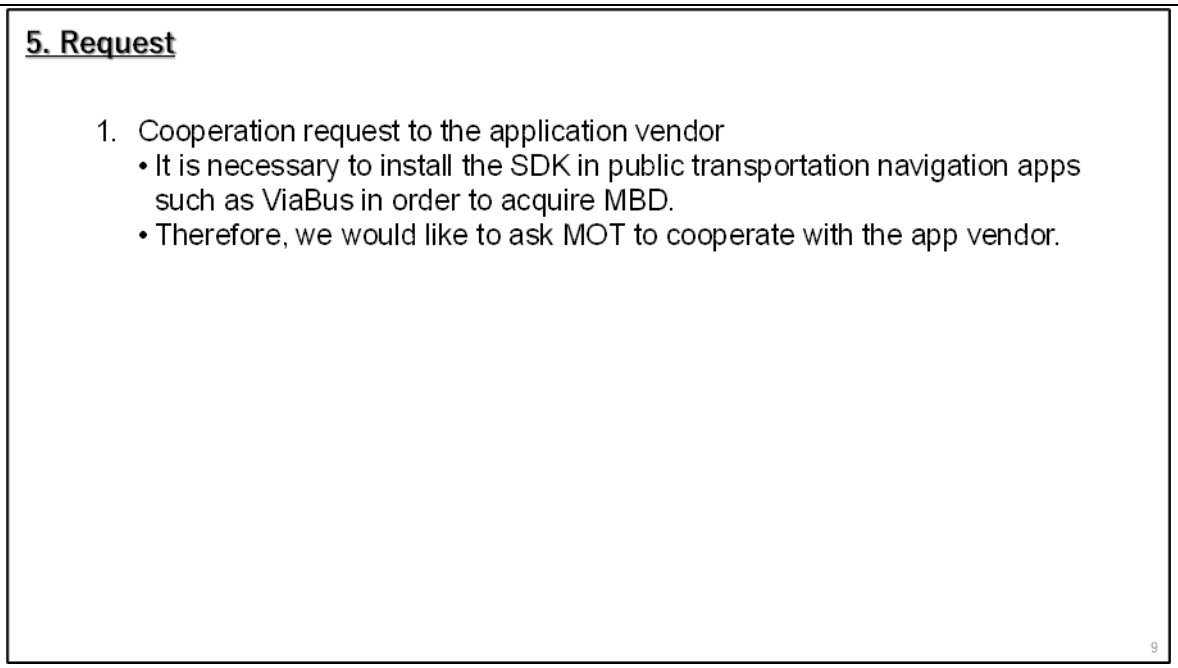


Figure 4-5 1st Meeting Material Part 5

4.2.2 Second Meeting: Meeting with Deputy Permanent Secretary

(1) Participants

1) Thai side: MOT Meeting Room

●MOT

- Mr. Sorapong Paitoonphong, Deputy Permanent Secretary

●OTP

- Mr. Ruengdej Mangkorndejsakul, Plan and Policy Analyst

●ICTC

- Ms.Sukanya Director

●BMTA

- Miss Sukanya Meebangkoed, two others

●DLT

- 2 staffs

●ViaBus

- Mr.Intouch MarsvongpragornSudthida, Co-founder and CEO, Ms. Marsvongpragorn, Business Development

2) Japan side: MOT Meeting Room

●Embassy of Japan in Thailand

- Yukihisa Hirose, First Secretary

●Nippon Koei Co., Ltd.

- Nozomi Hishida

●Interpreter

- Mrs. Weeranuch Kamolrungvarakul

3) Japan side: Online Meeting

●International Policy Division, Policy Bureau, Ministry of Land, Infrastructure and Transportation (MLIT)

- Toshihiro Yamakoshi, Yasuaki Uchino, Kunio Takeda, Toru Shimano

●Nippon Koei Co., Ltd.

- Hisanari Ushirooka, Atsushi Mochizuki, Hiroya Totani, Shuei Yamada

●Softbank Corp.

- Mao Matsumoto

●Agoop Corp.

- Syuhei Maruyama, Mikio Fujii

(2) Summary of Discussion

1) Th data should be collected using Namtang, which is an application owned by OTP, because ViaBus is a private app. The Japan side will consider the availability of NAMTANG.

2) Next meeting will be held two weeks later, and the above matter will be discussed between Japan and Thailand by the next meeting.

(3) Meeting Material

The meeting materials are shown below.

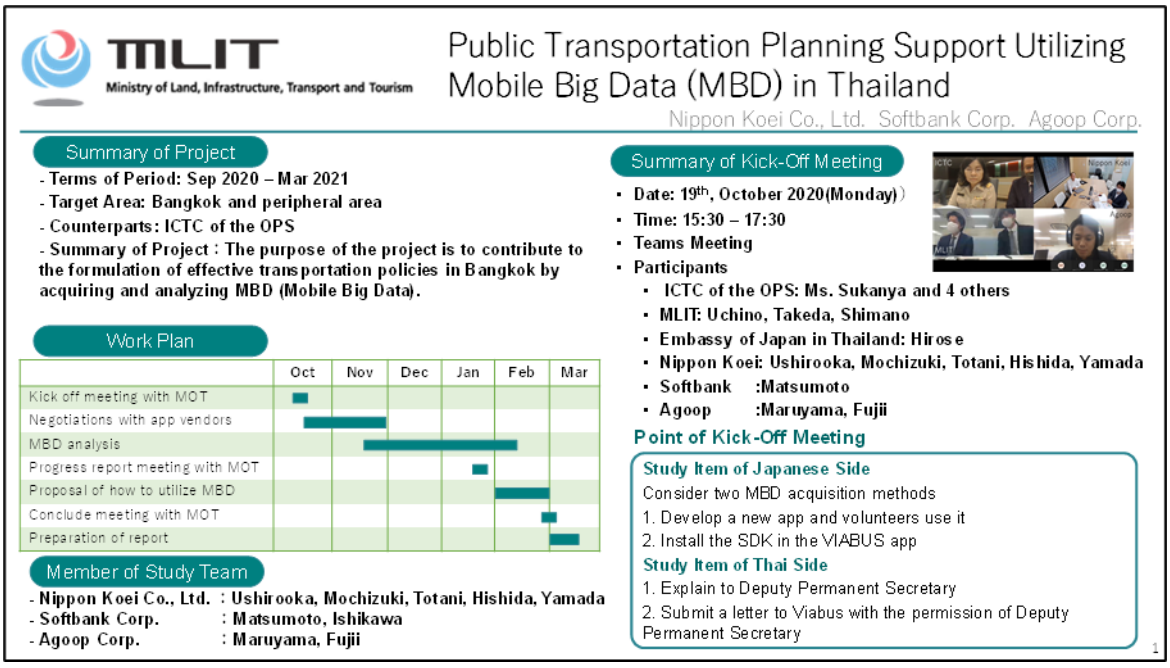
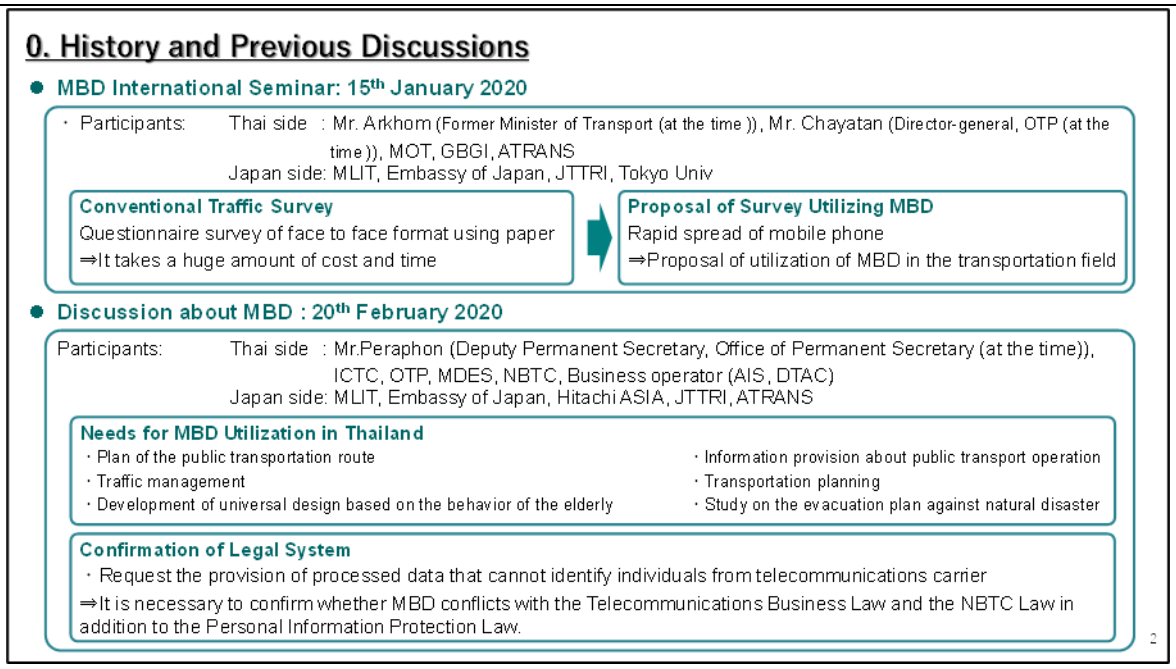


Figure 4-6 2nd Meeting Material Part 1



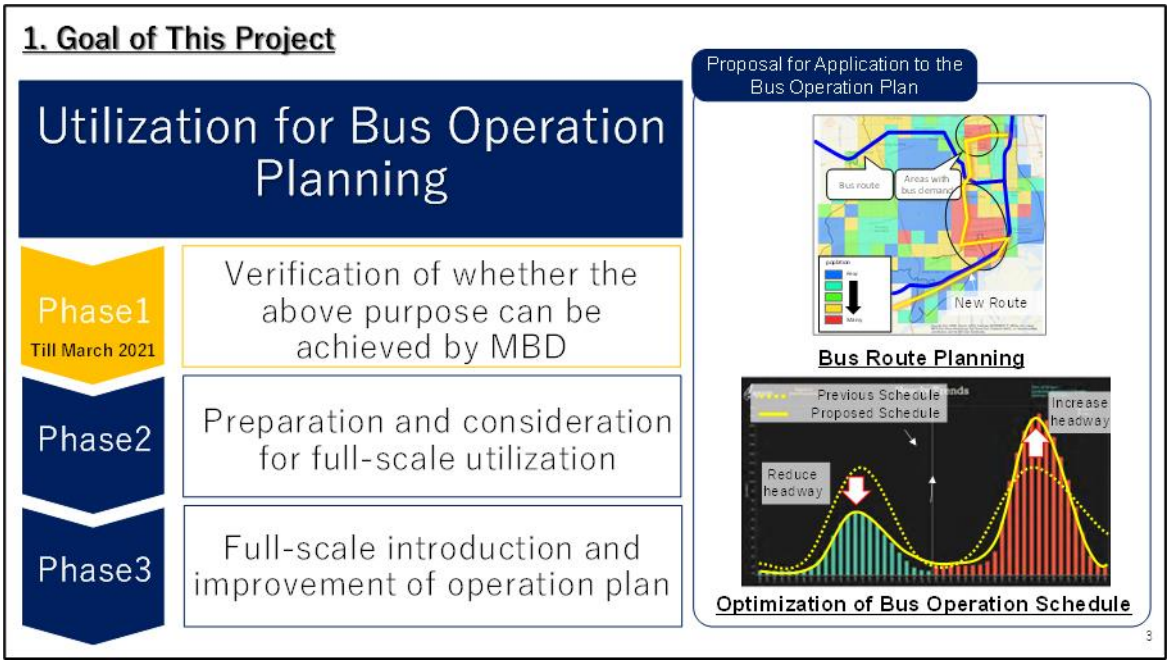


Figure 4-7 2nd Meeting Material Part 2

2. Report of Considerations on Japan Side

Comparation of MBD Acquisition Methods

Comparison Item	Review of last year: MBD provided by telecommunications carrier	Option 1: New app development	Option 2: Installation of SDK in Viabus app
Development Cost	None	High	None
Development Period	None	Long	None
Server	No need	Need to be installed	Already installed
PDPA	Violates the law	Not corresponding*1	Not corresponding*1
NBTC Law	Violates the law	Not corresponding*1	Not corresponding*1
Data Acquisition	Much	Little	Cooperation of app vendor is required
Analytical Resolution	High	Low	High
Evaluation	Not possible as it violates PDPA and NBTC laws	Data acquisition is limited, and therefore effective analysis is impossible. Development is costly and time consuming as well.	Data can be acquired immediately with the cooperation of the app vendors
	×	△	○

⇒It is recommended to install the SDK in the existing app and collect data at the Phase 1 of the Verification Stage*2

*1: Our understanding of the legal system for handling MBD based on the letter from MEDS and NBTC to MOT
*2: The final acquisition method (i.e. new application development or SDK utilization) will be considered after this verification is completed and full utilization is determined.

4

3. Mechanism of SDK

MBD acquisition method utilizing SDK

SDK features
① It is possible to acquire only location information (with latitude and longitude)
- Location information alone is not corresponded to PDPA
② MBD can be acquired not through a telecommunication carrier
- Not correspond to telecommunication business law 2001 and NBTC law

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Figure 4-8 2nd Meeting Material Part 3

4. Our Understanding of the Legal System in Regard of MBD Handling

JAPAN (PDPA)

Article 2
"Personal information" in this Act means that information relating to a living individual which falls under any of each the following item:
(i) Those containing a name, date of birth, or other descriptions etc. whereby a specific individual can be identified.
(ii) Those containing an individual identification code

Agoop SDK
- Not acquire other than location information
- Data ID changes day by day
- Cannot be linked with other data

⇒It does not correspond to personal information because it cannot identify an individual.

Thailand (PDPA)

Section 6 In this Act,
"Personal Data" means any information relating to a Person, which enables the identification of such Person, whether directly or indirectly, but not including the information of the deceased Persons in particular;

Out understanding

MBD collected via SDK is only the location data, and it does not include the information which leads to identify the individual person.
⇒ MBD collected via SDK will NOT be the subject of PDPA

6

5. Answer to Concerns

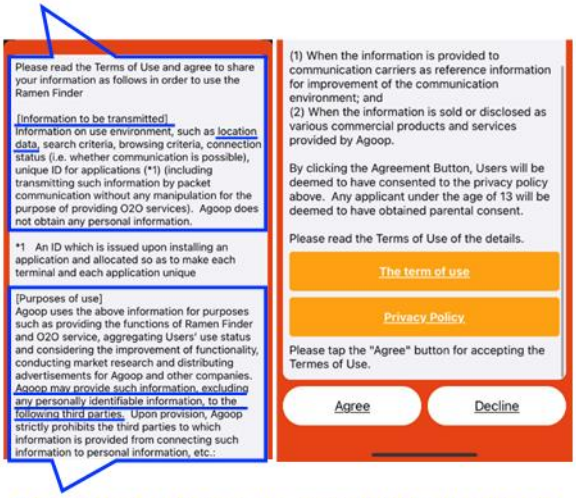
1	**SDK source code disclosure** ⇒Disclosure is possible ⇒Since it is the basis of Agoop business, we would like to limit the number of people who can view the source code after concluding a non-disclosure agreement.
2	**NOT releasing data outside Thailand** ⇒There is no AWS* region in Thailand that Agoop builds and uses as a foundation to ensure security. Therefore, we would like to use a server outside Thailand. ⇒We consider that there is no problem to take data out from Thailand for the following reasons (1) Location information is not subject to the PDPA because it can't be identified an individual by itself (refer to the pages 5 and 6). (2) Some app that are widely used by many people in Thailand, acquires location information and operated using overseas servers(refer to the pages 9). (3) Although location information is not personal information, from the viewpoint of privacy protection, data will not be used without the agreement on the acquisition and provision to a third party from app users(refer to the pages 8).

※AWS = Amazon Web Services 7

Figure 4-9 2nd Meeting Material Part 4

5. Answer to Concerns (Obtaining Agreement)

Stating that location information will be acquired



Stating that data may be provided to a third party

- The pop-up appears after installing the application.
- Only the data those who have agreed to the acquisition and provision to a third party is used.

There is no problem with the legal system and the consent of the user has been obtained, so it can be used with confidence.

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5. Answer to Concerns (Example of Service Utilizing Location Information in Thailand)

(1) Grab (taxi app)

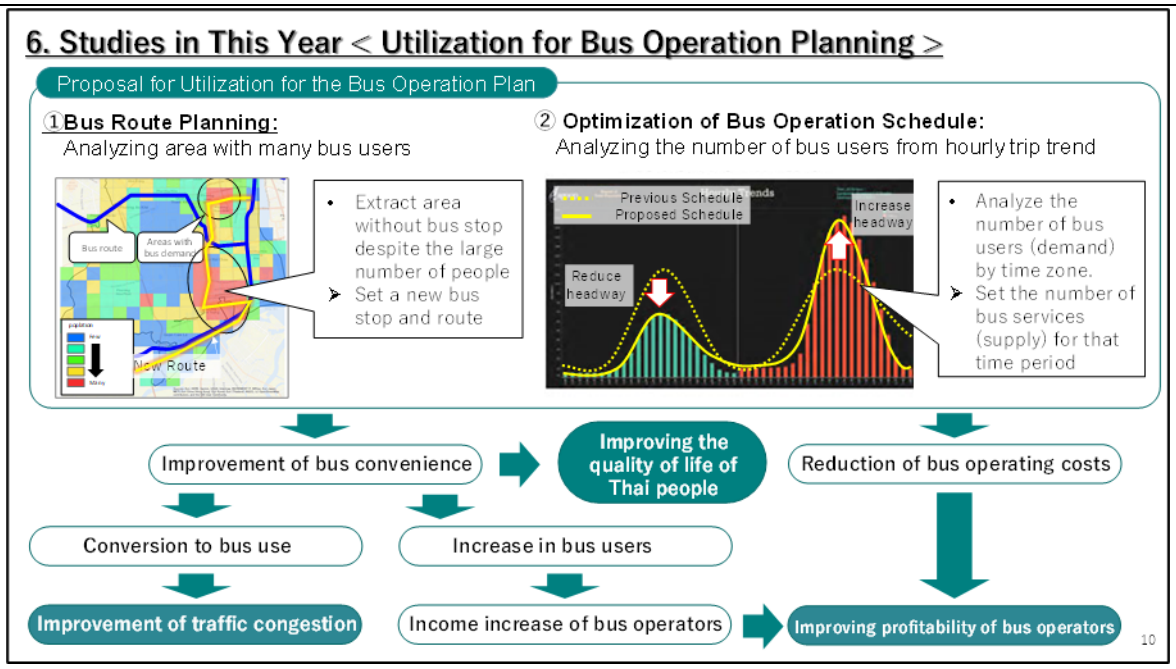
- The location information is also acquired by Grab (taxi app) which is generally used in Thailand
- Grab is developing a service that enhances the convenience of Thailand people by using server outside Thailand based on AWS like Agoop.

(2) Google Map

- Google Map also acquires the location information and provide services such as driving route search and web searching including current location information.
- Google is developing a service that enhances the convenience of Thailand people by using server outside Thailand like Agoop.

9

Figure 4-10 2nd Meeting Material Part 5



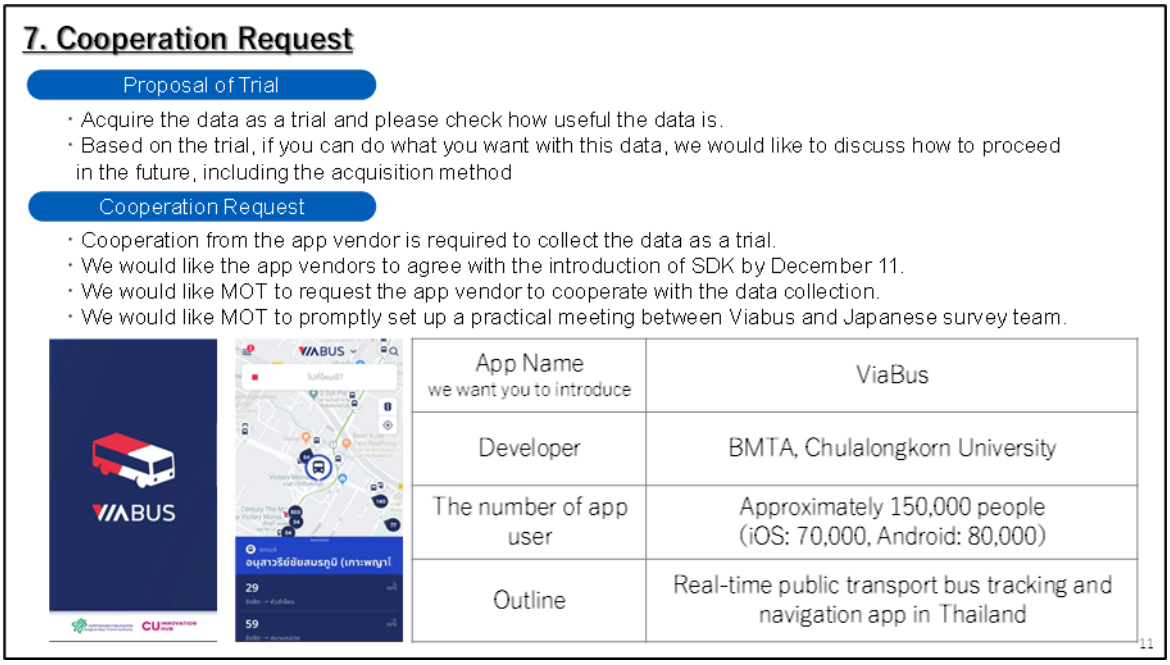


Figure 4-11 2nd Meeting Material Part 6

4.2.3 Third Meeting: Confirmation of Namang

(1) Participants

1) Thai side: MOT Meeting Room

●OTP

- Mr. Ruengdej Mangkorndejsakul, Plan and Policy Analyst

●ICTC

- Ms.Sukanya Director

●MOT International Affair Division

- Ms. Ilada Pongpattanagorn, Transport Technical Officer

2) Japan side: MOT Meeting Room

●Nippon Koei Co., Ltd.

- Nozomi Hishida, Wachira Jongkittipong, Naecharin Chaisunan

3) Japan side: Online Meeting

●International Policy Division, Policy Bureau, Ministry of Land, Infrastructure and Transportation (MLIT)

- Yasuaki Uchino, Kunio Takeda, Toru Shimano

●Nippon Koei Co., Ltd.

- Hisanari Ushirooka, Atsushi Mochizuki

●Softbank Corp.

- Mao Matsumoto

●Agoop Corp.

- Syuhei Maruyama, Mikio Fujii

(2) Summary of Discussion

1) Location information of Namtang app users is acquired every minute, and log data has been stored on the OTP server since the start of operation in April 2019. An output image using this data will be presented.
2) It was confirmed that the experts will work in OTP to avoid releasing data outside Thailand as the policy of Mr. Sorapong Paitoonphong, Deputy Permanent Secretary.
3) What shall be done at the working-level will be reported to Mr. Sorapong Paitoonphong, Deputy Permanent Secretary.

(3) Meeting Materials

The meeting materials are shown below.

Previous Discussions

- **Discussion with MOT : 4th December 2020**

Participants: Thai side : Mr. Sorapong Deputy Permanent Secretary, OTP, ICTC, BMTA, DLT, ViaBus
Japan side: MLIT, Embassy of Japan,

About the Namtang App

・It was informed that the route search, distance and fare calculations are possible for all public transportations such as buses and metro.

Possibility of Namtang App

・It was confirmed that since ViaBus is private company app, the possibility of utilizing Nantang application owned by OTP will be studied.
・It was agreed that the next meeting will be held two weeks later. It was also agreed that the engineers from Thai and Japan sides will discuss and confirm the technical aspect of Namtang by the next meeting.

Remarks

・The Namtang App has 10,000 users per day. It is necessary to confirm whether the number of samples is sufficient for planning of public transportation.

2

Prior Confirmation Items regarding the Namtang App

1. Namtang App Data
   A) Is information acquired from Namtang App held / aggregated as data?

   B) If the answer to question A) is Yes,
      ① What kind of data are there?
      <Example of data useful for analysis>
      - Location information (latitude, longitude, time stamp)
      - Movement direction, speed
      - User ID
      - Route search history etc

      ② How many users can acquire?
      ③ At what timing and frequency (e.g. every 5 minutes while the app is running, only when route searching) can data be acquired?
      ④ When did you start acquiring data, how long is the data storage period and how many datasets are there?
      ⑤ What is the data format (e.g. CSV format)

   C) If the answer to question A) is No,
      ① What kind of method and format are you considering to hold and aggregate the Namtang App data?
      ② When will you start data holding?

2. Other Data
   A) Is there GIS data of the bus route and bus stop?

Figure 4-12 3rd Meeting Material

4.2.4 Forth Meeting: Technical Assistance

(1) Participants

1) Thai side: MOT Meeting Room

●OTP

- Mr. Ruengdej　Mangkorndejsakul, Plan and Policy Analyst
- Mr. Somchai Phunasi, Computer Technical Officer
- Mr. Chaiwat Thammasatitnukul, Plan and Policy Analyst
- Mr. Kittiphat Amalashthira, Plan and Policy Analyst
- Ms. Patcharee Suekkhayad, Plan and Policy Analyst

●ICTC

- Ms. Aompilai Manorat, Computer Technical Officer
- Mr. Sumate Vanaleesuksun, Computer Technical Officer

●MOT International Affair Division

- Ms. Ilada Pongpattanagorn, Transport Technical Officer

2) Japan side: MOT Meeting Room

●Nippon Koei Co., Ltd.

- Nozomi Hishida, Wachira Jongkittipong, Naecharin Chaisunan

3) Japan side: Online Meeting

●International Policy Division, Policy Bureau, Ministry of Land, Infrastructure and Transportation (MLIT)

- Yasuaki Uchino, Kunio Takeda, Toru Shimano

●Nippon Koei Co., Ltd.

- Hisanari Ushirooka, Atsushi Mochizuki, Hiroya Totani, Shuei Yamada

●Softbank Corp.

- Mao Matsumoto

●Agoop Corp.

- Syuhei Maruyama, Mikio Fujii

(2) Summary of Discussion

1) There is no problem in conducting technical assistance online.
2) There are GIS engineers in OPT and they can use QGIS.
3) It is not necessary to hold a meeting in January if MOT gives an explanation to Mr. Sorapong Paitoonphong, Deputy Permanent Secretary and consent is obtained.
4) It was agreed to prepare a proposal showing the analysis theme, period, and output image of technical assistance for explanation to Mr. Sorapong Paitoonphong, Deputy Permanent Secretary.

(3) Meeting Materials

The meeting materials are shown below.

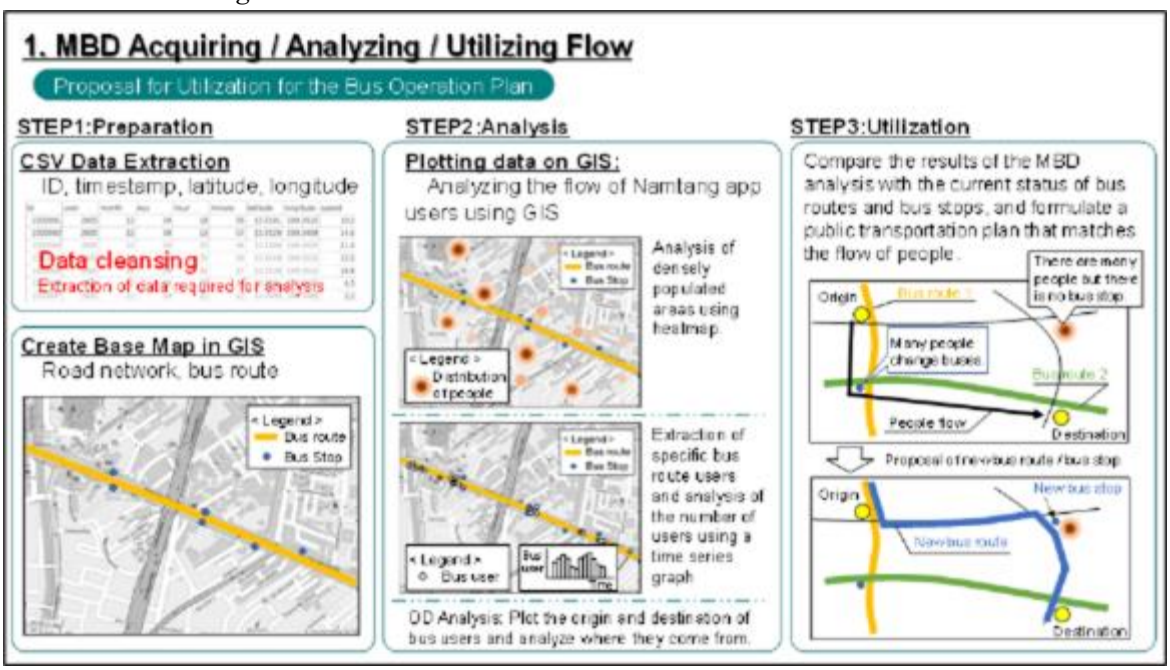


Figure 4-13 4th Meeting Material

4.2.1 Fifth Meeting: Summary of Technical Assistance

(1) Participants

1) Thai side: MOT Meeting Room

●OTP

- Mr. Ruengdej Mangkorndejsakul, Plan and Policy Analyst
- Mr. Somchai Phunasi, Computer Technical Officer
- Mr. Chaiwat Thammasatitnukul, Plan and Policy Analyst
- Mr. Kittiphat Amalashthira, Plan and Policy Analyst
- Ms. Patcharee Suekkhayad, Plan and Policy Analyst

●ICTC

- Ms. Aompilai Manorat, Computer Technical Officer
- Mr. Sumate Vanaleesuksun, Computer Technical Officer

●MOT International Affair Division

- Ms. Ilada Pongpattanagorn, Transport Technical Officer

2) Japan side: MOT Meeting Room

●Embassy of Japan in Thailand

- Yukihisa Hirose, First Secretary

●Nippon Koei Co., Ltd.

- Nozomi Hishida, Wachira Jongkittipong, Naecharin Chaisunan

3) Japan side: Online Meeting

●International Policy Division, Policy Bureau, Ministry of Land, Infrastructure

and Transportation (MLIT)

- Yasuaki Uchino, Kunio Takeda, Toru Shimano

●Nippon Koei Co., Ltd.

- Hisanari Ushirooka, Atsushi Mochizuki, Hiroya Totani, Shuei Yamada

●Softbank Corp.

- Mao Matsumoto

●Agoop Corp.

- Syuhei Maruyama, Mikio Fujii

(2) Summary of Discussion

1) The plan on how to utilize the Namtang app in the future was explained.
2) It was found that there is a problem with the quantity and quality of data for the Namtan app. It is necessary to consider how to utilize the data in the future.
3) It is not possible to identify the travel route. Therefore it shall be planned to analyze the travel route using existing data.
4) One of the achievements was that the Thai side understood that ensuring the quantity and quality of data was an issue through the examination of the use of the Namtan app.
5) The report will be shared with relevant parties in ASEAN countries because this initiative is carried out under the framework of ASEAN-JAPAN Transport Partnership.

(3) Meeting Materials

The meeting materials are shown below.

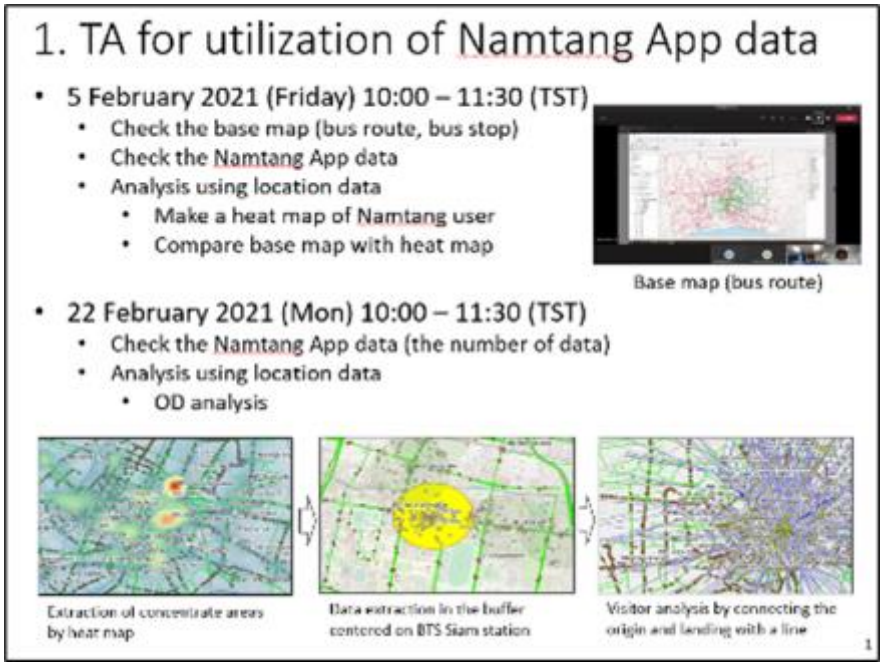


Figure 4-14 5th Meeting Material Part 1

2. Available Namtang Data Currently

- Route guidance data by Namtang App is available.
  - Date, Time, route guidance (origin, destination)

od_route (Route guidance list)		
No.	Column Name	Meaning
1	odId	Route guidance ID
2	uid	User ID
3	userAgent	Access Channel
4	update	Date and Time for route guidance
5	level	Level of route guidance 1= Not Navigation 2=Navigation
6	originLat	Origin Latitude
7	originLon	Origin Longitude
8	destinationLat	Destination Latitude
9	destinationLon	Destination Longitude
10	vehicleWalk	Walk mode true=use false=not
11	vehicleBus	Travel by Bus mode true=use false=not
12	vehicleTrain	Travel by Train mode true=use false=not
13	vehicleMetro	Travel by Metro mode true=use false=not
14	vehicleFerry	Travel by Ferry mode true=use false=not
15	distance	Distance (only level 2= press navigation)
16	interval	Travel time (second)(only level 2= press navigation)
17	price	Travel Fares (only level 2= press navigation)
18	session	Access Code

Most of data was 1=Not Navigation

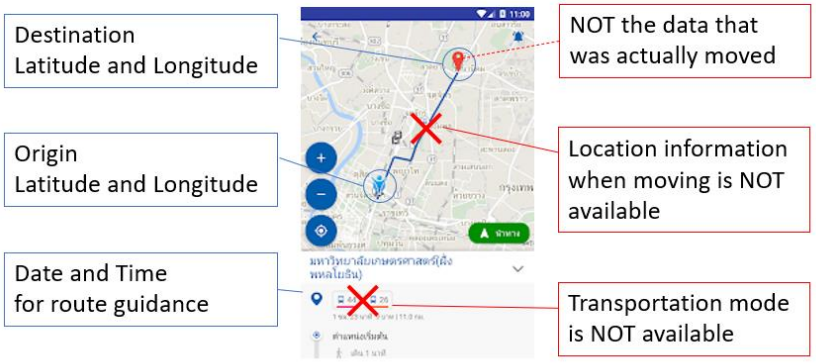
Available date
- Date
- Time
- Origin
- Destination

Only level 2

2

2. Available Namtang Data Currently

- Route guidance data by Namtang App is available.
  - Date, Time, Origin, Destination
  - It is route guidance data, **NOT real location data**.



3

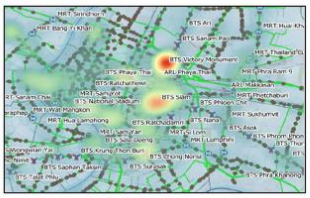
Figure 4-15 5th Meeting Material Part 2

3. Utilization of Namtang Data

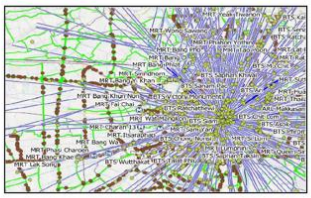
- Analysis using the available data currently

Origin & Destination
Latitude and Longitude

<Heat Map>
Analysis of the distribution of origin point and destination point using heat map

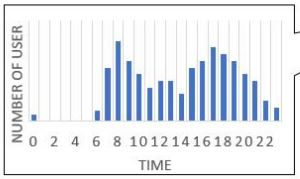


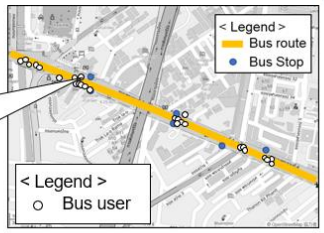
<OD Analysis>
Analysis of direction and quantity of movement needs by connecting OD with line.



Date and Time
for route guidance

Time series analysis of users at the bus stop





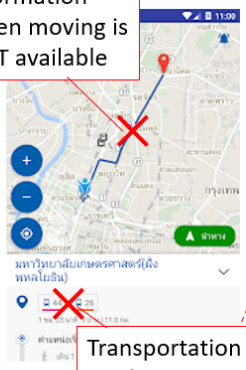
4

3. Utilization of Namtang Data

- Various analyzes are possible by increasing the types of data to be acquired.

NOT available data currently ⇨ If MOT acquired these data

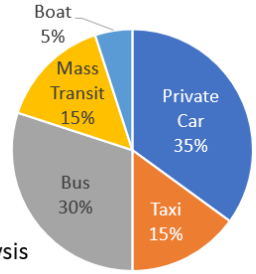
Location information when moving is NOT available



Transportation mode is NOT available

Location information

- Transport route analysis
- Detailed OD analysis
  - ✓ Origin before boarding the bus
  - ✓ Destination after alighting the bus
- Analysis of the number of bus route users by time zone
- Modal share analysis
  - ✓ Demand by mode
  - ✓ Route by mode



Modal share analysis

5

Figure 4-16 5th Meeting Material Part 3

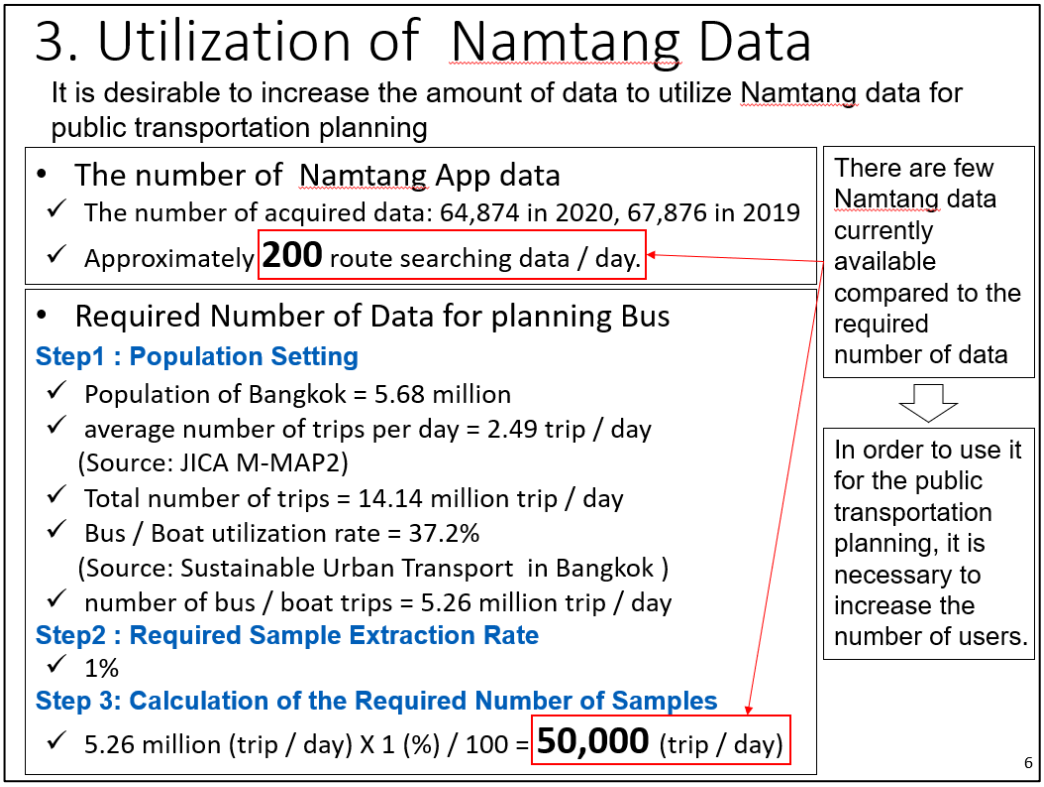


Figure 4-17 5th Meeting Material Part 4

4.3 Situations and Needs for Utilization of MBD in the Transportation Field

4.3.1 Situations for Utilization of MBD in the Transportation Field

It was confirmed in the meetings with OTP and ICTC that Namtang's data has not yet been utilized in the transportation field.

4.3.2 Needs for Utilization of MBD in the Transportation Field

Mr. Sorapong Paitoonphong, Deputy Permanent Secretary outlined the following needs in the meeting with MOT.

- Thai government wishes to be as independent as possible, and to utilize Namtang, an application in which the government is involved rather than the private sector.
- They wish to learn together how to proceed to utilize MBD in the field of public transportation.
- They wish Japan side to consider temporarily dispatching personnel to OTP for technical assistance to transfer knowledge to the Thai side.

Based on the above needs, technical support using Namtang's data was provided. The contents of technical support are shown in Chapter 5.

5. MBD Acquisition and MBD Analysis

5.1 MBD Acquisition Method

5.1.1 MBD Acquisitino using Agoop SDK (Initial Proposal)

(1) Outline of Agoop SDK

It was proposed to utilize Agoop SDK (Software Development Kit), which is a technology developed by Agoop. SDK is a kit installed in an application to acquire MBD. As shown in Figure 5-1, it is possible to acquire the latitude / longitude / time / speed / direction information via a smartphone app that has the Agoop SDK installed. This data can be used as continuous data.

Negotiations with app vendors are required to install the SDK in smartphone app.

Figure 5-1 Outline of Agoop SDK

(2) Result of Discussion with MOT

Discussion was held with MOT regarding installation of Agoop SDK in ViaBus (see 2.2.1), a bus navigation app. However, ViaBus is a private company and no consent was obtained.

5.1.2 MBD Acquisition using Namtang App

(1) Result of Discussion with MOT

Mr. Sorapong Paitoonphong, Deputy Permanent Secretary, introduced Namtang, a public transportation navigation app under the jurisdiction of MOT. Currently, Namtang has about 10,000 daily users and is growing day by day. Thai government would like to be as independent as possible, and it has been proposed to utilize apps involving the government rather than apps from private companies.

(2) Outline of Namtang

Location information of Namtang users is acquired every minute, and log data has been stored on the OTP server since the start of operation in April 2019. However, the latitude / longitude and time stamp cannot be obtained unless the app is open.

Table 5-1 shows the contents of the route search history data, which is the data that can be acquired by Namtang. The data is recorded in CSV format.

The number of people who can use Namtang at the same time is about 60,000. However, only 300 people can press the search button at the same time.

Table 5-1 Acquirable Data by Namtang (Route Search History data)

OD_route (Route guidance list)		
No.	Column Name	Meaning
1	Odld	Route guidance ID
2	Uid	User ID
3	userAgent	Access Channel
4	Update	Date and Time for route guidance
5	Level	Level of route guidance 1= Not Navigation 2=Navigation
6	originLat	Origin Latitude
7	originLon	Origin Longtitude
8	destinationLat	Destination Latitude
9	destinationLon	Destination Longtitude
10	vehicleWalk	Walk mode true=use false=not
11	vehicleBus	Travel by Bus mode true=use false=not
12	vehicleTrain	Travel by Train mode true=use false=not
13	vehicleMetro	Travel by Metro mode true=use false=not
14	vehicleFerry	Travel by Ferry mode true=use false=not
15	Distance	Distance (only level 2= press navigation)
16	Interval	Travel time (second)(only level 2= press navigation)
17	Price	Travel Fares (only level 2= press navigation)
18	Session	Access Code

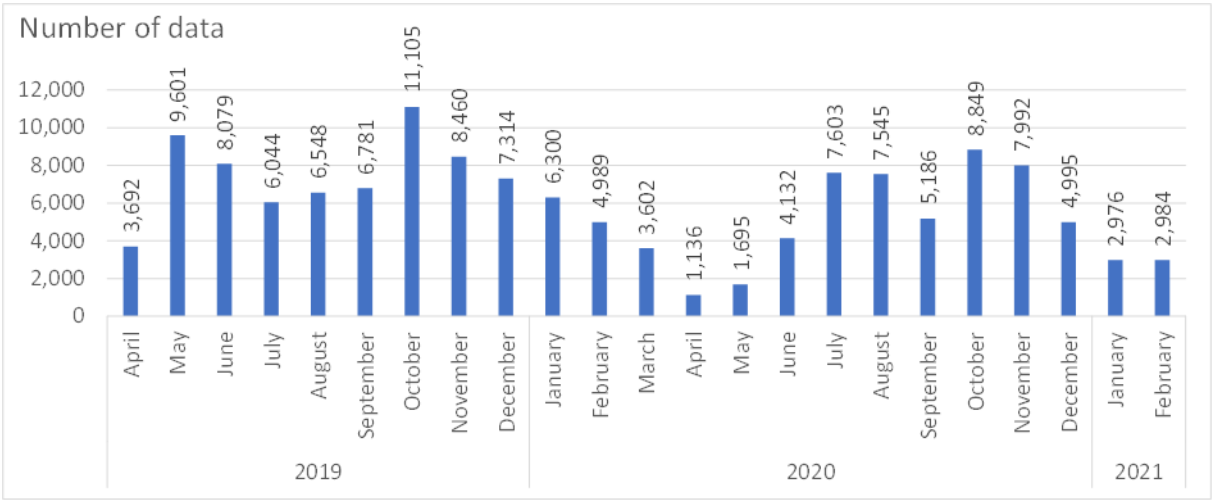
Source: OTP

5.2 MBD Acquisition Result

5.2.1 MBD Acquisition Results by Namtang App

(1) Amount of Acquired Data

Figure 5-2 shows the transition of the amount of Namtang data. Data acquisition started in April 2019, and the amount of data is the largest at 11,105 in October 2019. However, due to the influence of COVID-19, the data has decreased, and it was the lowest from April to May when the state of emergency was announced.



Source: OTP

Figure 5-2 Transition of the Amount of Namtang Data

(2) Contents of Acquired Data

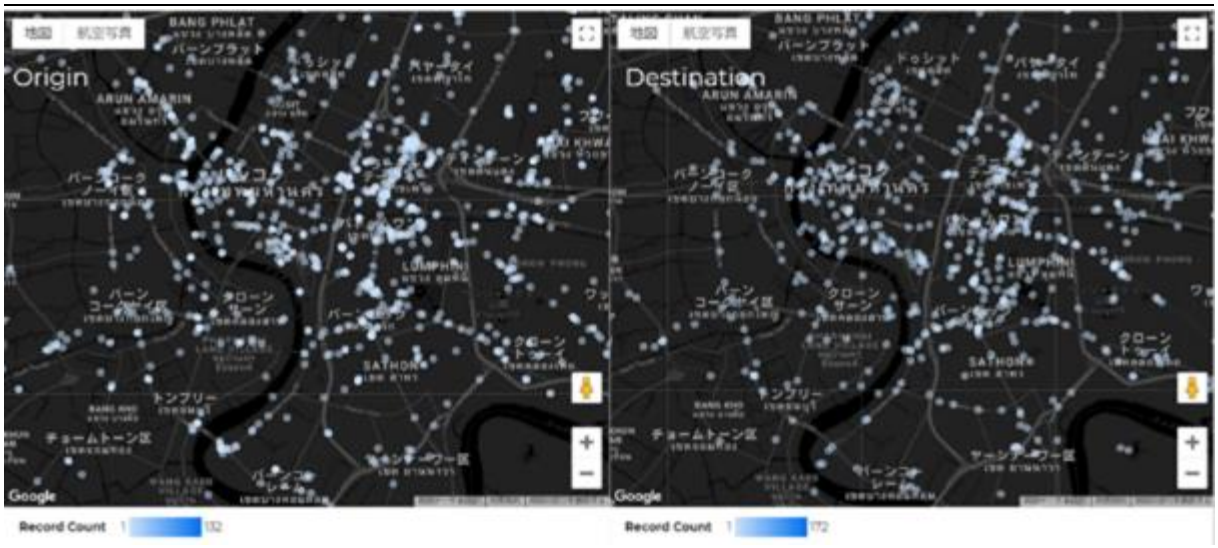
Contents of Namtang's route search history data shown in Table 5-1 were acquired. Regarding Level of No.5, if the value is 1, it is the data of the user who closed the app immediately after route search. Therefore, only the latitude / longitude information and the searched time data are recorded as data. If the Level value is 2, the user has confirmed the detailed information after the route search. Therefore, required time, distance, and fare, which are the search results, are recorded.

Most Namtang users closed the app immediately after searching the route. Therefore, the data that can be used are the location information (latitude and longitude) and the searched time data.

(3) Distribution of Acquired Data

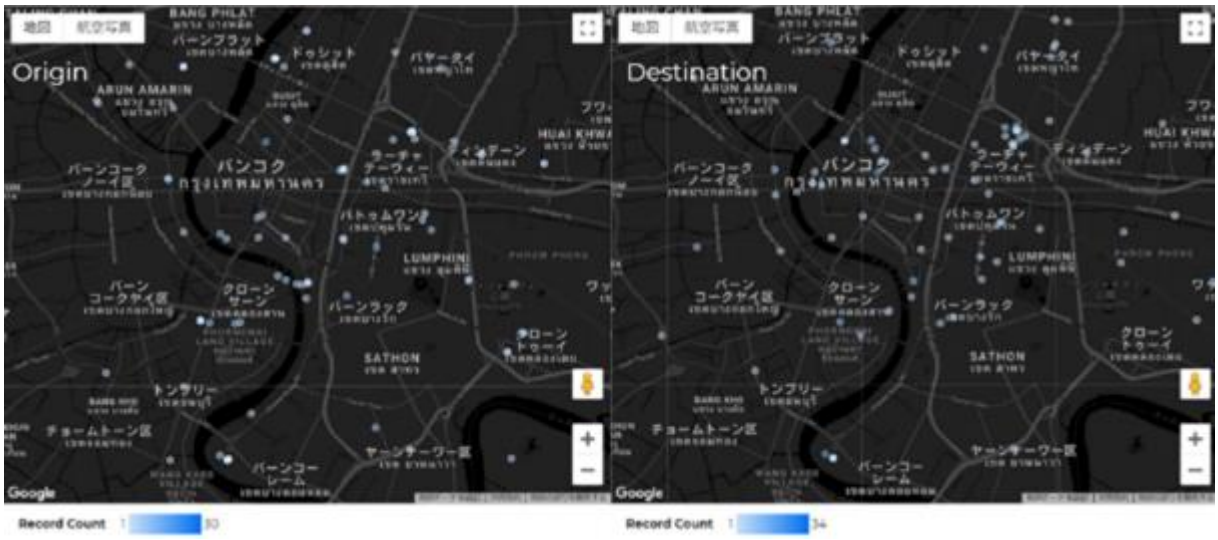
Using Namtang's location information, the data distribution of the origin and destination point of the route search was compared between October 2019, which has the largest amount of data, and April 2020, which has the least amount of data. Figure 5-3 and Figure 5-4 show the distribution of Namtang data.

In April 2020, it can be visually confirmed that the amount of going out has decreased due to the impact of COVID-19.



Source: OTP

Figure 5-3 Data Distribution of Namtang (October 2019, amount of data: 11,105)



Source: OTP

Figure 5-4 Data Distribution of Namtang (April 2020, amount of data: 1,136)

5.3 MBD Analysis Method and Results

In the technical assistance to OTP, MBD analysis method was introduced and MBD analysis was carried out together. The Table 5-2 outlines the technical assistance for OTP.

Table 5-2 Summary of Technical Assistance

	Data and Time	Contents	Participants
1	February 5, 2021, Friday 12:00 - 13:30	< 1st Technical Assistance > 1.Confirmation of base data 2.Confirmation of location information of Namtang app 3.Analysis of location information 4.Future consideration	● OTP ● ICTC
2	February 22, 2021, Monday 12:00 - 13:30	< 2nd Technical Assistance > 1.Confirmation of location information of Namtang app 2.Analysis of location information 3.Future consideration	● OTP

The MBD analysis method and its results in the technical assistance for OTP are explained below.

5.3.1 1st Technical Assistance

(1) Contents of Technical Assistance

1) Confirmation of Base Data

The bus routes and bus stops in Bangkok were organized as GIS data as shown in Figure 5-5.

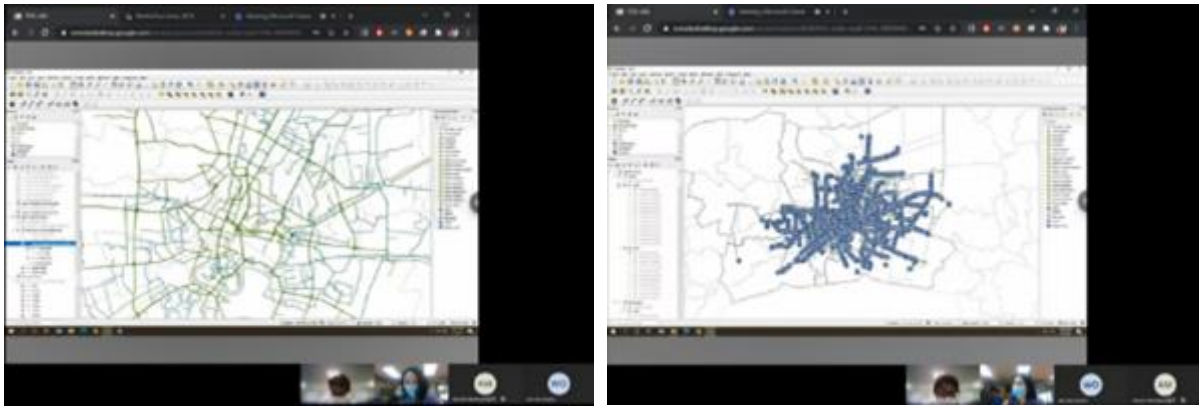


Figure 5-5 Bus Route Data (Left Figure) and Bus Stop Data (Right Figure)

The route name, destination display, bus type, etc. were input as the attribute data of the bus route. However, there was no data showing the traffic volume of buses such as the frequency of bus operations. For the attribute data of the bus stop, the bus route and the name of the bus stop were input.

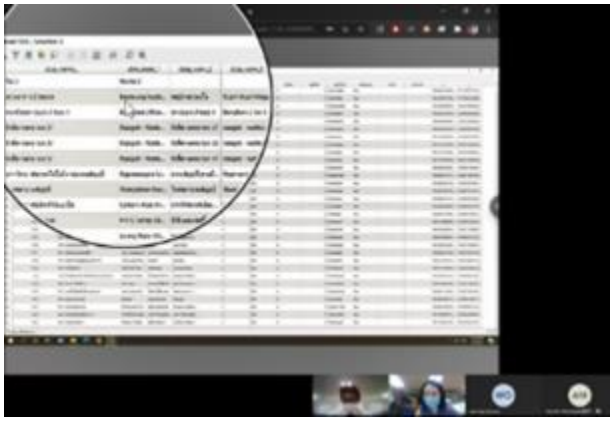


Figure 5-6 Confirmation of Bus Stop Attribute Table

2) Confirmation of Location Information of Namtang App

Location information of Namtang app was plotted on the base map shown in Figure 5-5 and the contents were confirmed. Plot position is the location where the route was searched, and the attribute information was latitude and longitude of the origin and destination points, vehicle type, distance, required time, and fare, all of which are route search results (the same as the route search history data shown in Table 5-1).

Functionally, the Namtang app can acquire location information every minute, but it has not been acquired at this time.

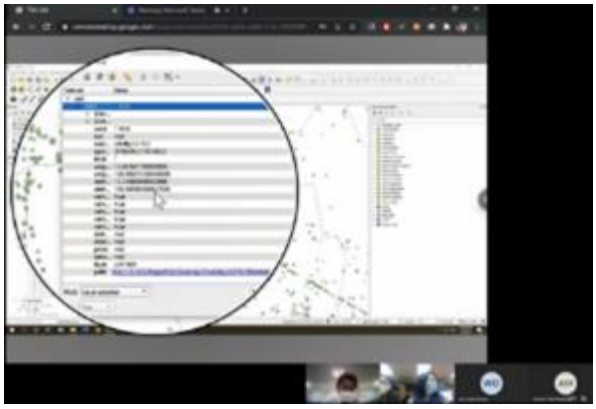


Figure 5-7 Confirmation of Namtang App Data

3) Analysis of Location Information

(i) Explanation of Analysis Method Using Base Data

It was explained that the bus service level can be visually confirmed by adding the frequency of buses on each route to the attribute data of the road, converting it to the bus traffic volume per day, and displaying the thickness of the road according to the volume.

(ii) Creating a Heat Map Using Location Information

It was explained how to create a heat map from the location information plotted on the base map. After creating the heat map, the points where location information is concentrated was confirmed. As a result, latitude and longitude of origin and destination were concentrated in the Victory Monument in the center of Bangkok. The Victory Monument is a transportation hub which connects BTS and many buses. Therefore, many Namtang users searched for routes to their destinations here. Location information was concentrated at transfer bases where many other people are expected to search for routes.

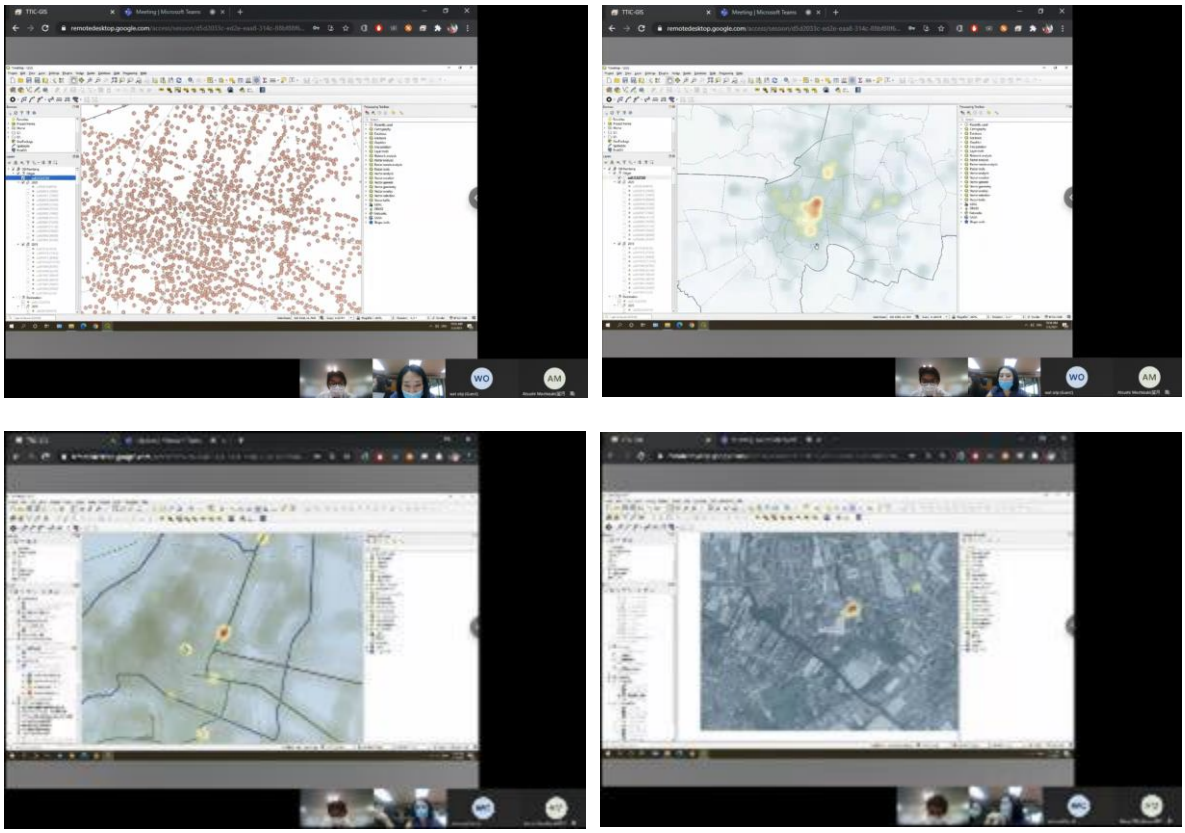


Figure 5-8 Plotted Location Information and Heatmap

(iii) Overlaying Heatmap on Bus Service Area

In order to confirm whether there are Namtang users outside the bus service area, 500m buffer was created around the bus stop data and overlaid the heatmap (Figure 5-9).

However, there was no concentration of Namtang users outside the bus service area. The reason may be that most people use the Namtang app around the bus stop, so the location data of the bus service blank area cannot be obtained.

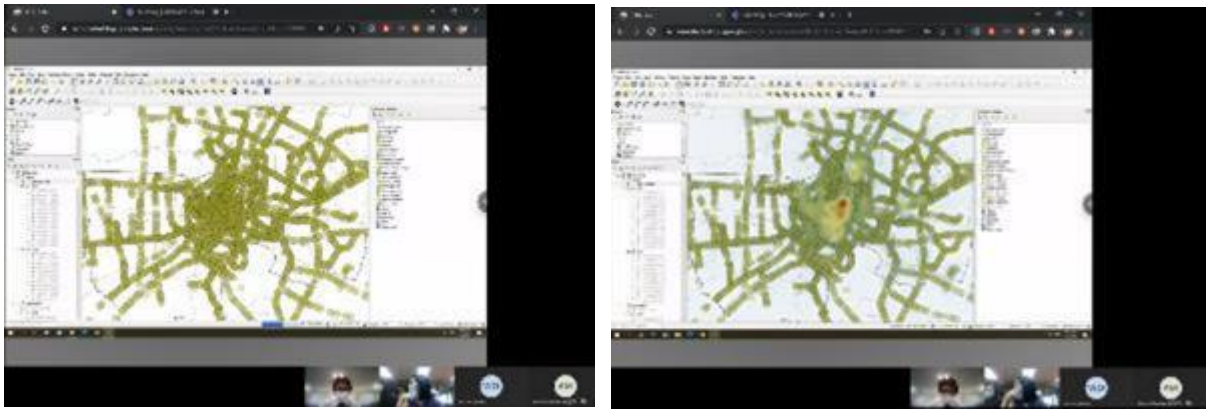


Figure 5-9 Overlay Heatmap on Bus Service Area

(2) MBD Analysis Method Manual

A manual for the MBD analysis method was prepared and shared in advance for the first technical assistance.

1) Installation of QGIS

A QGIS was downloaded and installation manual of QGIS was prepared to provide technical assistance using QGIS as shown below.

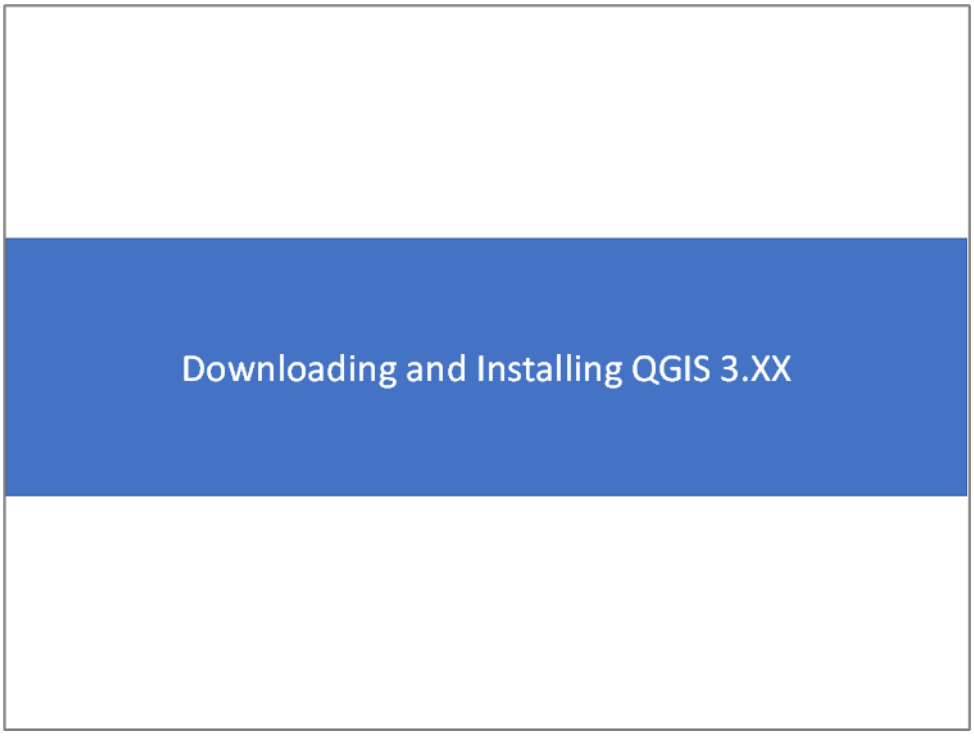
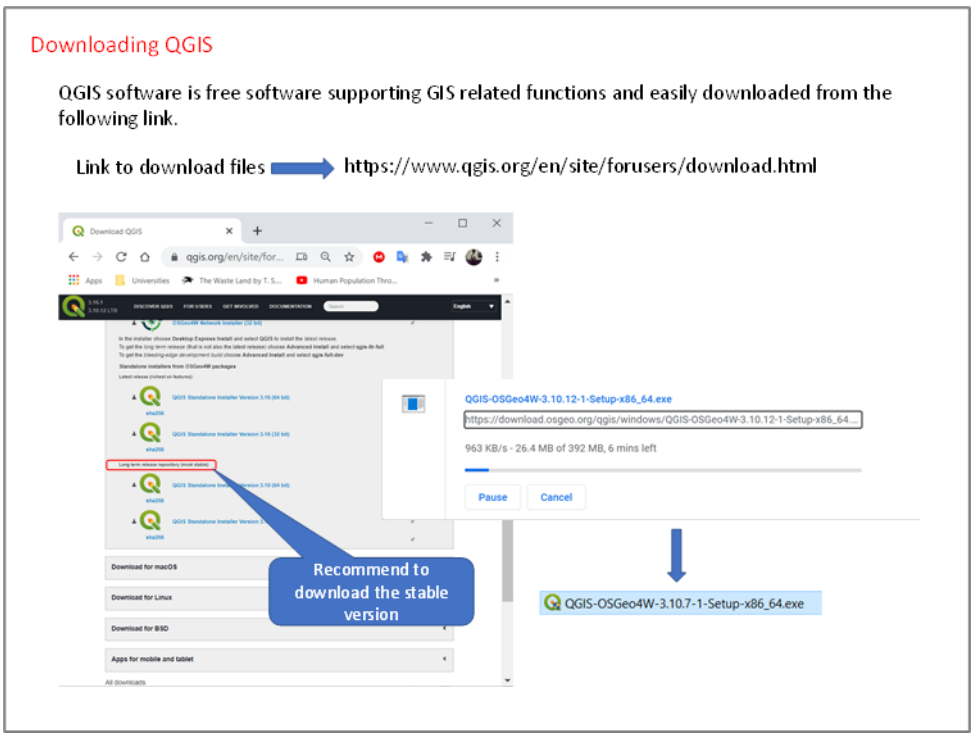


Figure 5-10 QGIS Download and Installation Manual Part 1



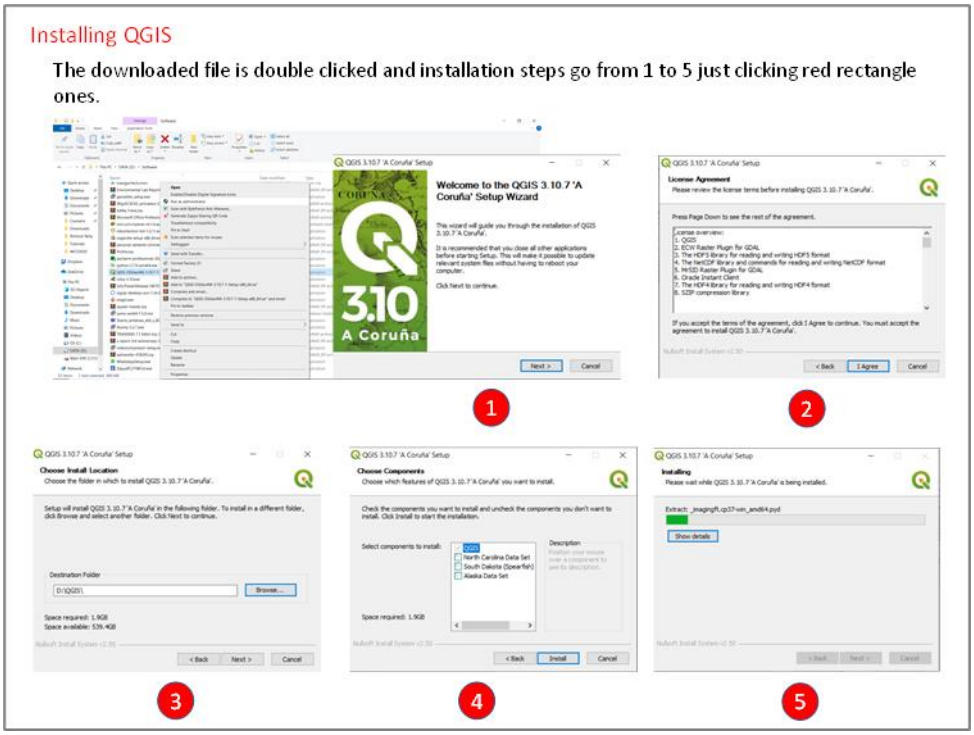


Figure 5-11 QGIS Download and Installation Manual Part 2

Figure 5-12 QGIS Download and Installation Manual Part 3

2) Creating Base Map

A manual to create a base map (bus stop / bus route) using QGIS was prepared as shown below.

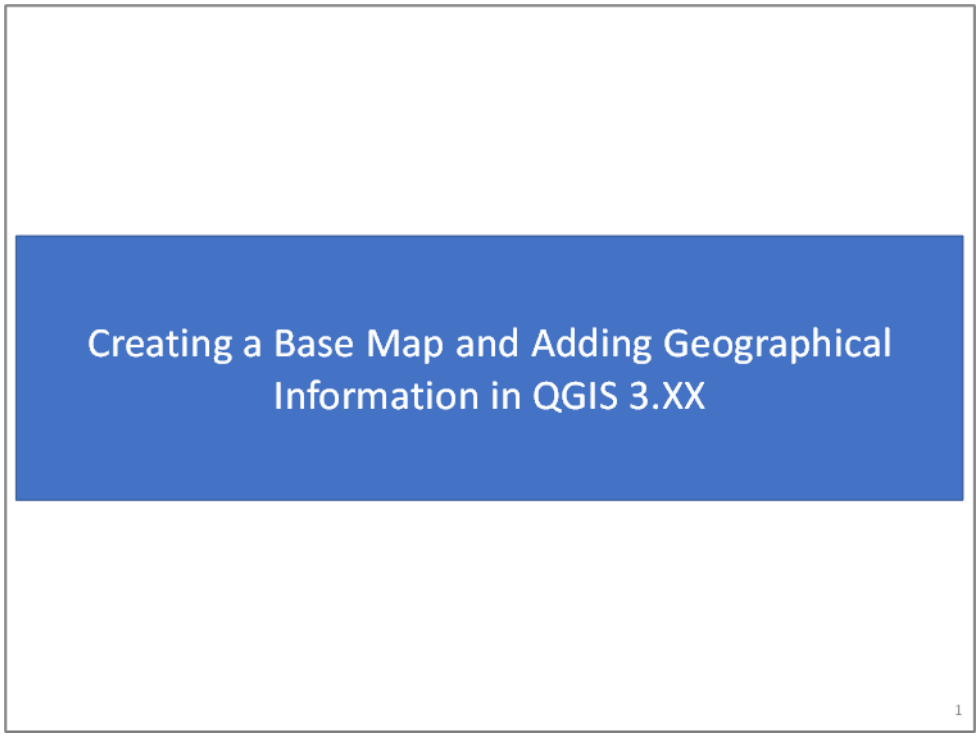
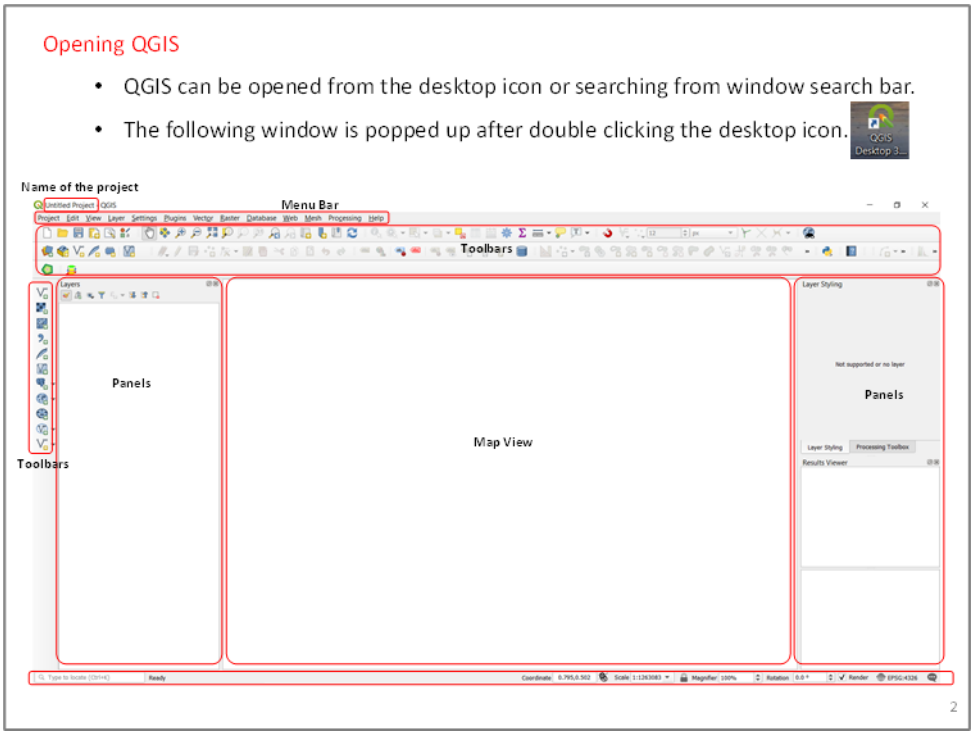


Figure 5-13 Base Map Creation Manual Part 1



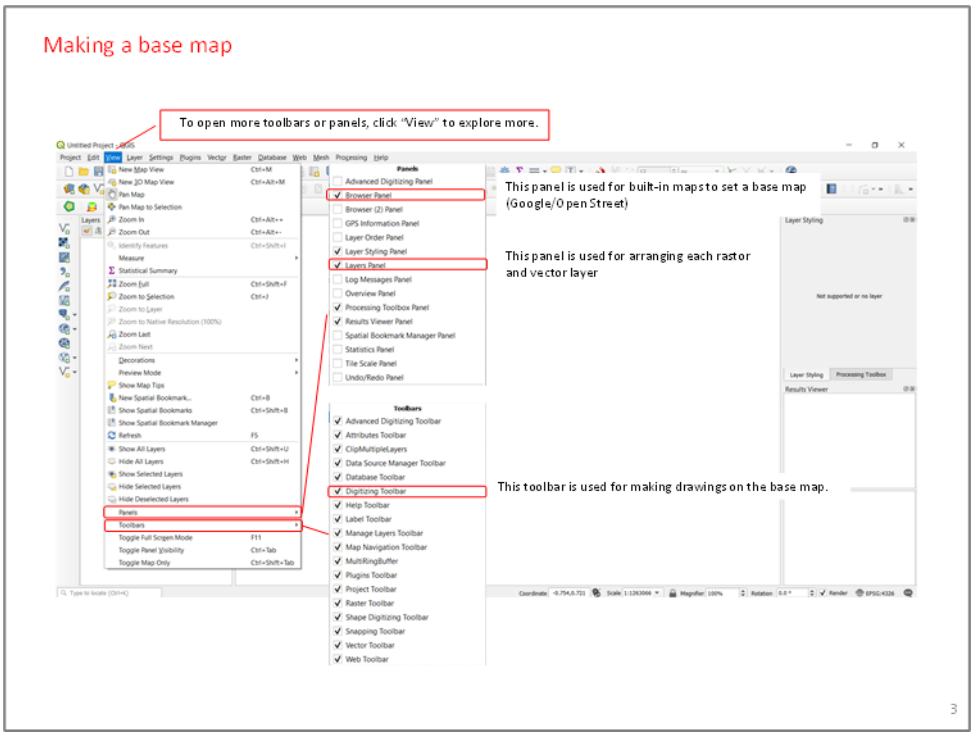
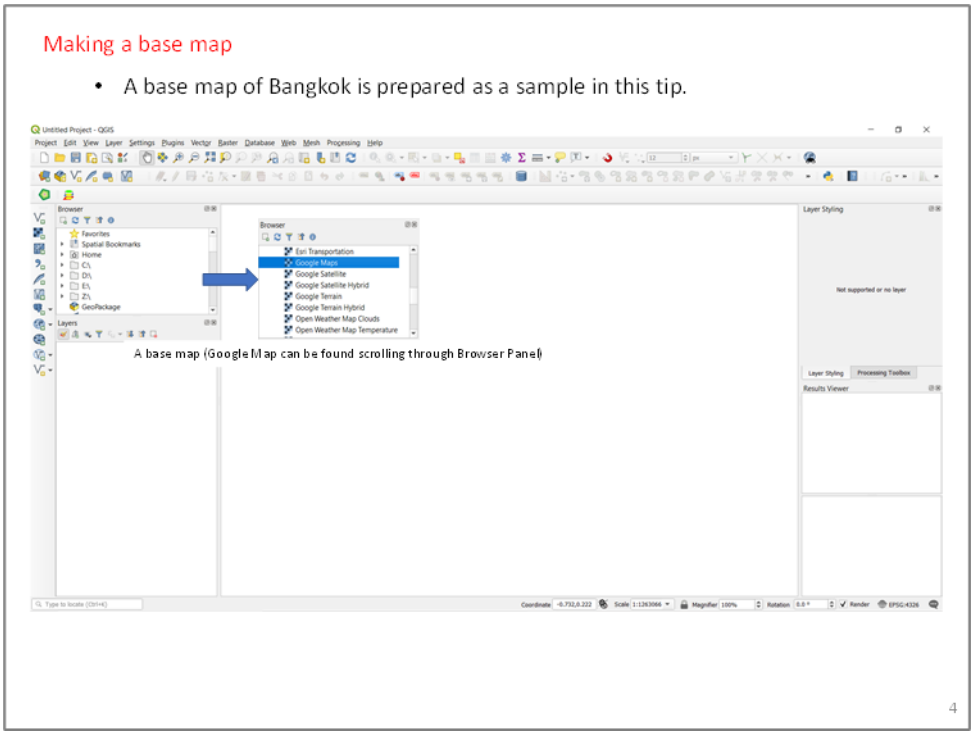


Figure 5-14 Base Map Creation Manual Part 2



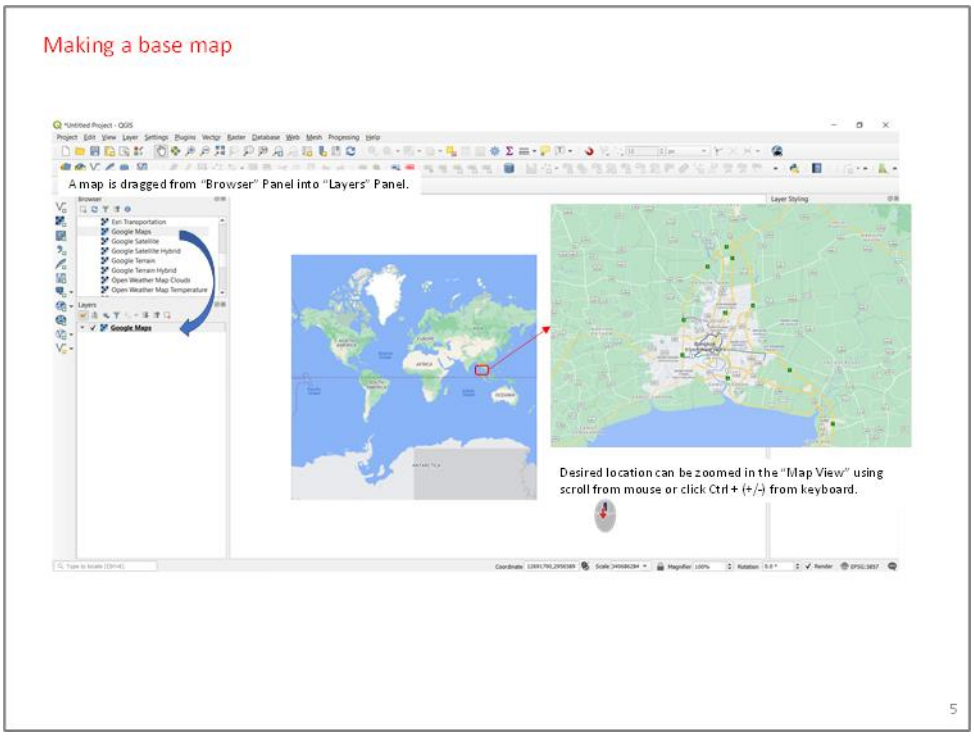
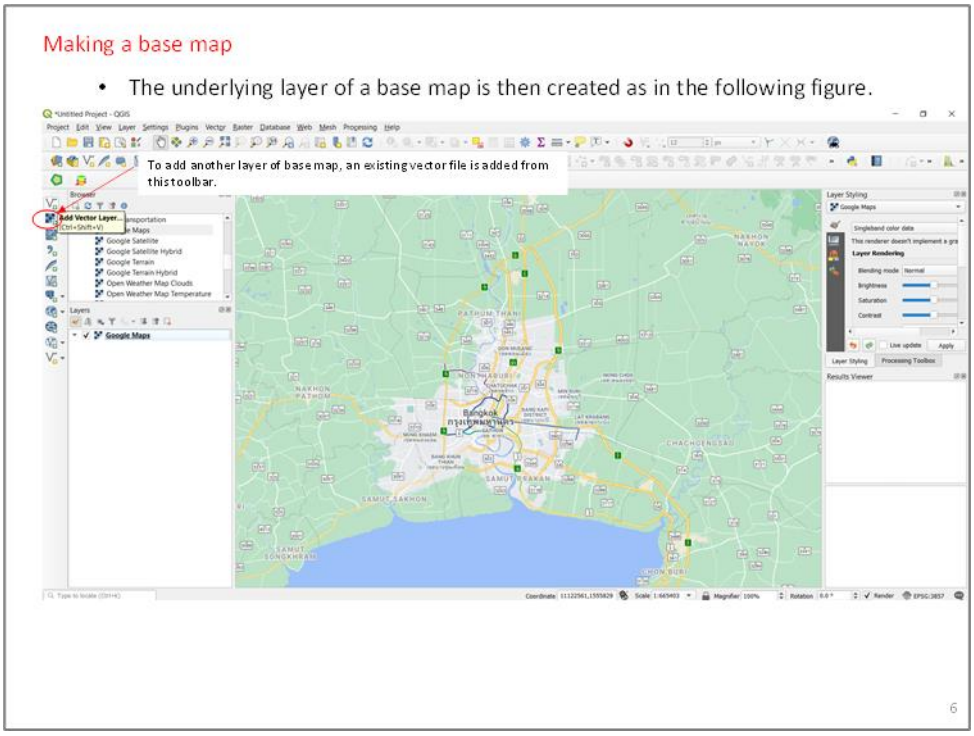


Figure 5-15 Base Map Creation Manual Part 3



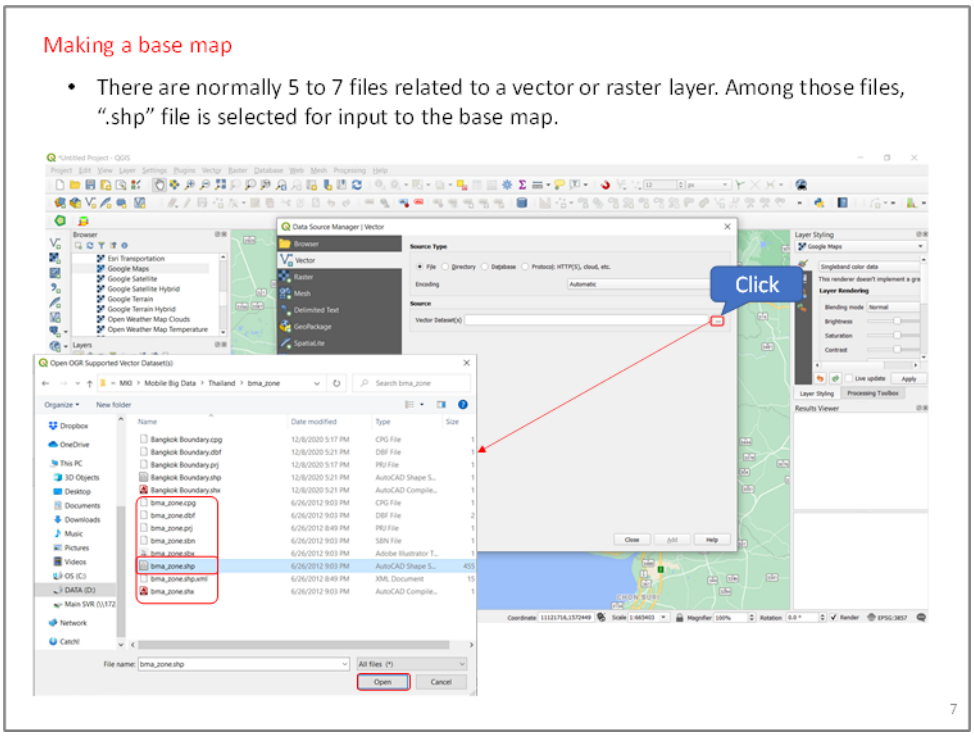
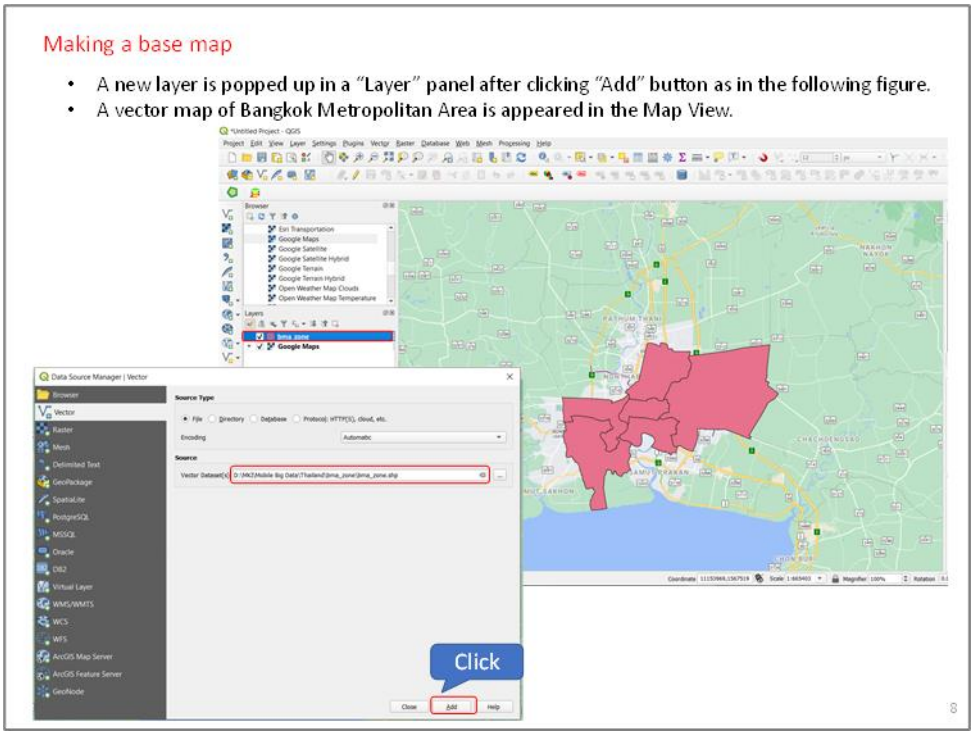


Figure 5-16 Base Map Creation Manual Part 4



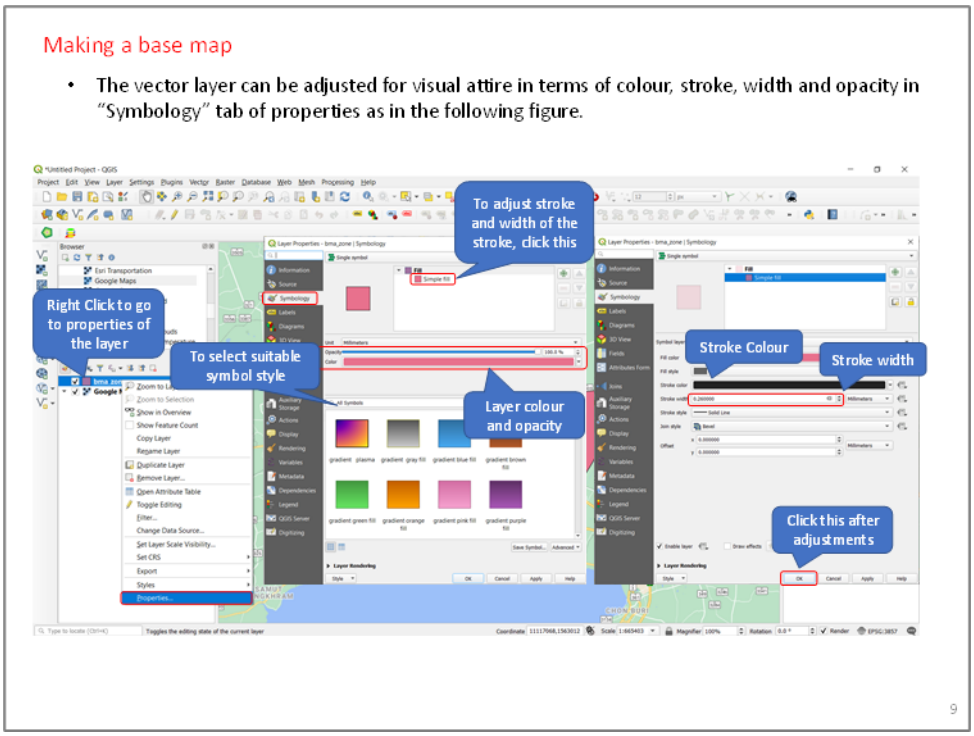
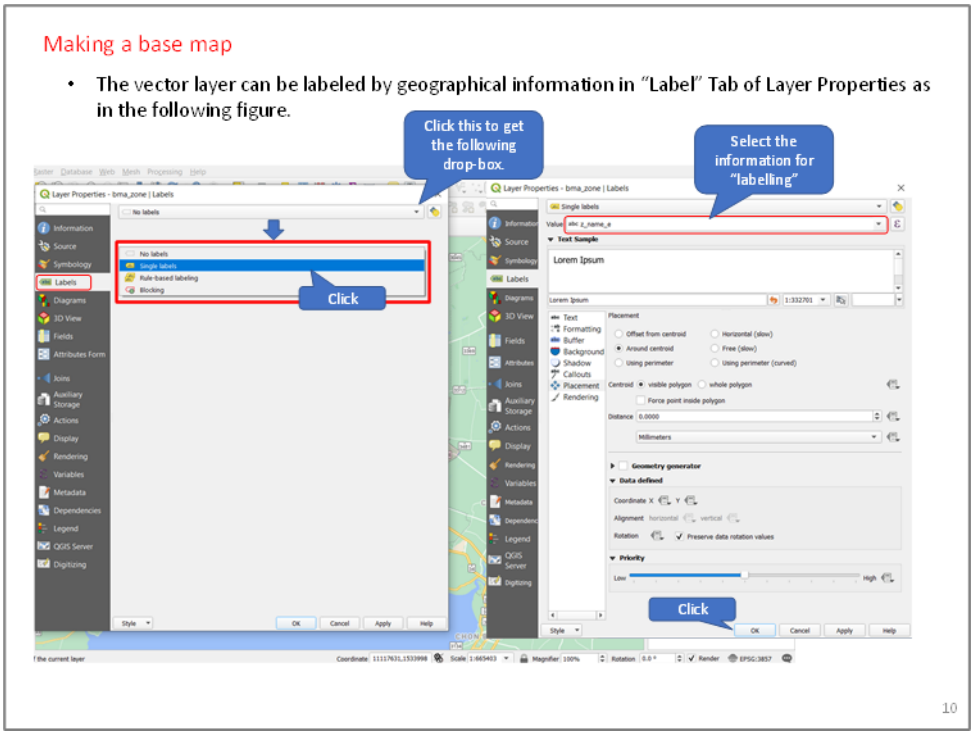


Figure 5-17 Base Map Creation Manual Part 5



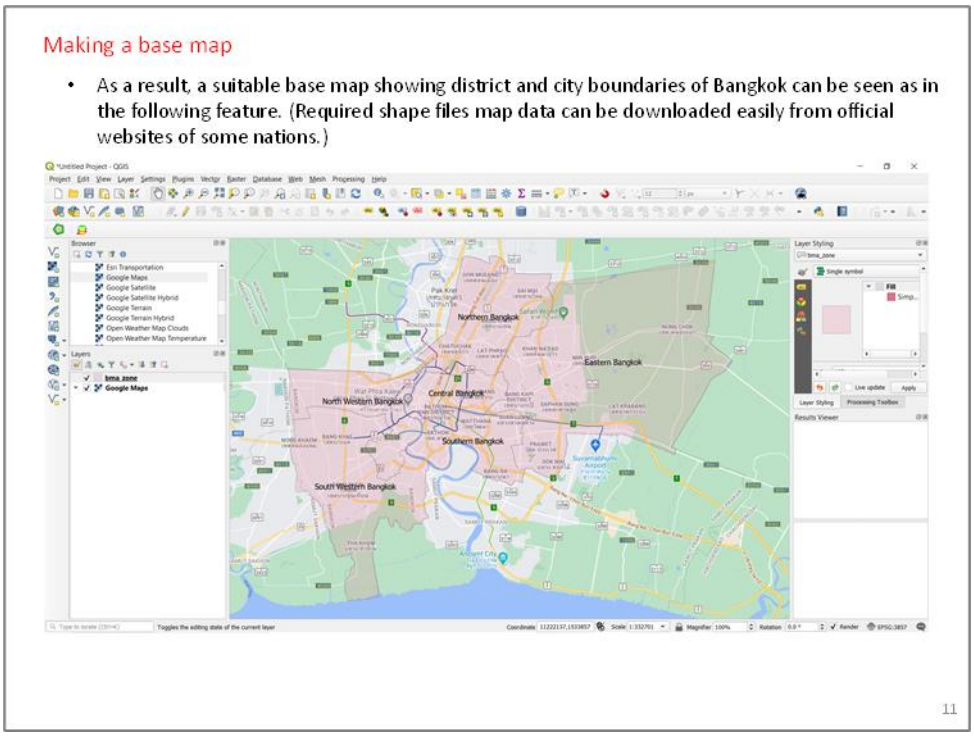
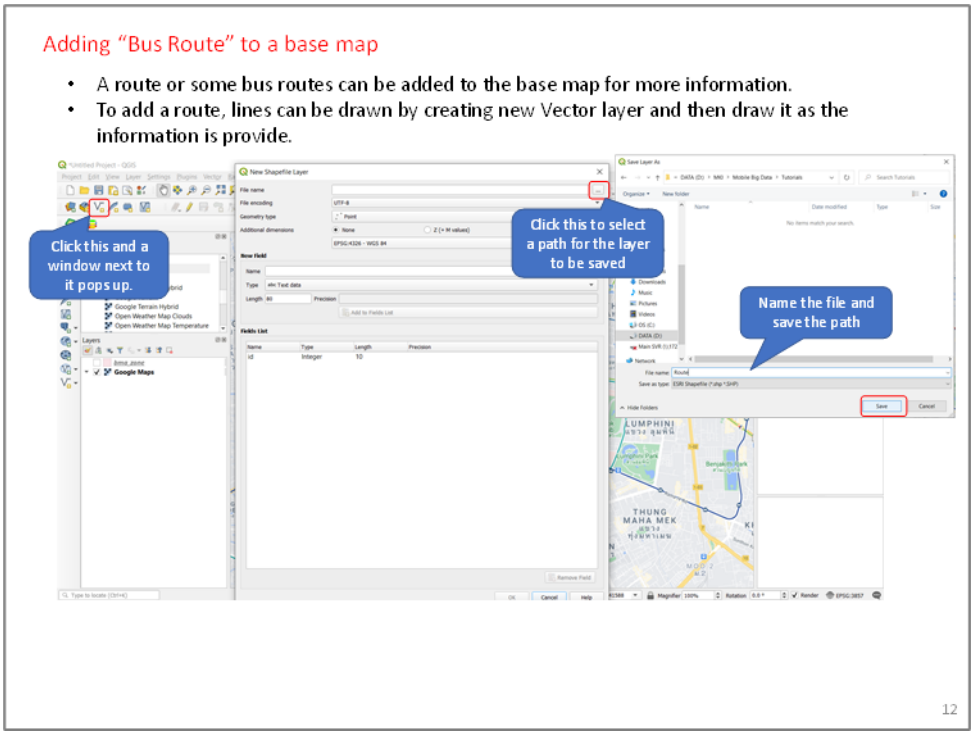


Figure 5-18 Base Map Creation Manual Part 6



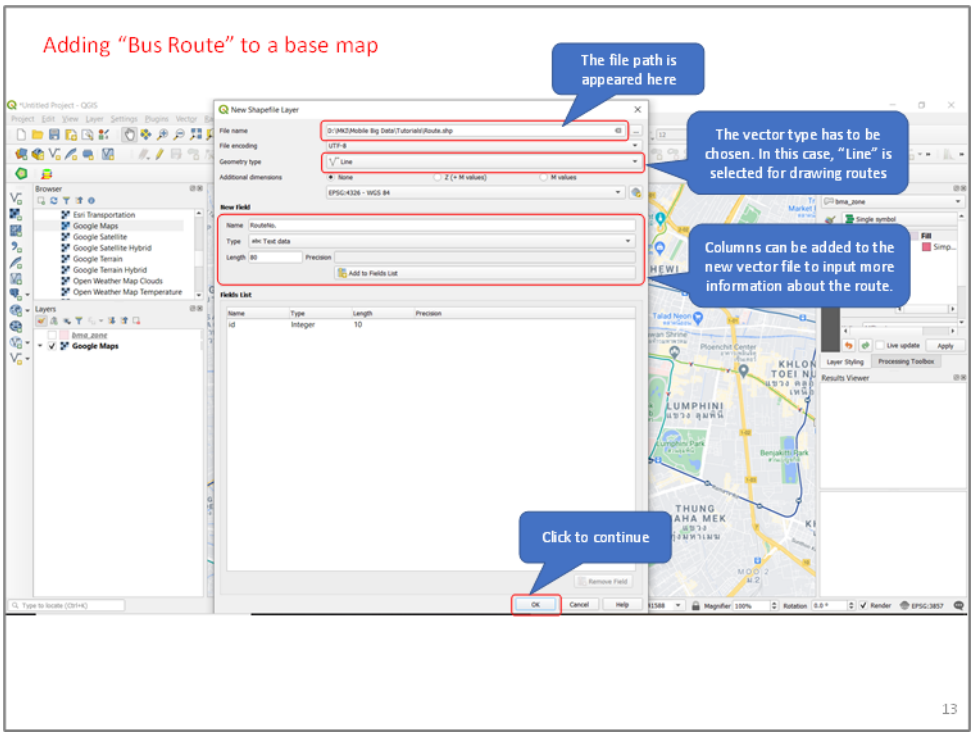
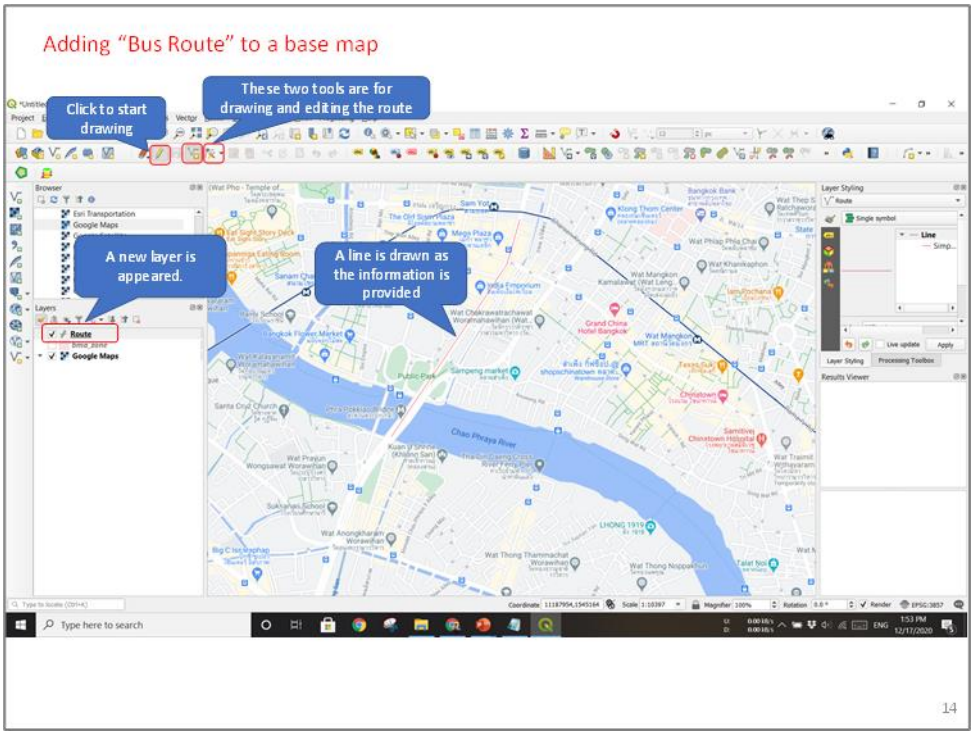


Figure 5-19 Base Map Creation Manual Part 7



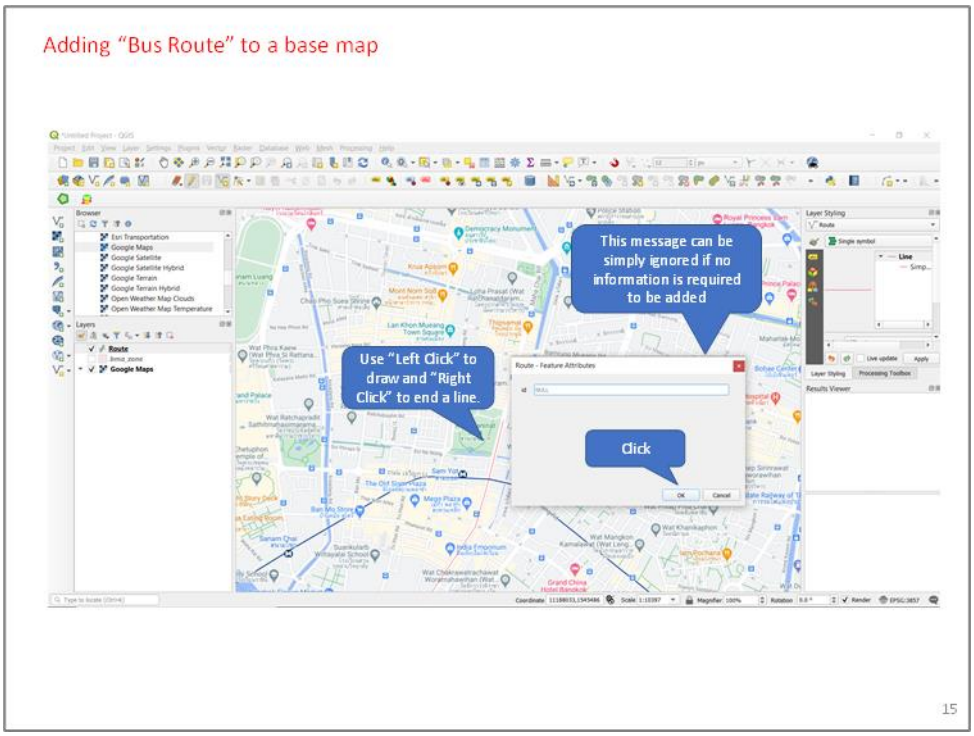
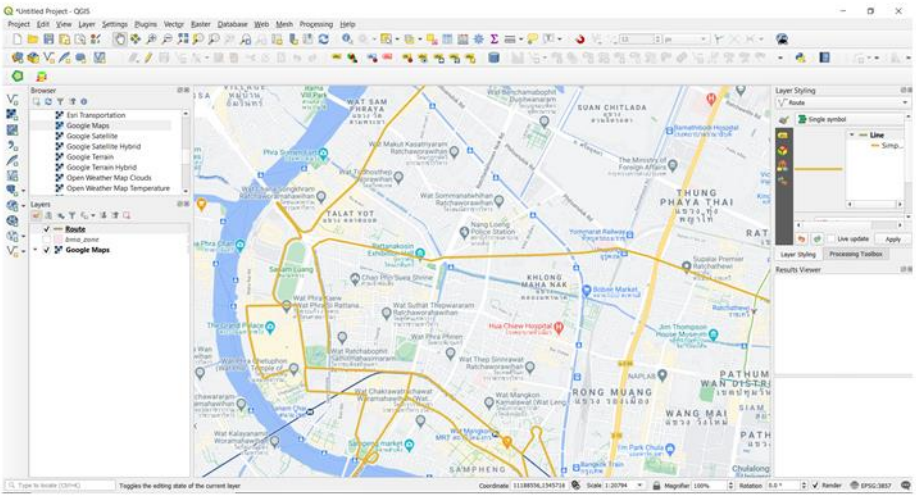


Figure 5-20 Base Map Creation Manual Part 8

Adding "Bus Route" to a base map

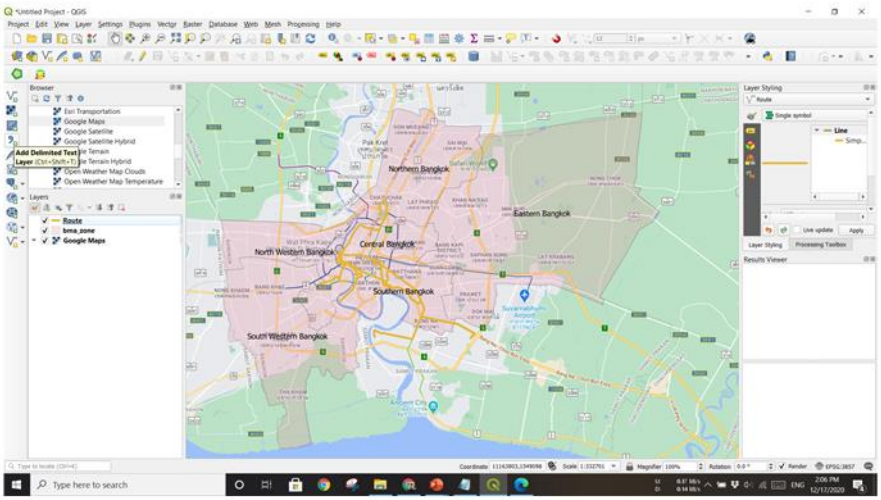
- After making necessary adjustment as in Slide 9, the routes can be seen as in the following sample figure.



16

Finalizing

- A desired base map with some bus routes can be seen after doing previous steps.
  (Bus routes can be added if there is a ready-made vector file provided by the client. If not, required resources are needed to be searched through online or asked from responsible parties.)



17

Figure 5-21 Base Map Creation Manual Part 9

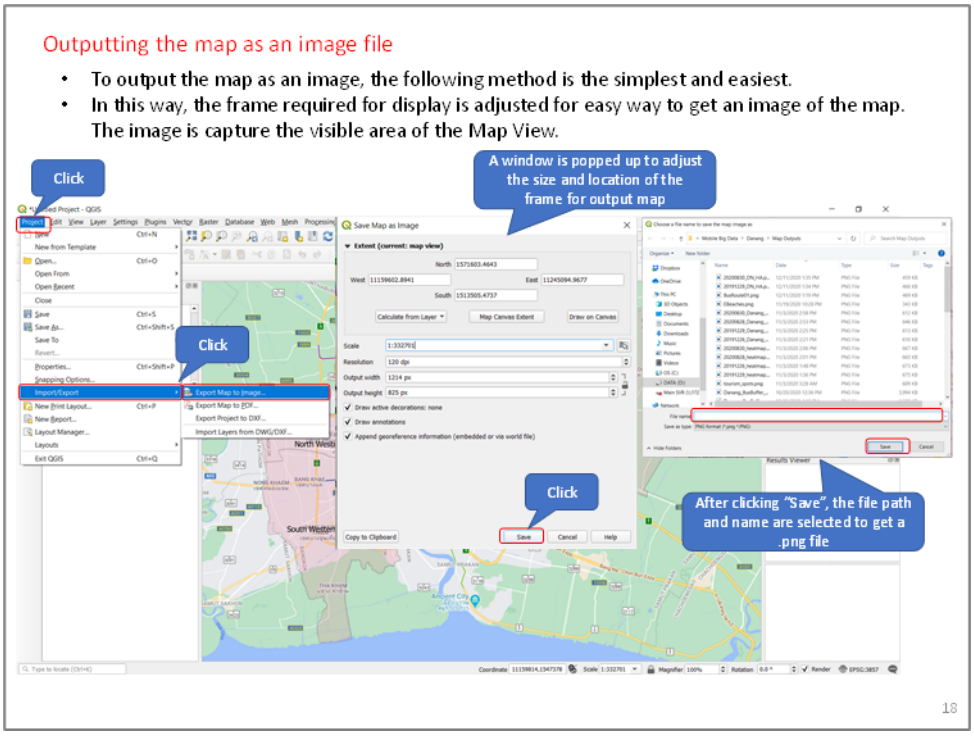


Figure 5-22 Base Map Creation Manual Part 10

3) Location Information Plot

A manual to plot location information using QGIS and create a heatmap was prepared as shown below.

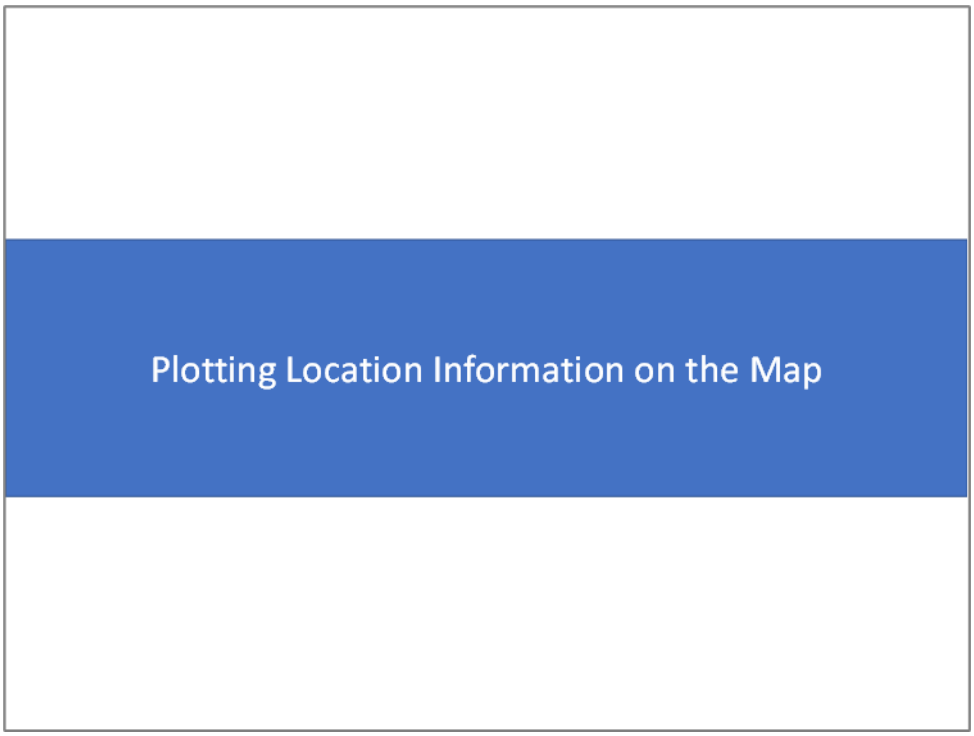
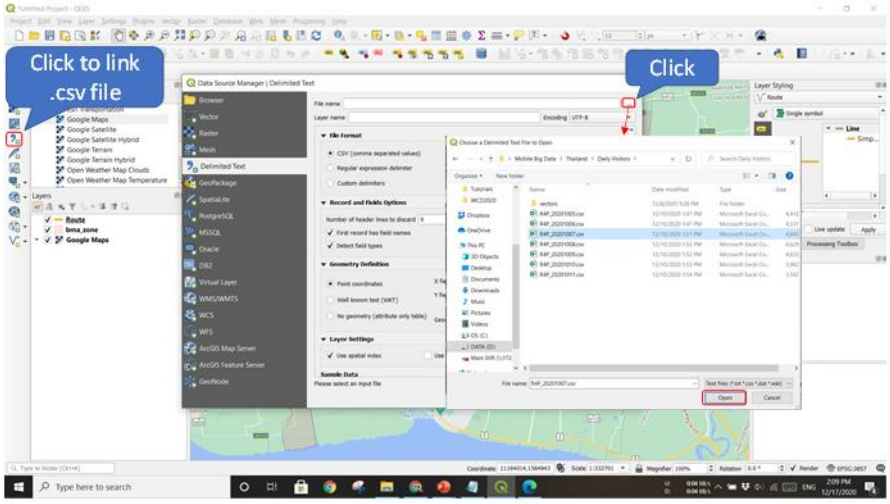


Figure 5-23 Location Information Plot Manual Part 1

Linking .csv file in QGIS (Location data file)

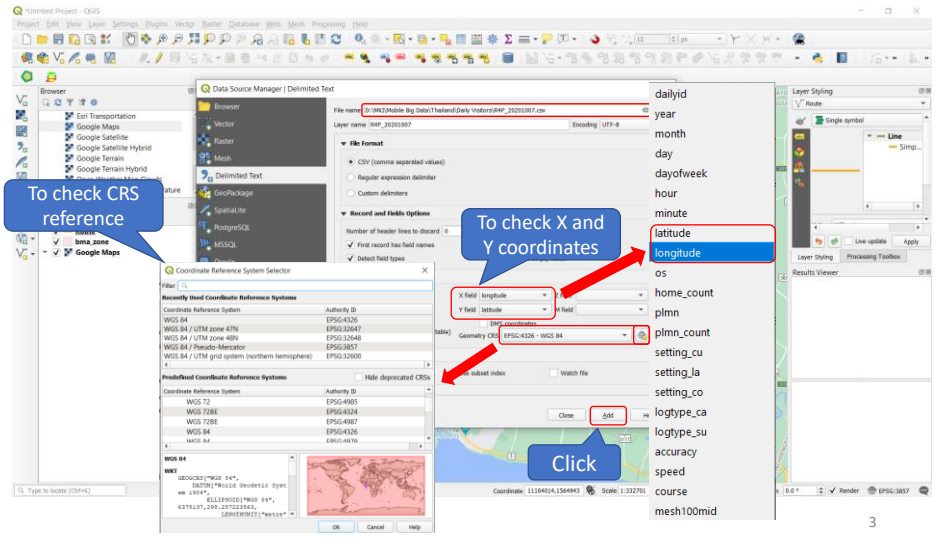
- To plot coordinates on the map, a .csv file is added through "Delimited Text" tool bar and open the file from its original path.



2

Linking .csv file in QGIS (Location data file)

- The data required for linkage are "longitude" and "latitude" which are necessary to check before plotting. (X field = "longitude" , Y field = "latitude")
- The Coordinate Reference System (CRS) should also be checked. The normal CRS system used is WGS 84 with specific region reference line in some cases.

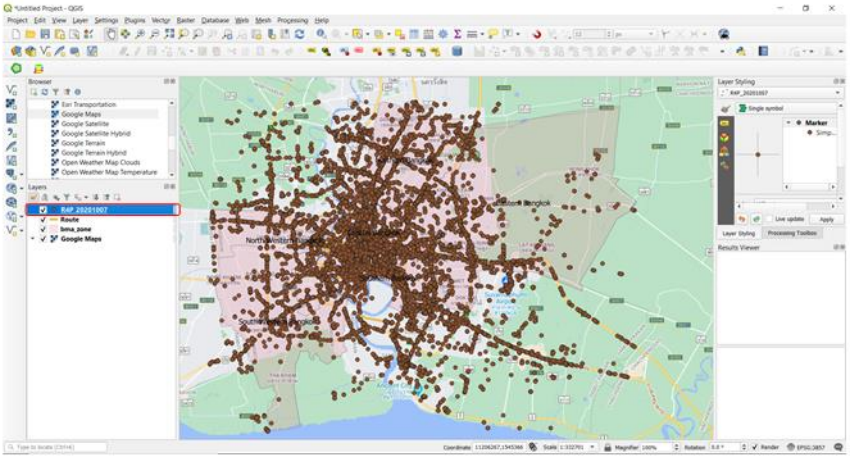


3

Figure 5-24 Location Information Plot Manual Part 2

Plotting location data on the map

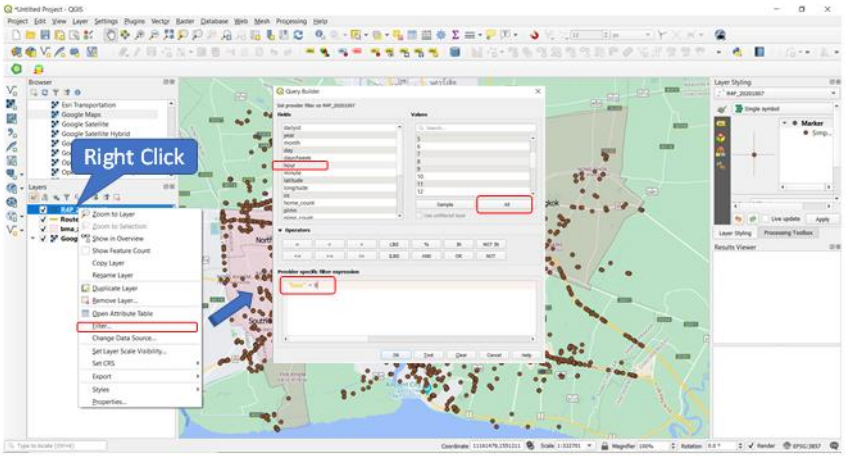
- This .csv file is already clipped out for focused study area (Bangkok Metropolitan Area in this case) and seen as tons of clusters of points around the site.
- In "Layer" panel, a new layer is appeared as in the following figure.



4

Filtering location data for specific time period on the map

- It is better to plot data within specific time period to get exact movements within that hour. In the figure, the movements from 8:00 AM to 8:59 AM are displayed on the map.
- In filtering, the values can be typed manually or they can be chosen as shown in the following figure.

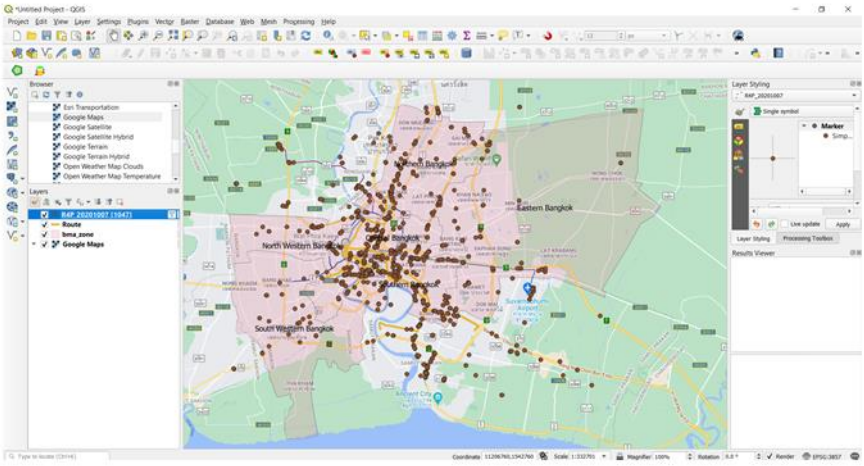


5

Figure 5-25 Location Information Plot Manual Part 3

Filtering location data for specific time period on the map

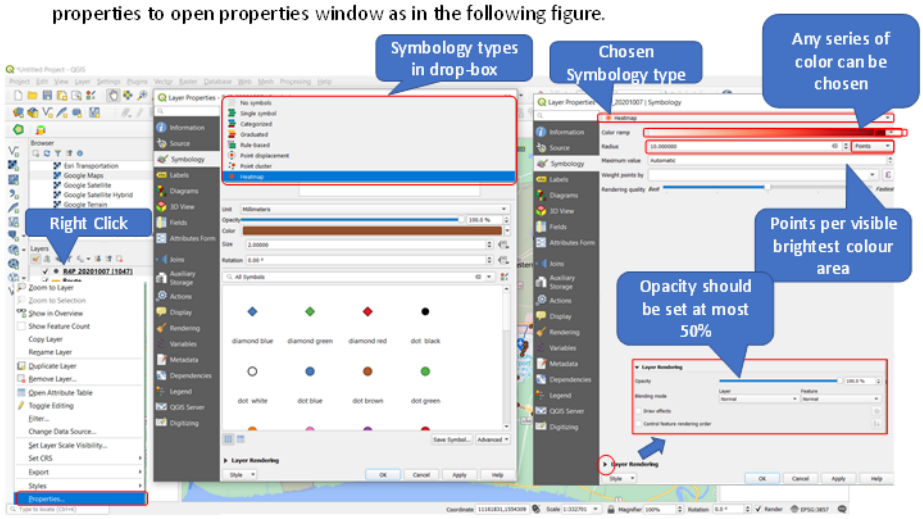
- 24-hour data are filtered into one-hour movements of users and see as some clusters of points as seen in the following figure.



6

Making a heat map based on plots of location data

- As usual, layer properties can be called up by "right clicking" the layer and then clicking the properties to open properties window as in the following figure.

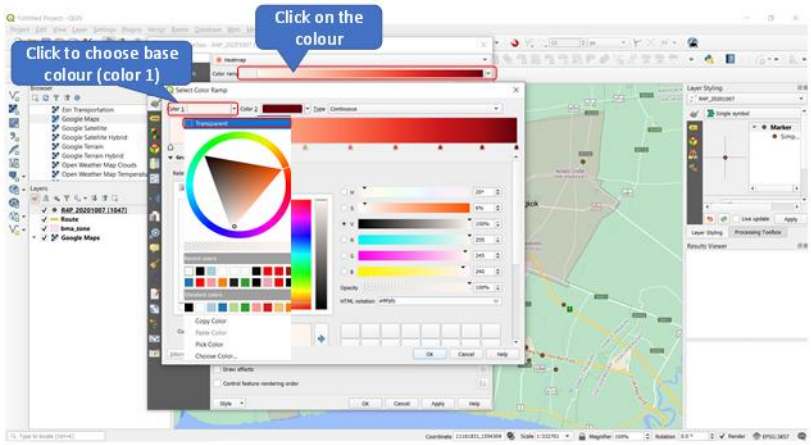


7

Figure 5-26 Location Information Plot Manual Part 4

Making a heat map based on plots of location data

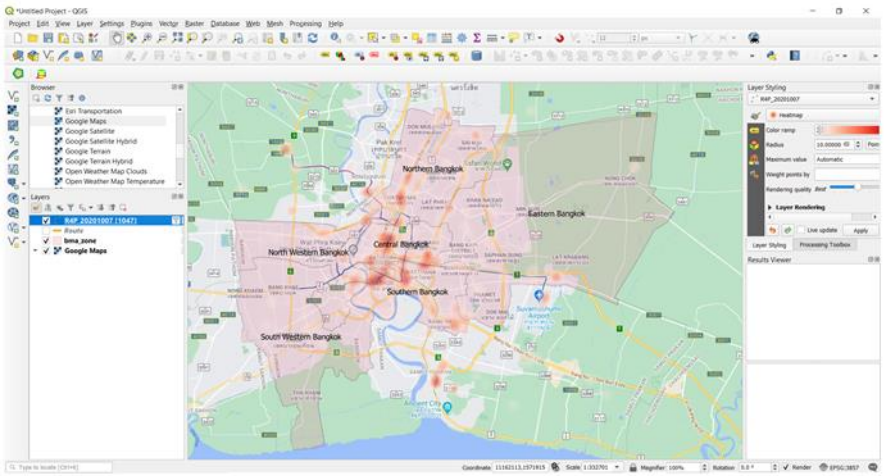
- The basic colour should be transparent not to cover the base map.



8

Finalization of plotting and display in a heat map

- Clusters of complex coordinate points can be seen as a heat map where most movements are crowded at specific time period as in the following figure.



9

Figure 5-27 Location Information Plot Manual Part 5

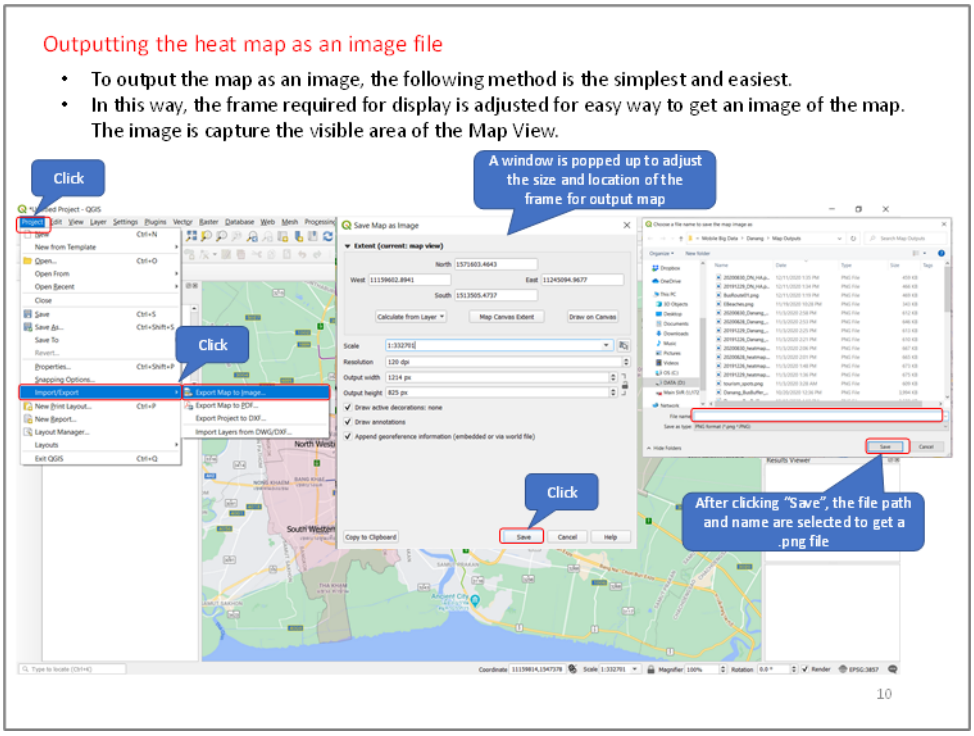


Figure 5-28 Location Information Plot Manual Part 6

4) Location Information Analysis

A manual for analysis of location information focusing on bus route was prepared as shown below.

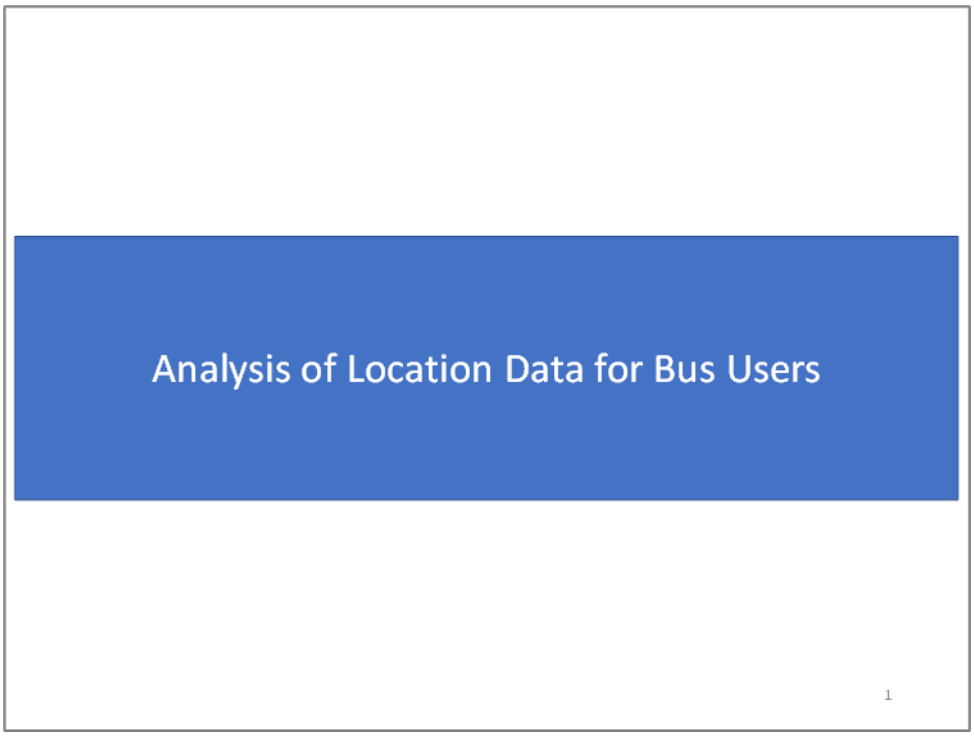
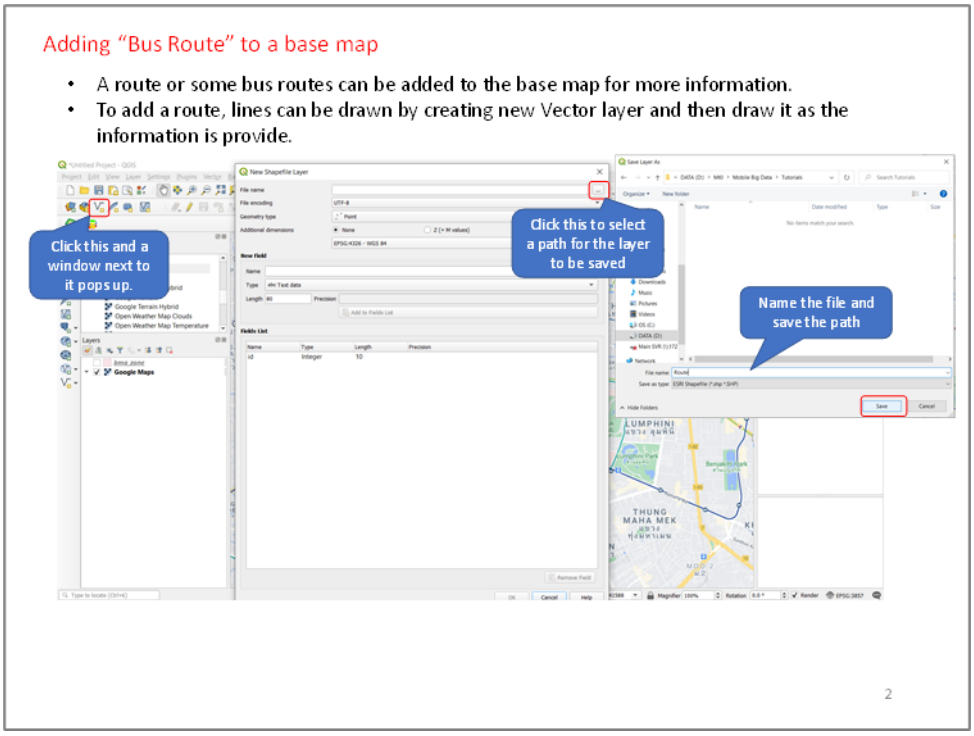


Figure 5-29 Location Information Analysis Manual Part 1



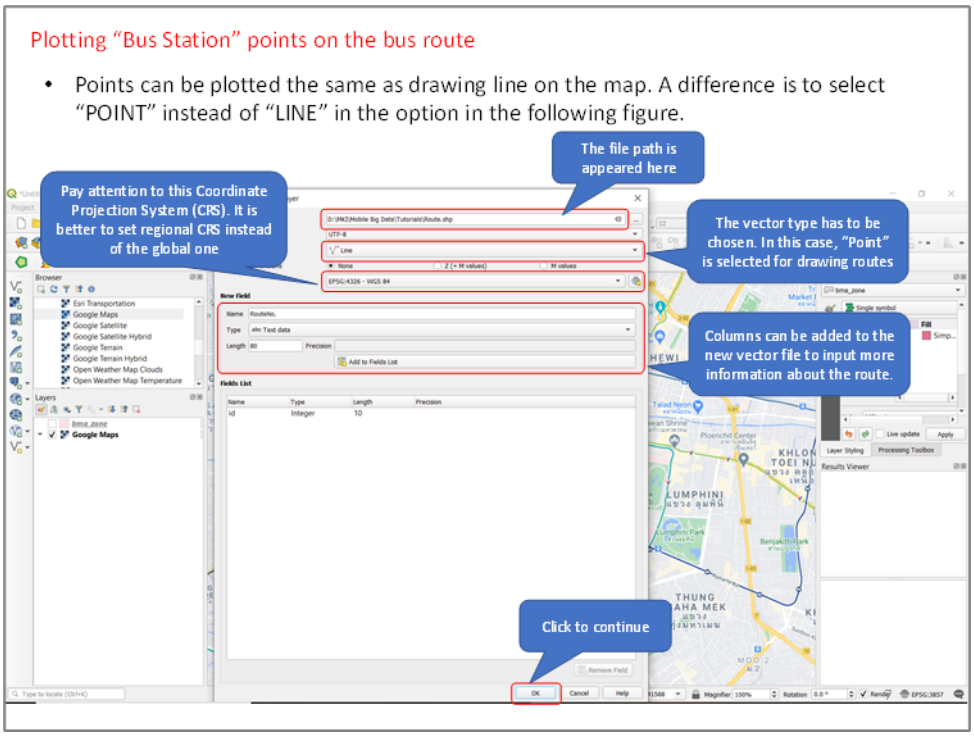
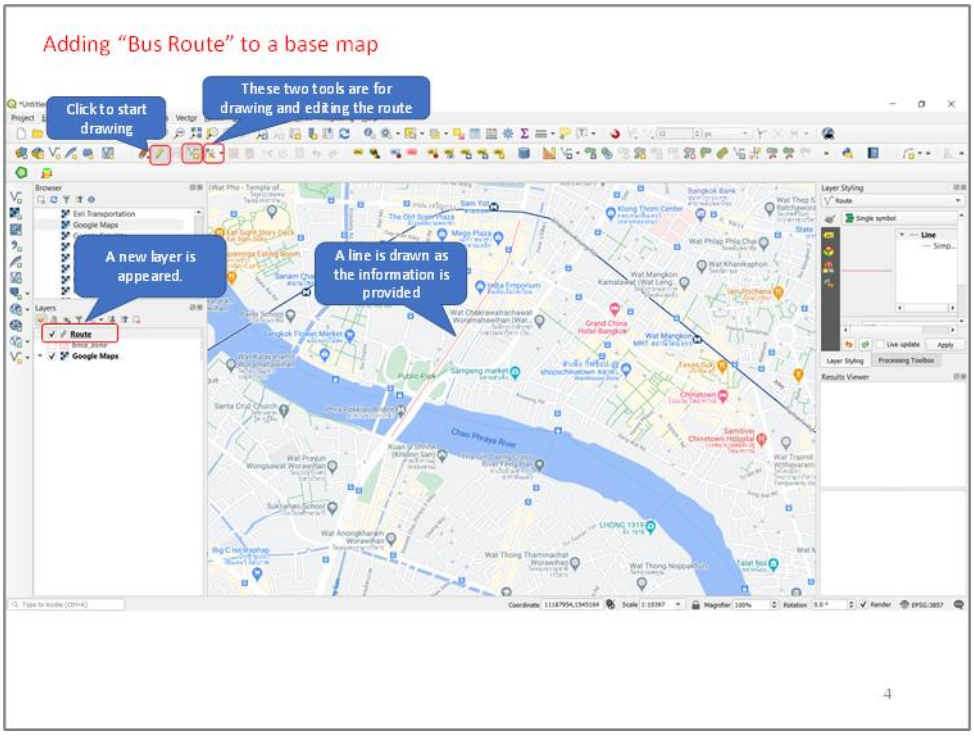


Figure 5-30 Location Information Analysis Manual Part 2



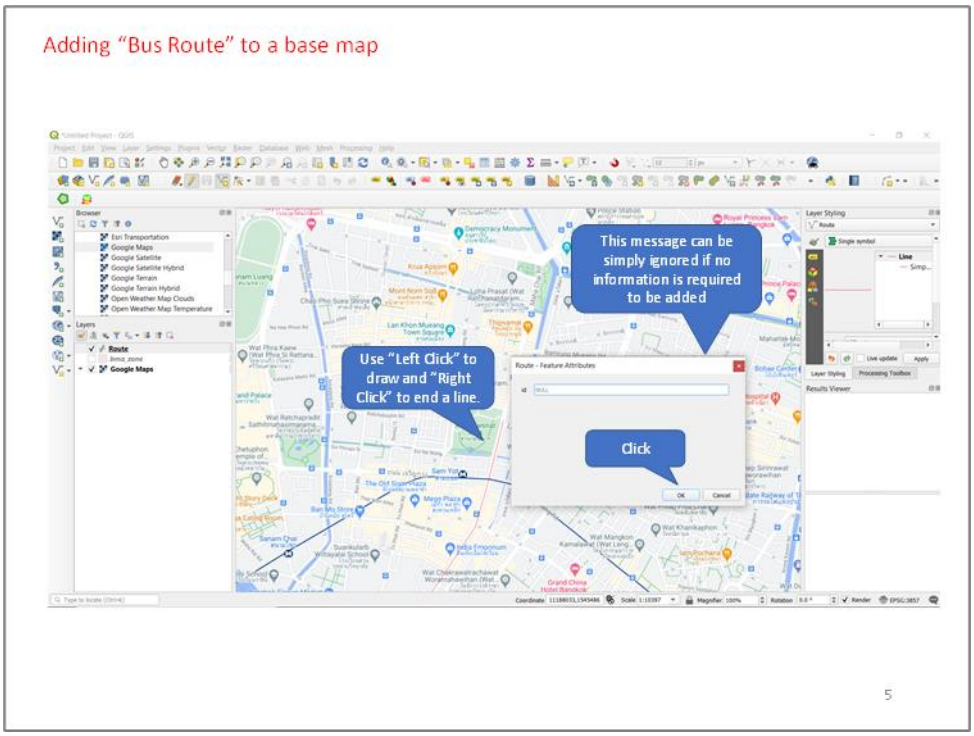
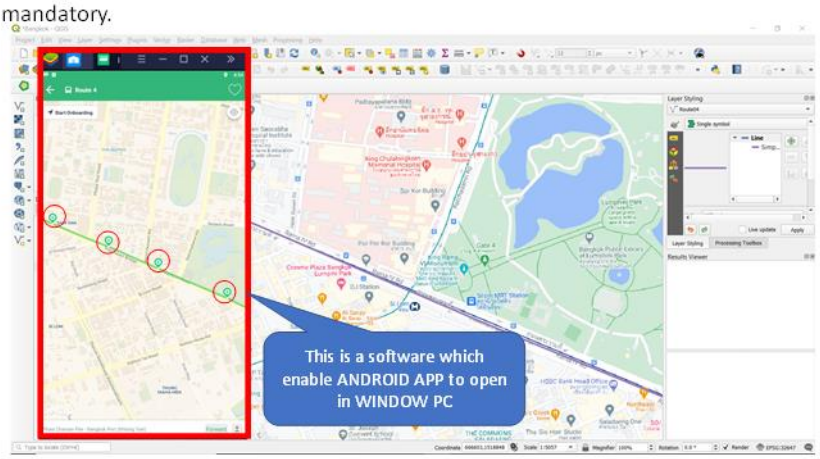


Figure 5-31 Location Information Analysis Manual Part 3

Plotting “Bus Station” points on the bus route

- To check the vicinity of App users conditions, the locations of existing bus stations are required.
- Any Bus App for the required city is available for necessary route and bus stop data and the bus stops are plotted as in the map in the APP.

*The APP can be opened by any mobile phone. The software mentioned in the figure is not mandatory.



Plotting “Bus Station” points on the bus route

- Points can be plotted the same as drawing line on the map. A difference is to select “POINT” instead of “LINE” in the option in the following figure.

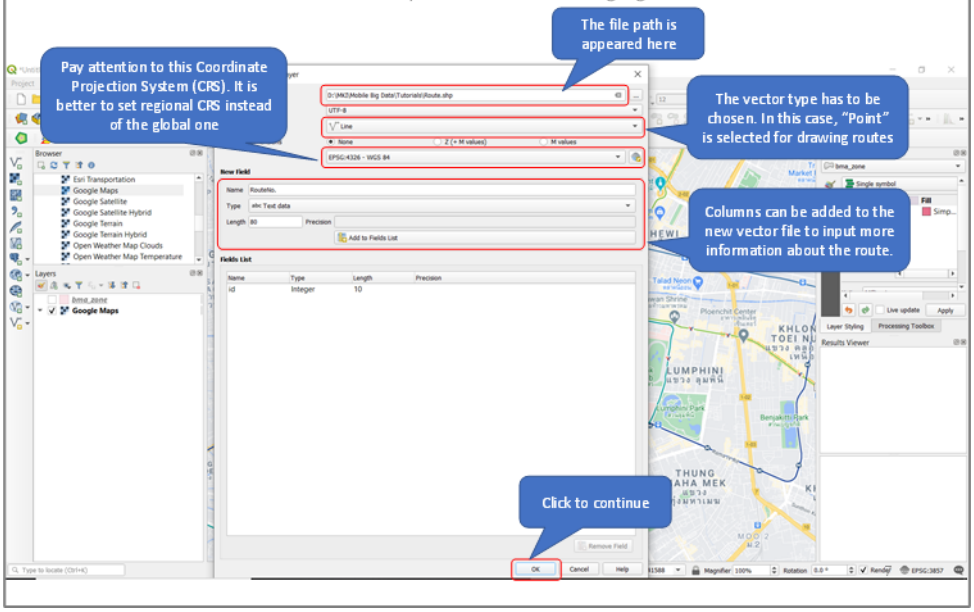
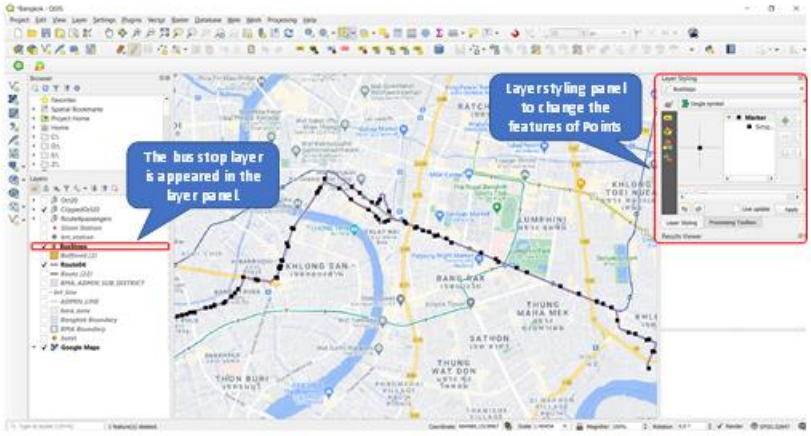


Figure 5-32 Location Information Analysis Manual Part 4

Plotting "Bus Station" points on the bus route

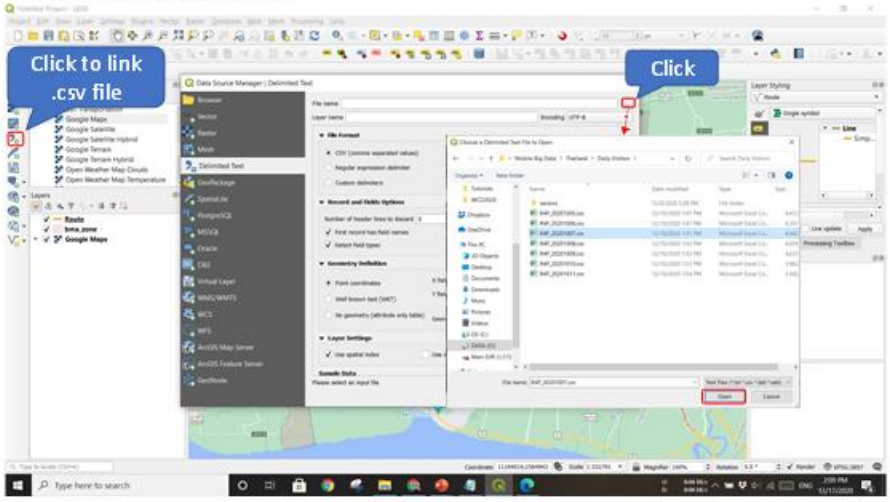
- After plotting according to the location information, the points can be seen as in the Figure. The feature of the points can be edited in "Layer Styling" Panel or in Properties of the layer.
- The following figure shows bus station points for a specific route.



8

Plotting Location Data by Linking .csv file in QGIS

- To plot coordinates on the map, a .csv file is added through "Delimited Text" tool bar and open the file from its original path.

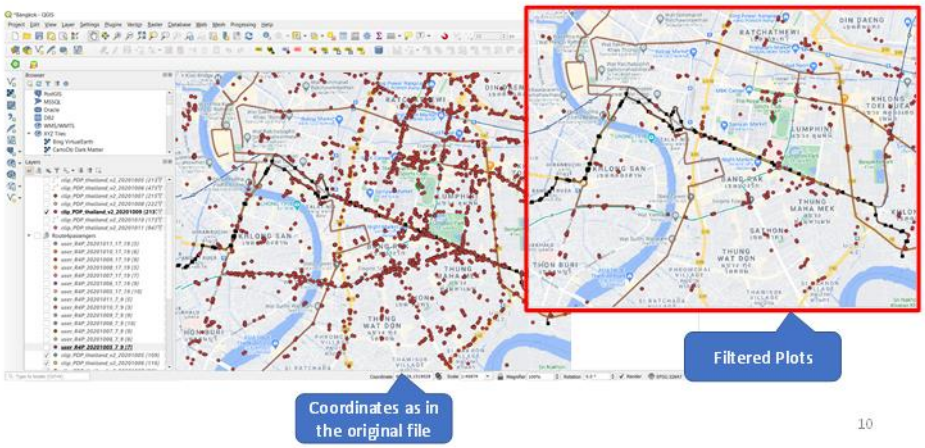


9

Figure 5-33 Location Information Analysis Manual Part 5

Plotting Location Data by Linking .csv file in QGIS

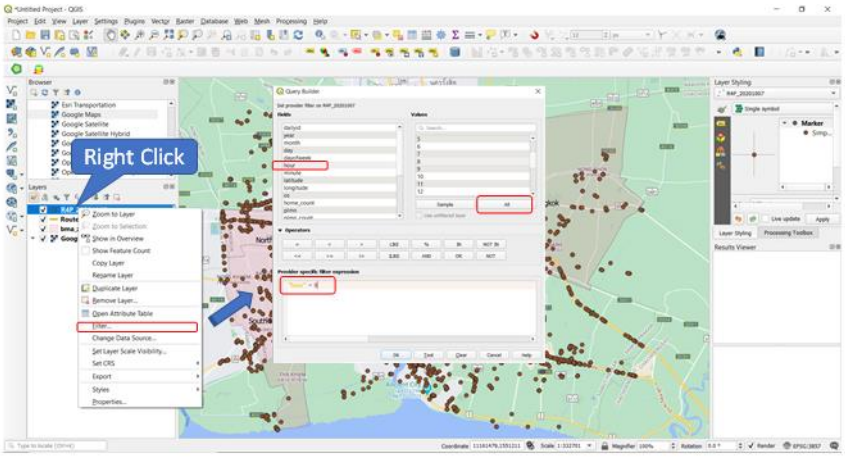
- A map can be seen as in the following figure filled with coordinate points spreading all over the area of analysis. They can be collectively viewed as a heat map so that clusters of crowds can be known.
- Before making heat maps, the plots can be analyzed within specific time frame and filtered as in the red box. In this figure, the plots are filtered for the time of from 7:00 AM to 8:59 AM as morning peak.



10

Filtering Location data for specific time period on the map

- In filtering, the values can be typed manually or they can be chosen as shown in the following figure.



11

Figure 5-34 Location Information Analysis Manual Part 6

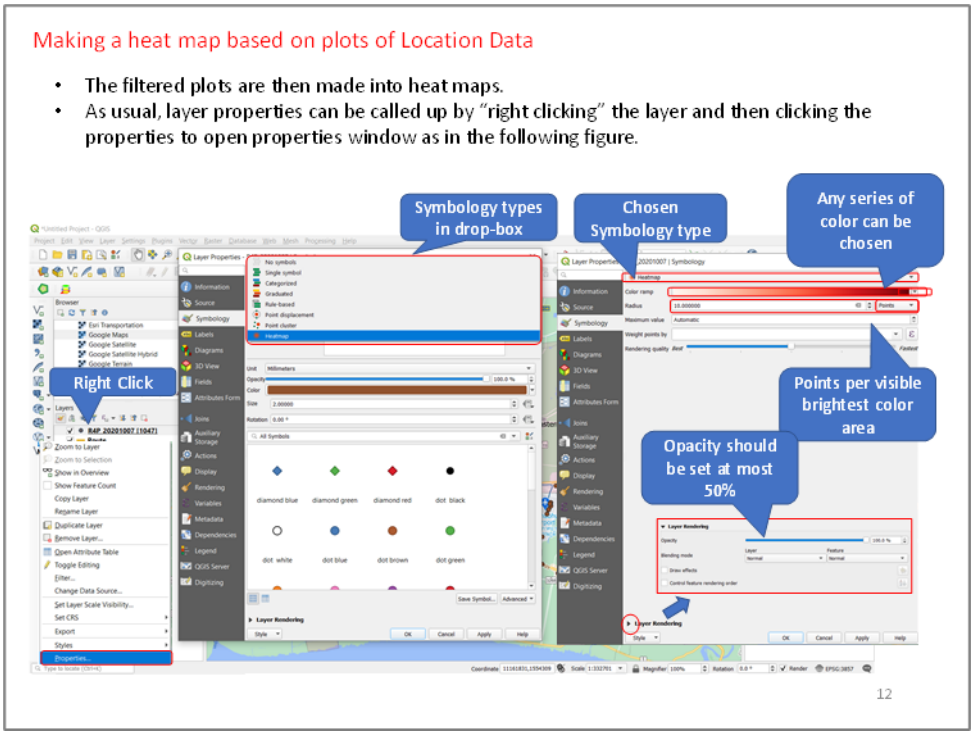
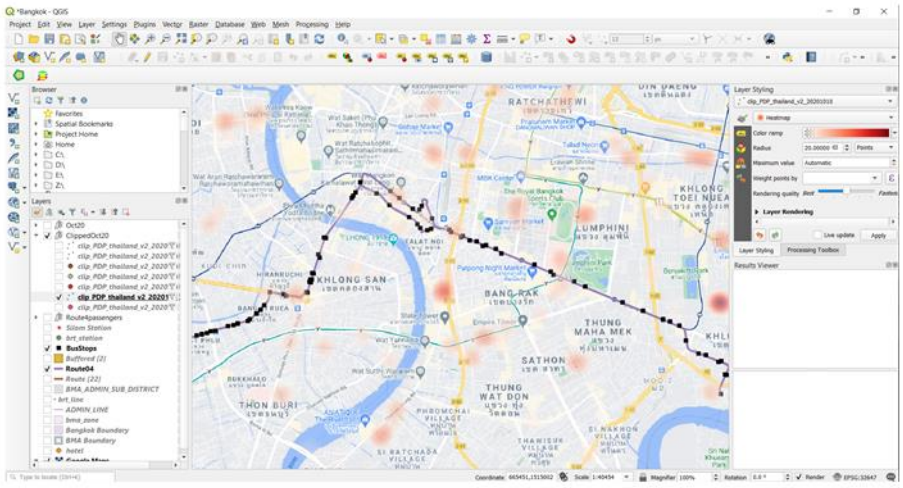


Figure 5-35 Location Information Analysis Manual Part 7

Heat map analysis with bus information

- The crowded heat map can be checked around the vicinity of bus stops and bus routes as in the following figure.



Extracting Specific Bus Route Users

- To filter out bus users from the map, it is better to pick coordinates from a specific bus route.
- Before picking, the bus route should be buffered (widened) to the width of the actual road. It can be estimated that most people on the road might use buses. The bus route is buffered as in the following figure.

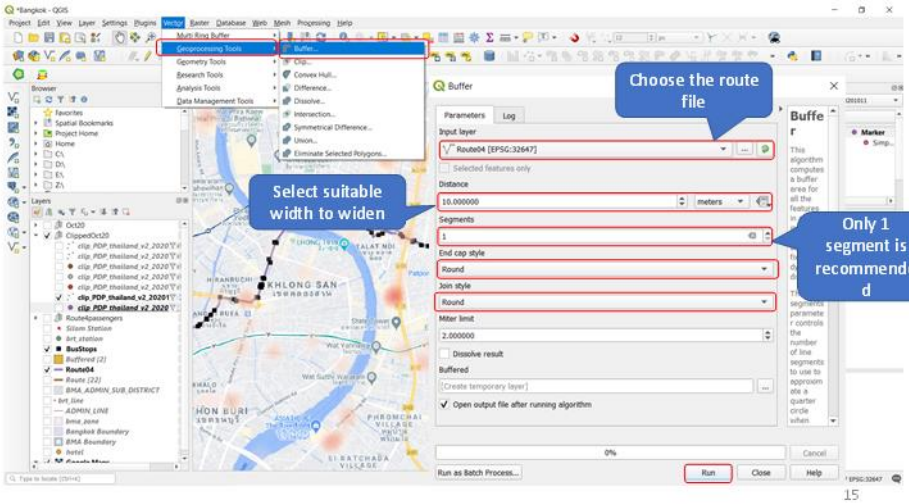
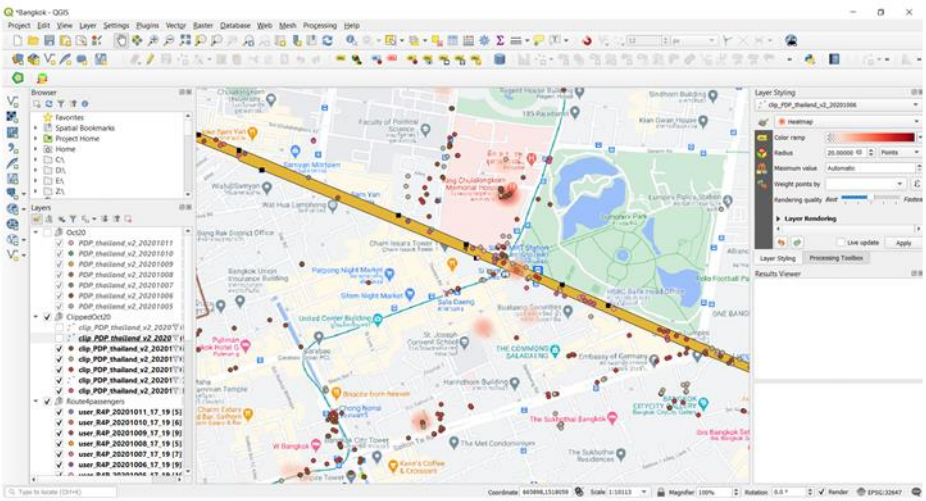


Figure 5-36 Location Information Analysis Manual Part 8

Seeing the App Users Plots on the Map with respect to the Bus Route

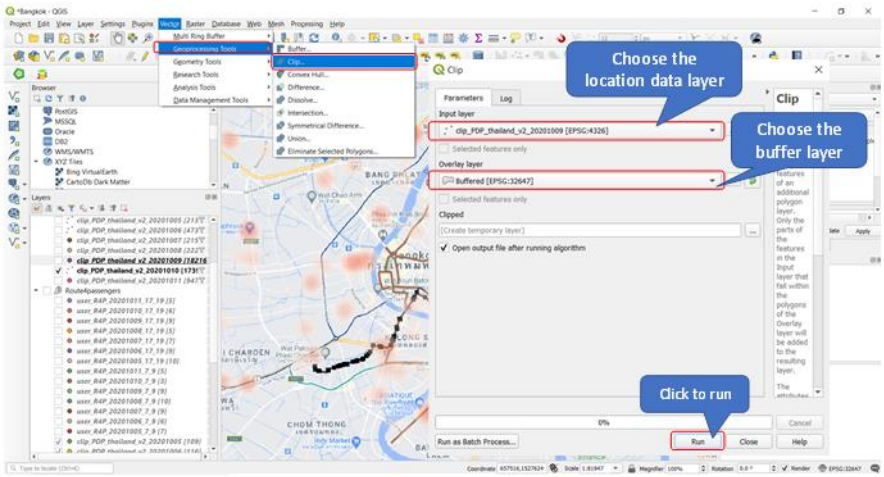
- The bus route can be seen a buffered route in the following figure.
- The next thing is to filter out the points on the bus route.



16

Extracting App users for the bus route

- The data for the bus route can be extracted by clipping out the only coordinate points on the bus route buffer path.
- The data can be clipped out as in the following figure.

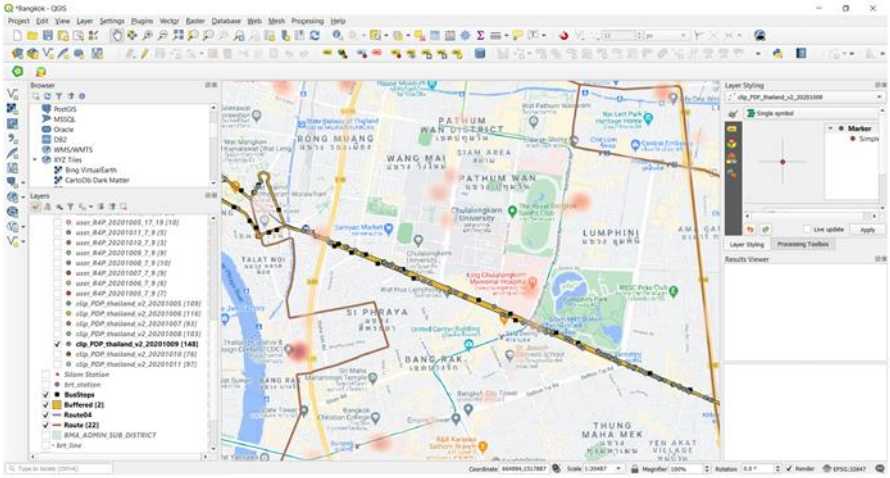


17

Figure 5-37 Location Information Analysis Manual Part 9

Extracting App users for the bus route

- Potential bus users can be seen as coordinate points on the specific bus route as in the following figure.
- The data can be filtered out for duplicated data or time specific data to get unique number of bus users in a specific time frame.



Extracting App users for the bus route

- The unique data can be seen as point data on the bus route.
- The database of the points can indicate the basic information of those points.

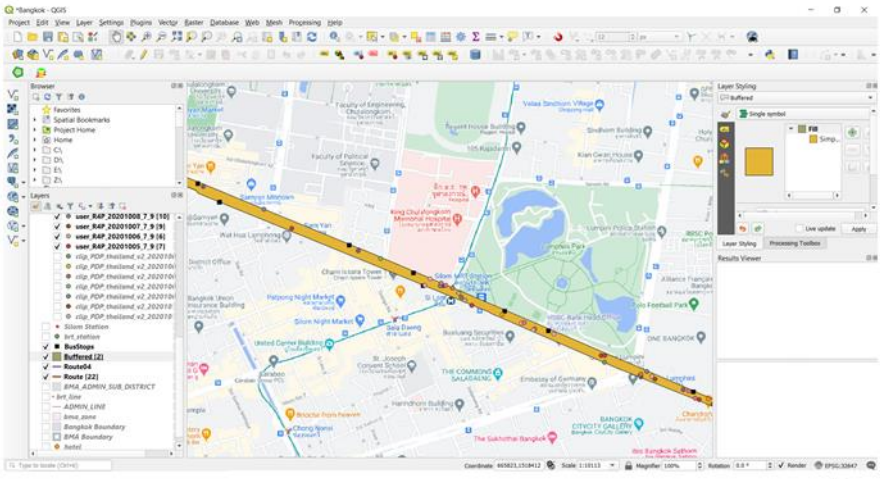
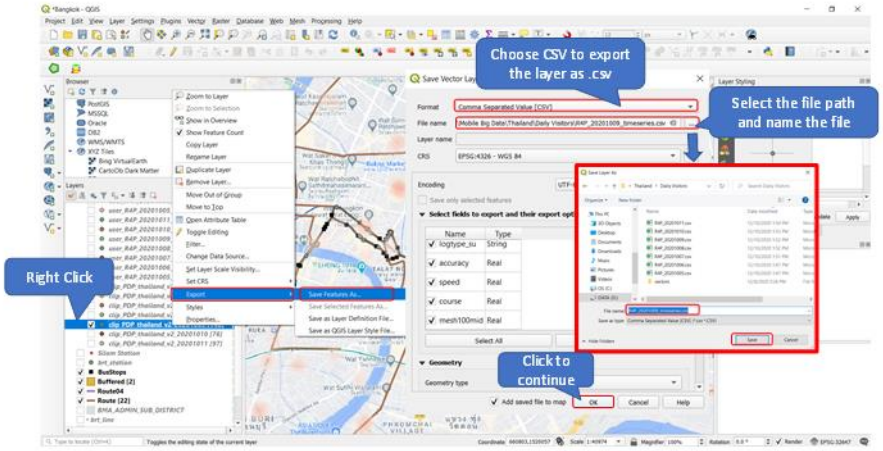


Figure 5-38 Location Information Analysis Manual Part 10

Extracting App users for the bus route by time-frame

- It is difficult to get unique users by specific time frame since the coordinates are moving as vehicles move.
- However, the data can be seen which time period is the most crowded from analysing the data through Microsoft Excel.
- Before that, the .csv file of clipped out bus user data can be extracted as follows.



Extracting App users for the bus route by time-frame

- Extracted CSV file is opened and the data can be analyzed for time series graph.
- As in the following figure, the extracted data can be seen as a CSV data and arranged by hour. The graph data can be made by Pivoted Chart function in Excel.
- Since it is difficult to get unique data by time, the following graph can represent the hourly movements.

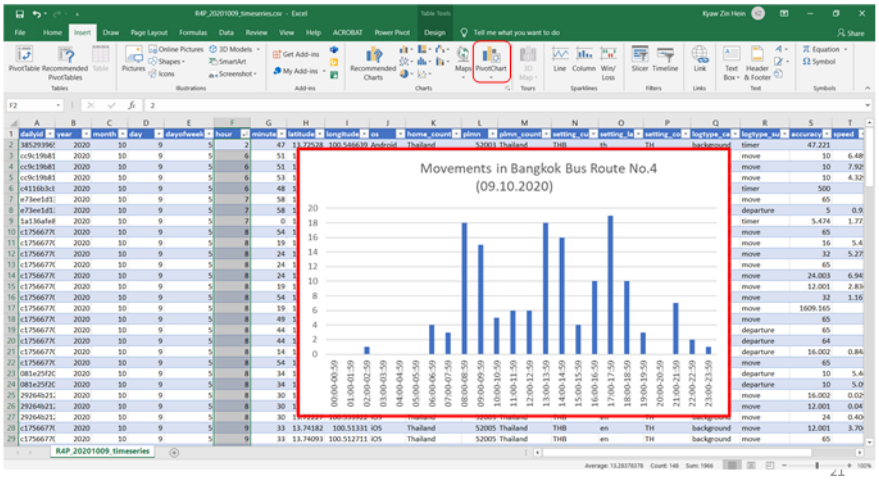


Figure 5-39 Location Information Analysis Manual Part 11

5.3.2 2nd Technical Assistance

(1) Contents of Technical Assistance

1) Reconfirming Location Information of Namtang App

(i) Level Data

Level data was confirmed in the location information attribute of the Namtang app.

Level 1 is a user who closed the application immediately after the route search. No data is recorded other than the latitude / longitude information and the searched time. Most users are level 1.

Level 2 is a user who has confirmed detailed information after route search, and required time, distance, and fare, which are the search results, are recorded.

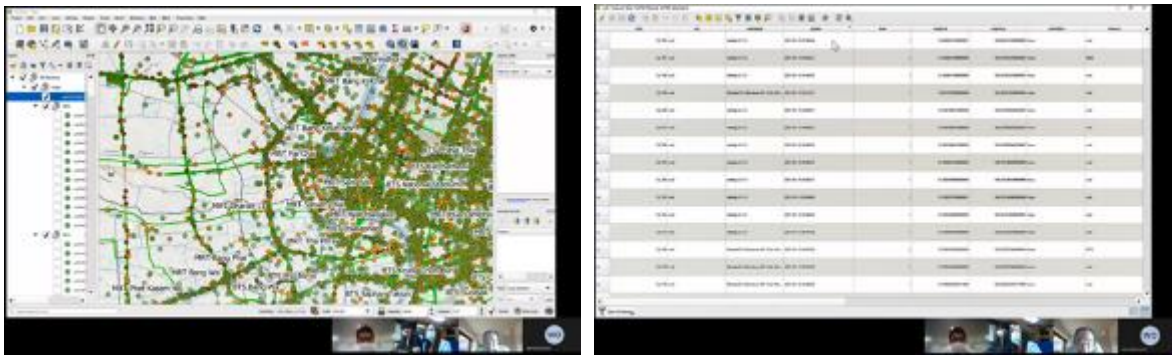


Figure 5-40 Search History Information Plot (Left Figure) and Attribute Data (Right Figure)

(ii) Mode Data

The mode data in the attribute data was confirmed.

Namtang app has the function to search for routes using specific transportation. Mode data is transportation data which is set when the route is searched. Therefore, it is not possible to know transportation used from the currently acquired data.

(iii) Amount of Search History Data

The amount of search history data was confirmed.

64,874 data in 2020 and 67,876 data in 2019 was obtained. There is variation in the amount of data, i.e. 6,300 in January 2022 and 1,136 in April 2020 with a decrease of more than 80%. Bangkok was locked down in April due to COVID-19. So it is thought that the result are reflected. The amount of data was less than 200 per day. This was a small amount to consider demand for each bus route by time zone.

2) Analysis of Feeder Bus

Figure 5-41 shows the results of plotting the origin destination data around the new MRT station (Fai Chai station). Although it is data for two years, there were few Namtang users whose origin and destination were around Fai Chai station. It is thought that the reason is that few people use both MRT and bus to get to their destination in Bangkok, and few people search the route by Namtang because the area around the new station is a residential area.

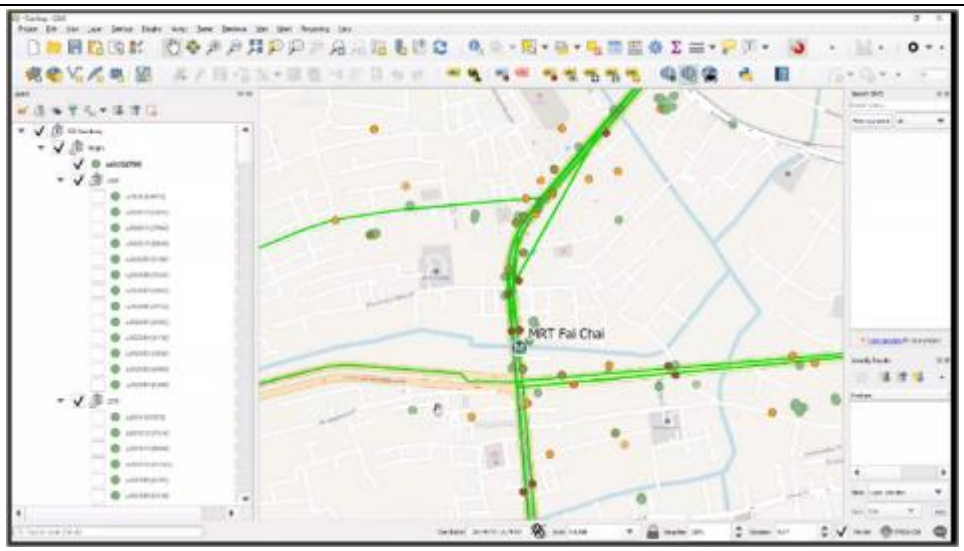


Figure 5-41 Origin Destination Data around the New MRT Station

3) OD Analysis

Since the amount of origin destination data around the Fai Chai station shown above was small, a heat map was created in central Bangkok as shown in Figure 5-42. Because the data concentrated at BTS Siam station, a 500 m buffer was created and the data was extracted as shown in Figure 5-43. OD analysis of users' origin and destination at BTS Siam station was carried out as shown in Figure 5-44. It was confirmed that they are visiting from various places because it is in the center of Bangkok.

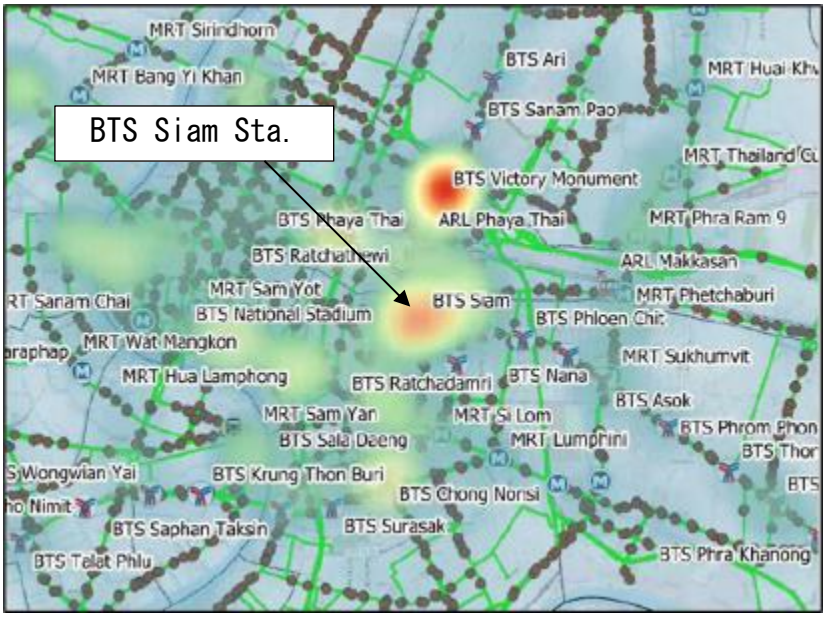


Figure 5-42 Heatmap in Central Bangkok

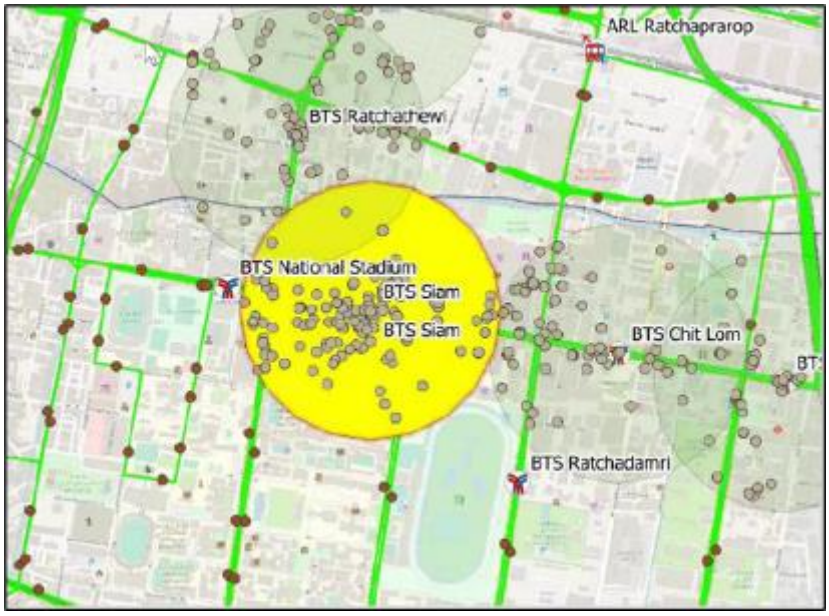


Figure 5-43 Buffer of BTS Siam Station

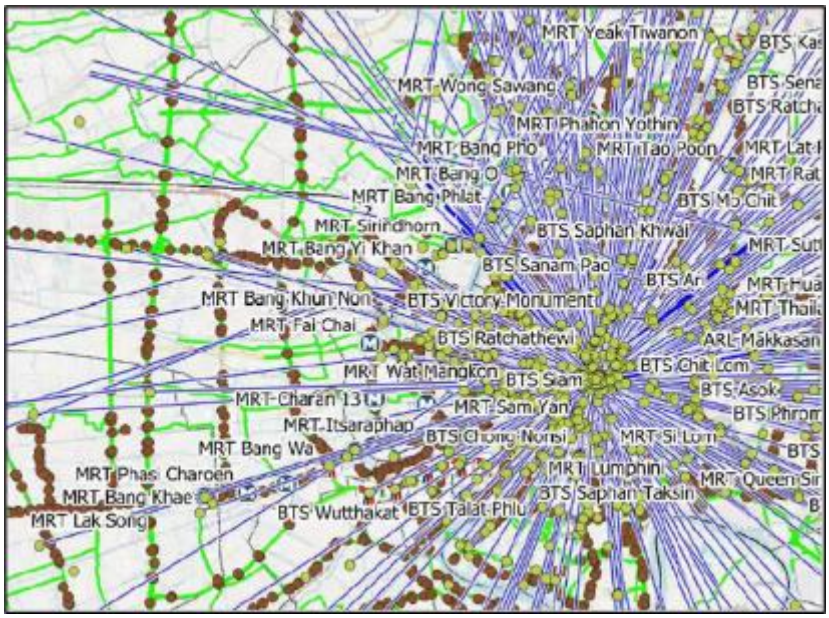


Figure 5-44 OD Analysis at BTS Siam Station

(2) MBD Analysis Method Manual

It was decided to examine the feeder bus from MRT as an MBD analysis that leads to the bus transportation plan in the 2nd technical assistance.

The analysis method focusing on the new MRT station was presented, indicating the necessity for a feeder bus to further improve the convenience of public transportation under the situation that the circulated line of MRT had been completed in December 2019.

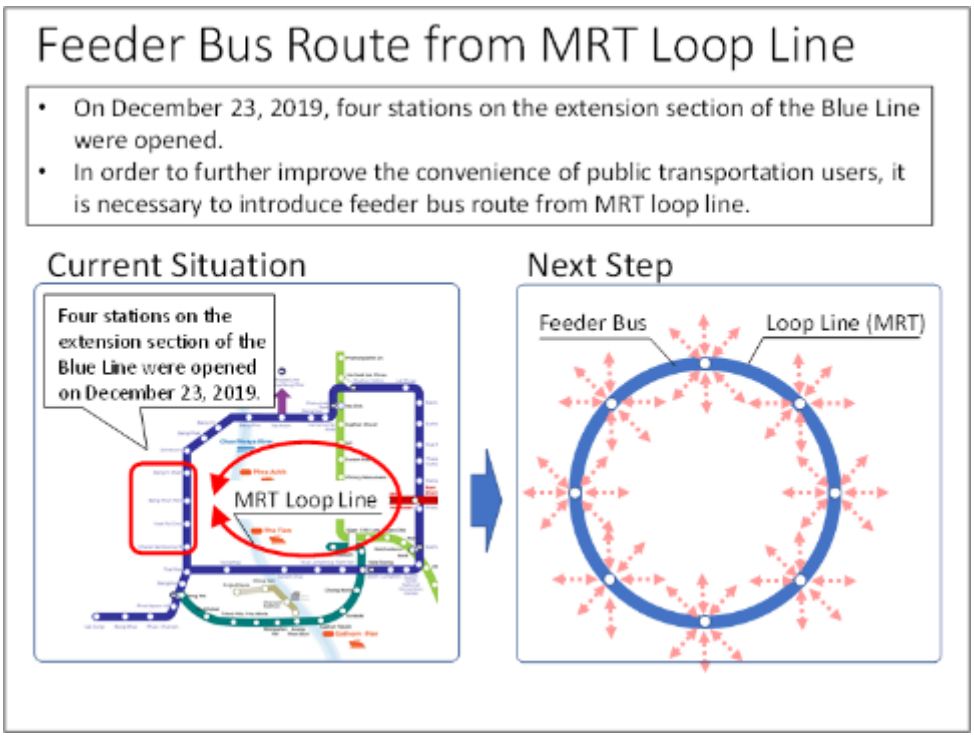


Figure 5-45 Feeder Traffic Analysis Method Part 1

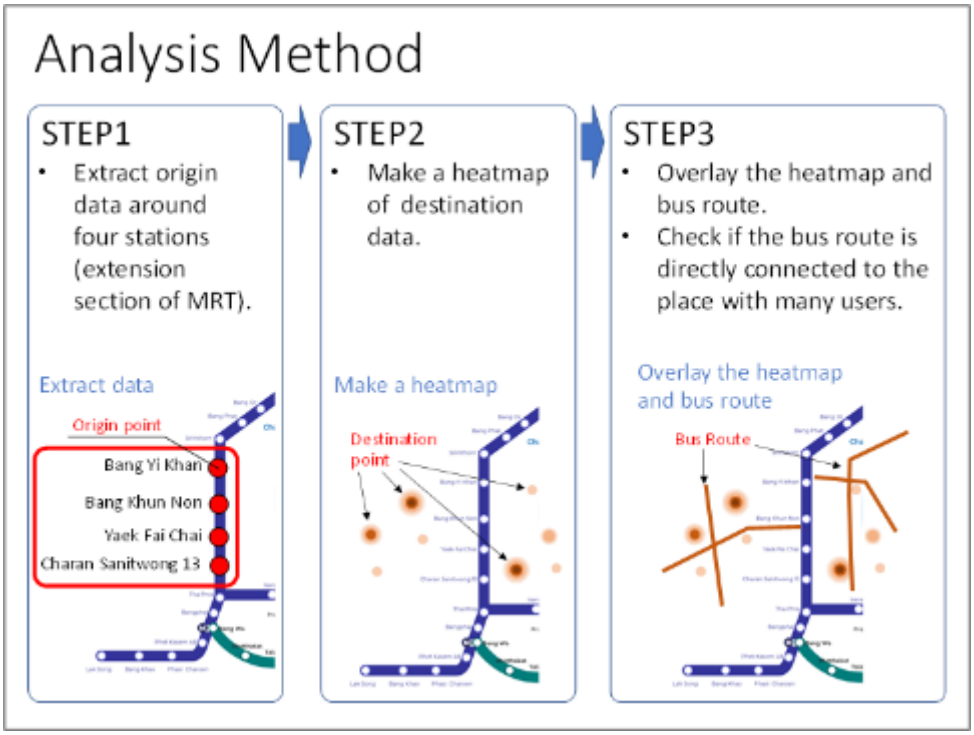


Figure 5-46 Feeder Traffic Analysis Method Part 2

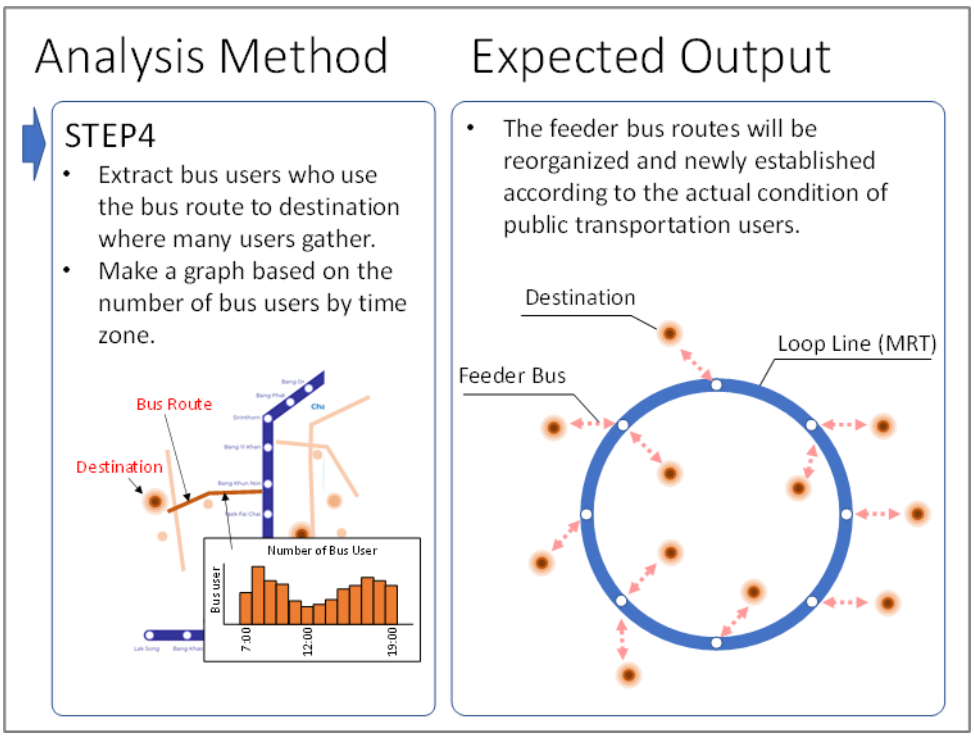


Figure 5-47 Feeder Traffic Analysis Method Part 3

6. Proposal of Possibility of Using MBD in the Transportation Field

6.1 Understanding Transportation Problems and Utilizing Traffic Analysis for Transportation Planning

Urban development and railway projects are progressing in Bangkok. It is an urgent issue to consider reorganizing bus routes based on these projects.

For example, railway lines and bus lines in Bangkok do not have a coordinated transportation system because the maintenance and operation bodies are different. There is a competition between lines and the main line and the feeder is not connected. Therefore, it is difficult to use the transportation system.

The possibilities of understanding of traffic problems and formulation of traffic planning to solve the problems are elaborated below, assuming using MBD obtained by Agoop SDK.

6.1.1 Understanding Traffic Problems

(1) Traffic Congestion

It is possible to visualize the flow of people such as origin destination points, routes, means of transportation, and speed by plotting information such as latitude / longitude / time / speed obtained from the app on a transportation network (road, bus route).

It is also possible to grasp the congestion points and analyze their effects (congestion due to vehicles detouring the congestion points, etc.) by displaying speed information on the road network.

(2) Possible Solutions to Transportation System That Is Difficult to Use

It is possible to add the number of application users and the staying time within a specific range by using the mesh for the latitude / longitude / time information obtained from the application.

It is possible to visualize the usage characteristics of transportation hubs by analyzing the time series changes in the number of users and staying time with GIS.

For example, it is possible to quantitatively analyze the problem of a transportation hub with a long waiting time, such as a situation where the connection between the bus and MRT is poor, or a situation where the supply is low for demand and passengers cannot get on the vehicle.

(3) Public Transport Blank Area

As shown in 5.3 MBD Analysis Method and Results, by creating a bus service area (bus stop walking area buffer) and superimposing it on the MBD heat map, it is

possible to grasp the distribution of app users outside the bus service area (bus service blank area).

It is possible to extract areas where the bus service is not provided even though there are many app users by this analysis.

6.1.2 Utilization for Transportation Planning

(1) Comparison to Conventional Traffic Survey

(1) Acquisition of floating population data, (2) cheaper and wide area survey, (3) continuous survey, as shown in Table 6-1, are possible by using MBD acquired by Agoop SDK, compared with conventional traffic survey methods such as probe car, traffic volume survey, etc. in traffic planning.

The traffic surveys that accurately identify more complicated traffic conditions in Bangkok are expected to be possible.

Table 6-1 Comparison to Conventional Traffic Survey

	Item	Conventional Traffic Survey and Issues		Expected results by utilizing MBD acquired by Agoop SDK
		Conventional method	Issues	
1	acquisition of floating population data	It is possible to grasp the road traffic conditions by acquiring and utilizing probe data.	It is not possible to grasp the situation other than the road.	It is possible to acquire floating population data and to grasp the situation other than road traffic by utilizing MBD.
2	cheaper and wide area survey	Traffic volume data can be acquired by traffic volume surveys and traffic counters.	Data can be acquired only at the survey section and the location where the traffic counter is installed, and it is costly to acquire data over a wide area.	It is possible to acquire data for the entire city and to easily acquire and utilize the data necessary for wide area urban development at low cost by utilizing MBD.
3	continuous survey	Traffic volume data of the survey time zone can be acquired by the traffic volume survey,	It costs a lot to carry out a continuous human-powered traffic survey.	It is possible to acquire continuous data. Useful analysis is possible by secondary processing of data, such as abnormality detection by comparing accumulated data with real-time data.

(2) Examination of Bus Schedule According to Demand

Currently, there is no bus timetable in Bangkok, and operation frequency (operation time interval) is set for operation management. Therefore, supply and demand do not match.

It can be expected to improve efficiency and convenience by operating the optimum

number of buses according to the number of bus users aggregated by time zone using MBD.

(3) Examination of Bus Routes to Public Transportation Blank Areas

It is possible to contribute to improving the convenience of public transportation by providing bus routes to the areas where bus services are not provided despite the large number of app users, which is mentioned in 6.1.1 (3).

(4) Examination of Feeder Bus Routes

MRT and bus line are currently competing in Bangkok and there are few travel patterns between them such as connecting MRT and bus to destinations. It is necessary to have a public transportation plan that incorporates feeder buses to improve the convenience of public transportation.

It is possible to confirm how much demand is in which direction by analyzing OD from the railway station using MBD. The convenience of public transportation can be improved by planning the feeder bus route according to the demand.

There are plans to develop multiple railways in the future in Bangkok Various developments are underway under the basic concept of a multipolar urban structure in which satellite cities are located and connected by a transportation network. Incorporating feeder bus routes into these plans will lead to better public transport plans.

7. Survey Result and The Way Forward

7.1 Survey Result

7.1.1 Current Status of MBD Utilization in MOT

(1) Current Status of MBD Utilization in MOT

Current status of MBD utilization in the transportation field was confirmed through the meetings with MOT. As a result, Namtang's data has not yet been used in the transportation sector.

(2) Namtang Data Acquisition Status

Namtang's data amount was 11,105 in October 2019, which is the largest amount of data, with average of 370 trip data per day.

The amount of data required for public transportation planning in Bangkok is 50,000 trip data per day as shown in the figure below.

Therefore, it is necessary to increase the number of users of Namtang app to utilize Namtang data for public transportation planning.

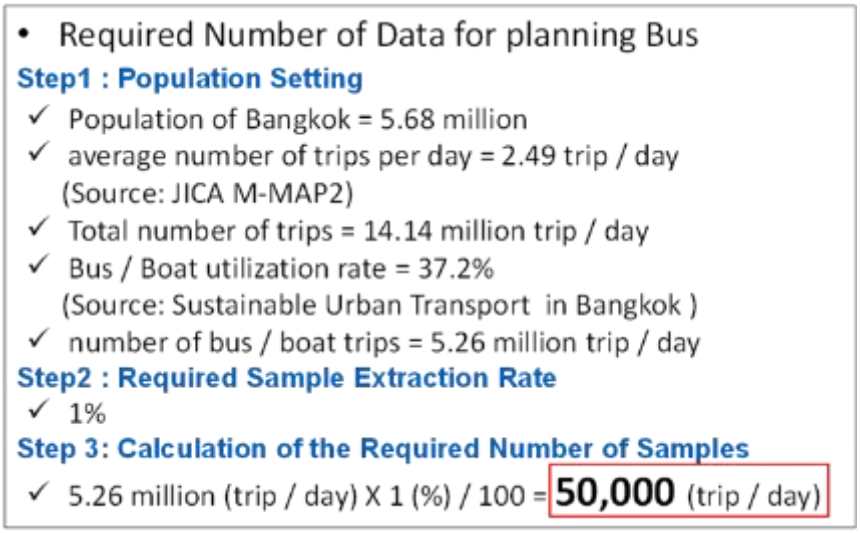


Figure 7-1 Amount of Data Required for Bus Planning in Bangkok

7.1.2 Activities Based on MOT's MBD Utilization Needs

(1) MOT's MBD Utilization Needs

The following needs for MBD utilization were found through the meetings with Mr. Sorapong Paitoonphong, Deputy Permanent Secretary.

- Utilization of Namtang data
- Technical assistance for utilizing MBD

The technical assistance using Namtang data was provided based on the needs.

(2) Technical Assistance for Utilizing MBD

1) Confirmation of Namtang Data

The Namtang data that can be obtained are mainly the latitude and longitude of origin and destination, which are the route search history data, and the time data. The technical assistance was provided for the utilization of MBD using these data.

2) Technical Assistance for Utilizing MBD

The technical assistance for utilizing MBD for OTP was provided twice.

In the first technical assistance, Namtang data was plotted on the base map to create a heat map after confirming the base map created by OTP. This analysis was to consider which bus routes should be added by comparing the bus routes and the distribution of people. It aims to lead to the plans for improving the convenience of public transportation.

In the second technical support, a buffer centered on the railway station was created, and OD analysis of the railway station users was carried out. This analysis leads to the planning of feeder bus routes with origin and destination at railway stations.

7.1.3 Report at the 15th ASEAN-Japan Experts Group Meeting on Information Platform for Transport Statistics

ASEAN-Japan Experts Group Meeting on Information Platform for Transport Statistics was attended by the traffic administration officers of Japan, ASEAN countries and ASEAN secretariat as part of the “Information Platform for Transport Statistics”, which is one of the projects based on ASEAN-JAPAN Transport Partnership. It is a place to share information and exchange opinions related to the transport statistical information.

The results of this work were reported at this meeting as the utilization of MBD for transportation planning. The presentation materials are as shown below.

Current situation of "Project for Applying Mobile Data for Transport Planning"

17 February, 2021

NIPPON KOEI

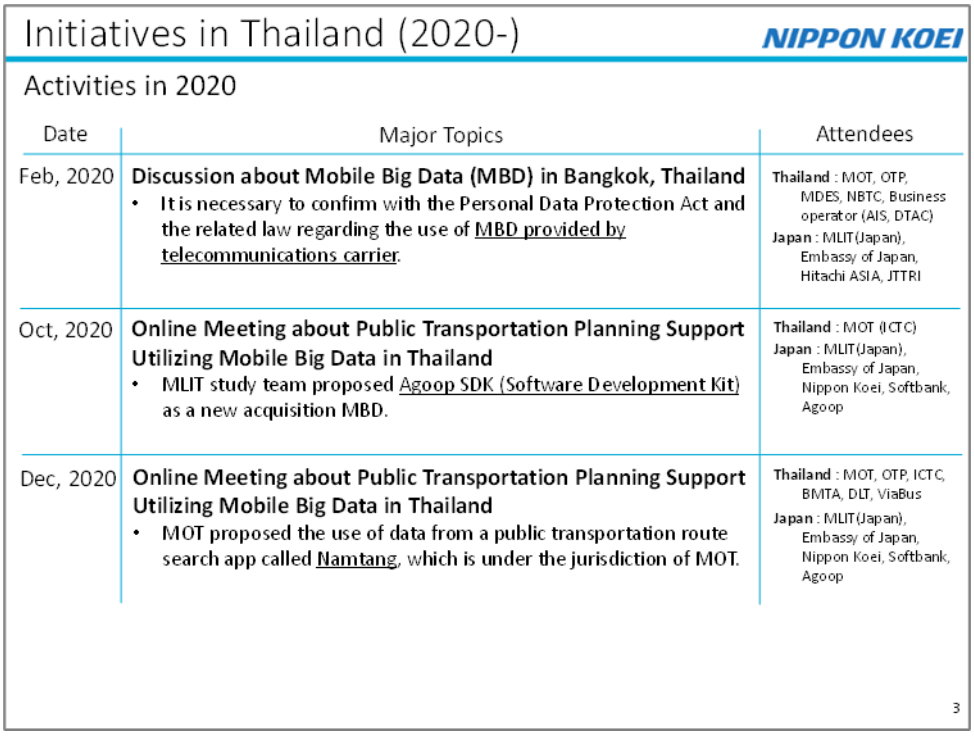
Project Background

NIPPON KOEI

Nov, 2018	**16th ASEAN-Japan Transport Ministers Meeting in Bangkok, Thailand** • Project for Applying Mobile Data for Transport Planning was approved.	
Jan, 2019	**ASEAN-Japan Seminar on Utilization of Mobile Phone Big-Data (MBD) for Transport Planning in Hanoi, Vietnam** • The building traffic statistics by big data obtainable in many forms, and the prospects of transportation and tourism by using the latest data were presented and discussed in this seminar.	
Jan, 2020	**ASEAN-Japan Seminar on Utilization of Mobile Big Data for Transportation Planning in Bangkok, Thailand** • The handling of personal information in mobile big data were presented and discussed in this seminar.	

2

Figure 7-2 Current Situation of Utilization of MBD for Transportation Planning Part 1



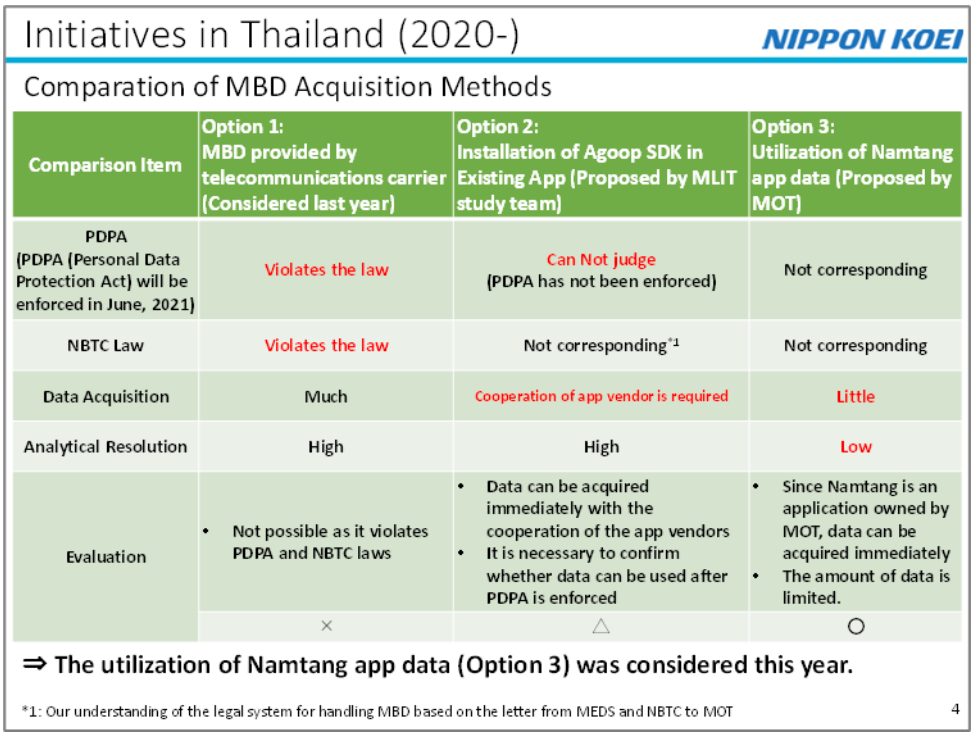
Initiatives in Thailand (2020-)

NIPPON KOEI

Activities in 2020

Date	Major Topics	Attendees
Feb, 2020	**Discussion about Mobile Big Data (MBD) in Bangkok, Thailand** • It is necessary to confirm with the Personal Data Protection Act and the related law regarding the use of MBD provided by telecommunications carrier.	**Thailand** : MOT, OTP, MDES, NBTC, Business operator (AIS, DTAC) **Japan** : MLIT(Japan), Embassy of Japan, Hitachi ASIA, JTTRI
Oct, 2020	**Online Meeting about Public Transportation Planning Support Utilizing Mobile Big Data in Thailand** • MLIT study team proposed Agoop SDK (Software Development Kit) as a new acquisition MBD.	**Thailand** : MOT (ICTC) **Japan** : MLIT(Japan), Embassy of Japan, Nippon Koei, Softbank, Agoop
Dec, 2020	**Online Meeting about Public Transportation Planning Support Utilizing Mobile Big Data in Thailand** • MOT proposed the use of data from a public transportation route search app called Namtang, which is under the jurisdiction of MOT.	**Thailand** : MOT, OTP, ICTC, BMTA, DLT, ViaBus **Japan** : MLIT(Japan), Embassy of Japan, Nippon Koei, Softbank, Agoop

3



Initiatives in Thailand (2020-)

NIPPON KOEI

Comparation of MBD Acquisition Methods

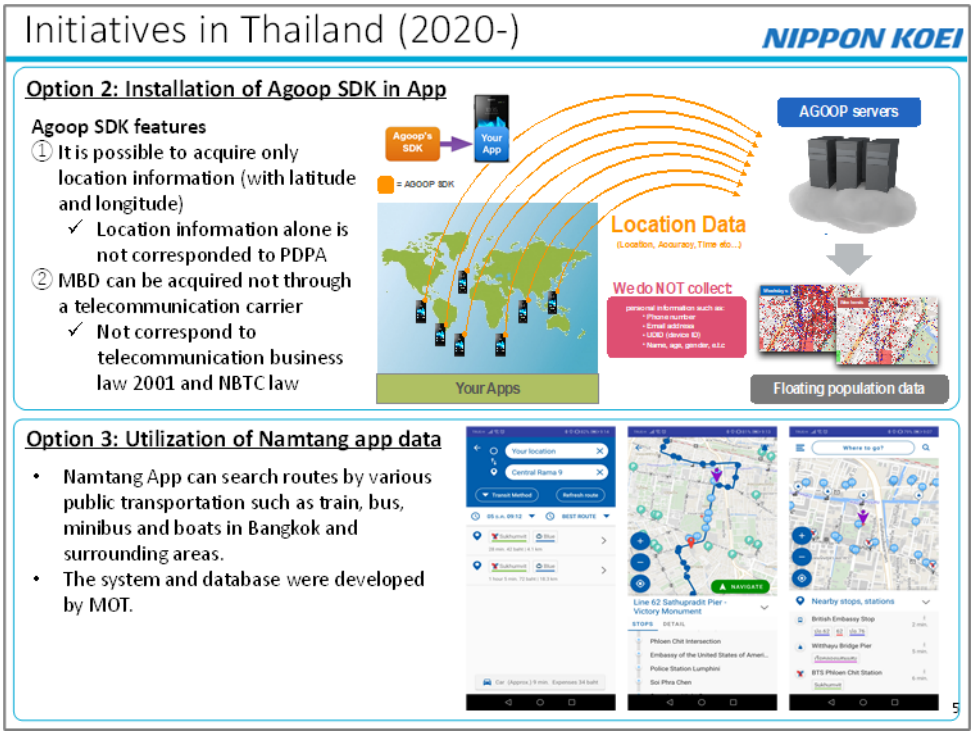
Comparison Item	Option 1: MBD provided by telecommunications carrier (Considered last year)	Option 2: Installation of Agoop SDK in Existing App (Proposed by MLIT study team)	Option 3: Utilization of Namtang app data (Proposed by MOT)
PDPA (PDPA (Personal Data Protection Act) will be enforced in June, 2021)	Violates the law	Can Not judge (PDPA has not been enforced)	Not corresponding
NBTC Law	Violates the law	Not corresponding*1	Not corresponding
Data Acquisition	Much	Cooperation of app vendor is required	Little
Analytical Resolution	High	High	Low
Evaluation	• Not possible as it violates PDPA and NBTC laws	• Data can be acquired immediately with the cooperation of the app vendors • It is necessary to confirm whether data can be used after PDPA is enforced	• Since Namtang is an application owned by MOT, data can be acquired immediately • The amount of data is limited.
	×	△	○

⇒ **The utilization of Namtang app data (Option 3) was considered this year.**

*1: Our understanding of the legal system for handling MBD based on the letter from MEDS and NBTC to MOT

4

Figure 7-3 Current Situation of Utilization of MBD for Transportation Planning Part 2



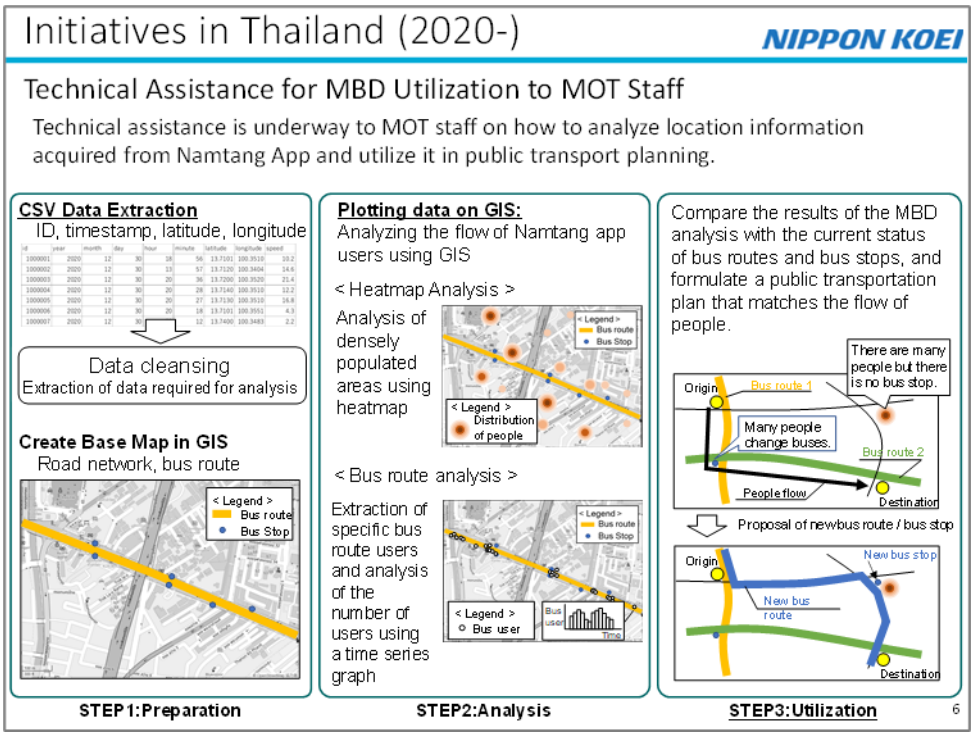


Figure 7-4 Current Situation of Utilization of MBD for Transportation Planning Part 3

Initiatives in Viet Nam(2020-)

NIPPON KOEI

Activities in 2020

Date	Major Topics	Attendees
Feb, 2020	**Meeting about Utilizing People Flowing Map in Danang, Vietnam** • The meeting purpose is to collect information for contributing to the urban development of in Da Nang by exchanging opinions on the utilization of floating population data. < Related Department > • 4th Feb: MOC (Ministry of Construction) • 7th Feb: DOIC (Department of Information and Communications) • 7th Feb: DOT (Department of Transportation) • 7th Feb: DOC (Department of Construction) • 11th Feb: DOT (Department of Tourism)	Japan : JICA Study Team (Softbank, Agoop, Nippon Koei)
Dec, 2020	**Online Meeting about Utilizing People Flowing Map in Danang** • Exchanged Information and Opinion for People Floating Map/Data Utilization in Da Nang.	Viet Nam : DOIC Japan : JICA Study Team (Softbank, Agoop, Nippon Koei)

7

Initiatives in Viet Nam (2020-)

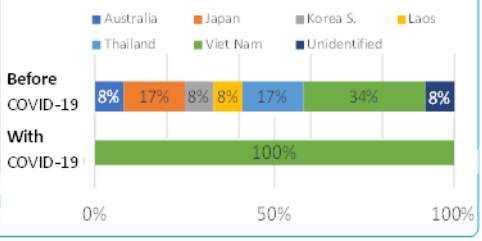
NIPPON KOEI

Analysis of the impact of COVID-19 using MBD in Danang

Extraction of bus route 01 (Da Nang – Hoi An) user and nationality analysis

< Before COVID-19 >
Visitors from various countries used buses

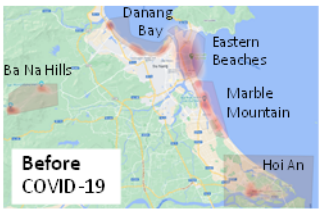
< With COVID-19 >
Only Vietnamese people use buses.



Comparison of the number of visitors to tourist spots

< Before COVID-19 >
Many people gathered at tourist spots on holiday.

< With COVID-19 >
The number of visitors has decreased significantly .



Heatmap in Danang (Weekend)

Comparison of Visitors

	Before COVID-19	With COVID-19	Decrease Rate
Ba Na Hills	13	0	100%
Danang Bay	47	6	87%
Marble Mountain	57	2	96%
Eastern Beaches	223	8	96%
Hoi An	129	3	98%

8

Figure 7-5 Current Situation of Utilization of MBD for Transportation Planning Part 4

7.2 The Way Foward

The following comments were made at the meeting with OTP held on March 17, 2021.

- OTP staff became aware that there are issues regarding the quantity and quality of Namtang's data, and were be able to understand the method and utilization of MBD analysis by the technical assistance.
- MBD analysis technology will be utilized to solve traffic congestion in Bangkok in the future.

It was announced that MOT will consider formulating a public transport plan utilizing MBD. Then, the study to support the formulation of public transport plan utilizing MBD in Thailand has been completed.