otp
Office of Transport and Traffic Policy and Planning



ANNUAL REPORT 2022

OTP : We drive Thailand's Transport for better Life

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Otpthailand

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Office of Transport and Traffic Policy and Planning



Forging ahead with our mission throughstrategyto achieve goals



Office of Transport and Traffic Policy and Planning (OTP)

The Office of Transport and Traffic Policy and Planning (OTP), the Ministry of Transport is responsible for recommending policies and plans for land, rail, water and air transportation to the implementation in order that the development of transport infrastructure would be supportive part for economy and social development. The mutual goal is to increase the quality of life of the people. This transport infrastructure investment has high expectati on from the government and the people as it is the catalyst for economy, job opportunity, budget spreading, and safety in lives and properties of the people. Therefore, the OTP thus gives the priority to the driving of policies and plans for actual implementation under the transport infrastructure development towards the sustainable development.

Throughout 2022, OTP proposed policies, plans, projects, and various activities for sustainable development of transport sector by setting up transport infrastructure development plan of Thailand (2015 - 2022) for utilizing as the framework for development foundation in the future. Furthermore, the pushing of national rail system development, transportation safety and security for people confidence, and common ticketing system development for elevating quality of travel. In addition, the development of the regional transportation system for connecting the economy, the management of land traffic, the development of transport and traffic and transport infrastructure facilities, as well as the development of transport information databases for supporting policy decision of the MOT.

This annual report compiles achievements related to the development of transport infrastructure in 2022 to spread to the public, agencies, and interested individuals on related information of the overall development in transport sector.

Contents



2 Preface

4 Organization Chart Ministry of Transport

5 Organization Chart Office of Transport and Traffic Policy and Planning (OTP)

6 Executives

9 OTP History

12 Bureau of Planning

21 Bureau of Safety Planning

28 Common Ticketing Service Office

31 Bureau of Regional Transport and Traffic System Promotion

36 Division of Land Traffic Management

40 Division of Transport and Traffic System Development

47 Transport and Traffic Information Technology Center

Organization Chart Ministry of Transport



Office of the Minister

Administration

- Office of the Permanent Secretary
- Office of Transport and Traffic Policy and Planning

Infrastructure

- Department of Highways
- Department of Rural Roads

Transportation

- Department of Land Transport
- Marine Department
- Department of Airport
- Department of Rail Trransport

State Enterpris

Land Transportation

- Expressway Authority of Thailand
- Bangkok Mass Transit Authority
- Transport Company Limited

Rail Transportation

- State Railway of Thailand
- S.R.T. Electrifed Train Company Limited
- Mass Rapid Transit Authority of Thailand
- S.R.T. Assat Company Limited

Water Transportation

- Port Authority of Thailand

Air Transportation

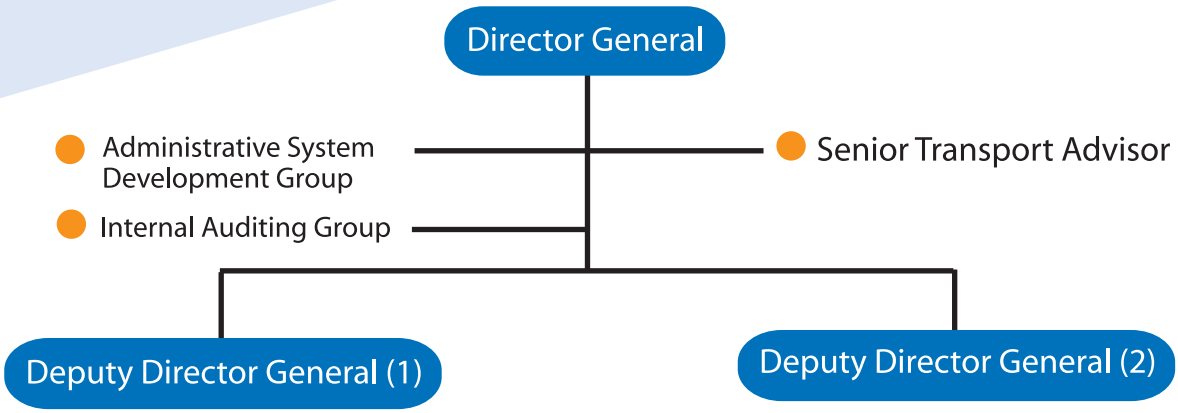
- Civil Aviation Training Center
- Aeronautical Radio of Thailand Limited
- Airports of Thailand Public Company Limited
- Suvarnabhumi Airport Hotel Company Limited

2 Independent Entities

- Rail Technology Research and Development Agency (Public Organization)
- Civil Aviation Authority of Thailand

Organization Chart Office of Transport and Traffic Policy and Planning (OTP)

Office of Transport and Traffic Policy and Planning



- Bureau of Central Administration
- Transport and Traffic Information Technology Center
- Common Ticket Service Office
- Bureau of Regional Transport and Traffic System Promotion
- Division of Land Traffic Management
- Division of Transport and Traffic System Development
- Bureau of Safety Planning
- Bureau of Planning

Executives

1 oct 21 – 30 sep 22

Office of Transport and Traffic Policy and Planning

1



2



3



4



1. Mr. Panya Chupanit
   Director – General

2. Mrs. Wilairat Sirisoponsilp
   Deputy Director – General

3. Mr. Surapong Meantmitr
   Deputy Director – General

4. Miss Luksanawadee Tanamee
   Transport Technical Officer,
   Advisory Level
   (31 March – 30 September 2022)

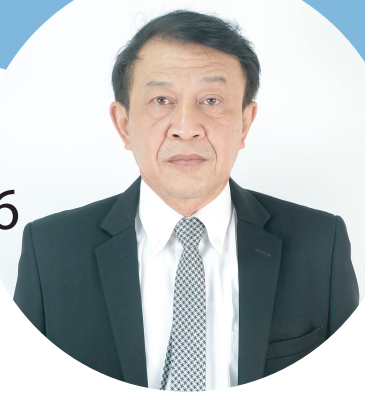
Executives

1 oct 21 – 30 sep 22

5



6



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5. Mrs. Phanit Mungmee
Director, Bureau of Central Administration

6. Mr. Sirigate Apirat
Director, Division of Land Traffic Management

7. Ms. Krittika Buranadis
Director, Bureau of Safety Planning

8. (Vacancy)
Director, Bureau of Planning

9. Mr. Roengsak Thongsom
Director, Bureau of Transport and Traffic System Development

Executives

1 oct 21 – 30 sep 22

10



11



12



13



14



10. Ms.Karuna Niam-iam
Director, Bureau of Common Ticket Service Office

11. Miss Luksanawadee Tanamee
Director, Transport and Traffic Information Technology Center

12. Mr. Jiraroth Sukolrat
Director, Bureau of Regional Transport and Traffic System Promotion

13. Mr. Bumcha Maneekum
Chief of Administraive Development

14. Ms. Pinyada Aiemhem
Chief of internal Audit



History

The Office of Transport and Traffic Policy and Planning (OTP), Ministry of Transport, was established pursuant to the Government Agencies' Restructuring Act of B.E. 2545 (2002) and the Reassignment of Administration, Duties, Powers and Authorities ofGovernment Agencies' Restructuring Act of B.E.2545 (2002) Royal Decree of B.E. 2545 (2002). These laws authorized the merging of the merging of the following three government agencies: the Office of the Commission for the Management of Land Traffic under the Office of the Prime Minister, constituents of the Office of the Maritime Promotion Commission, the latter two offices coming under the former Ministry of Transport and Communications.

Vision

"To be the leading organization in setting the direction for the development of the country' stransport and traffic systems"

Missions

1. To suggest policy measures, standards and integration of transport and traffic plan including driven into practice

2. To promote safety and the environment in transport and traffic systems

3. To establish, develop, and disseminate data, information, and knowledge management in transport and traffic

Strategies

1. Suitable suggestions on transport and traffic policy, plan, measure, and standard for national sustainable development

2. Transport and traffic development planning through study, research, and technology and innovation development for convenient, rapid, safe, and economical transport in consideration of qualityof environment, convenience of people travelling, and supporting the mission of the Ministry of Transport

3. The coordination, monitoring and evaluation to guide and increase the efficiency of the policy, plan, measure, and standard in transport and traffic

4. The development of efficient organization, knowledge management and human resource development

Objectives

1. To construct a policy framework for national transport and traffic policy, plan, measure and standard development

2. To provide study, research and technology and innovation development for convenient, rapid, safe, and environment friendly development in transport

3. To develop, establish, and disseminate data, information, and knowledge management in transport and traffic

4. To establish system for coordination, monitoring, and evaluation in plans, project, measure and standard that is efficient

5. To encourage efficient organization and human resource management

Organization Value : Teamwork Open-mind Partnership

T - Team Work : We emphasize on working as a team toward the same goal with responsibility and goal-orientation.

O - Open-mind : We emphasize on working open-mindedly and accepting opinions of others, which leads to the integration and sharing of knowledge.

P - Partnership : We emphasize on cooperation and participation at work.

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Office of Transport and Traffic Policy and Planning



Transport infrastructure development for sustainable transport



1. Project on Expanding Transport Cooperation through Partnerships for Infrastructure and the Ministry of Transport (P4I – MOT)

1. Background

Project on Expanding Transport Cooperation through Partnerships for Infrastructure and the Ministry of Transport (P4I - MOT) is in line with the Thailand - Australia Agreement on Development Co - operation signed on 2 February 1989, Memorandum of Understanding relating to Trilateral Development Cooperation signed on 4 January 2002 and the Joint Declaration on a Strategic Partnership signed on 13 November 2020 between our two Governments. The P4I - MOT program is one of the projects under the Australian Government's Partnerships for Infrastructure (P4I) initiative which aims to strengthen Australia's role in the Greater Mekong Subregion and ASEAN including in the framework of strategic economic cooperation Ayeyawady - Chao Phraya - Mekong (Ayeyawady - Chao Phraya - Mekong Economic Cooperation Strategy : ACMECS)

2. Objectives

To support the development of transportation policies and infrastructure in Thailand. By participating in policy discussions and organizing activities to increase the capacity of personnel and organizations to promote sustainable transport infrastructure development. The project is part of the Partnership for Infrastructure (P4I) initiative of the Australian Government in collaboration with the Thai Government to support inclusive growth through sustainable infrastructure development in Southeast Asia.

3. Duration

The P4I - MOT project has a 3-year framework (2022 - 2024). The Exchange of Notes (EN) has been signed in both English and Thai versions by the Australian Ambassador to Thailand and the Director General of the Thailand International Cooperation Agency, Ministry of Foreign Affairs on August 26, 2022





4. Project Implementation

The Australian Government will support a budget of up to $5 million (approximately 115 million baht) to implement projects in the form of personnel support, technical support and financial support as appropriate. Moreover, the initiatives will support foreign experts to perform their duties under the P4I - MOT project. The Office of Transport and Traffic Policy and Planning (OTP) will help coordinate, support and facilitate the implementation of the project.

5. Implementing Agency

The Australian Government has commissioned the Department of Foreign Affairs and Trade (DFAT) to undertake this project. In part, the Thai Government has assigned OTP, the Ministry of Transport as the implementing agency.

6. Project Implementation Mechanism

The implementing agency will jointly prepare a 3 years action plan and established a joint coordinating committee between Thailand and Australia (Joint Coordinating Committee : JCC). JCC consist of Thai representatives from agencies under the Ministry of Transport, representatives from P4I project, and also the Australian Embassy in Thailand to jointly supervise the project and advise on the implementation of activities according to the plan.

7. Action Plan

Initially, consists of 4 activities:

1. Activity 1 : Capacity Building Program
2. Activity 2 : Roadmap to Transition Public Buses to Electric Vehicles
3. Activity 3 : Review 20-year EV Development Plan for Public Transport (road, rail, and water)
4. Activity 4 : Address Free Flow Tolling Implementation Issues



Currently, the consultant is carrying out Activity 2 : Roadmap to Transition Public Buses to Electric Vehicles. The Activity includes identifying stakeholders, review the operations of foreign countries and the environmental system of electric buses. Workshops were conducted with relevant stakeholders to share opinions and suggestions as an input for developing a Roadmap. The Activity 2 : Capacity Building Program will be implemented in early 2023. For Activity 3 and 4, details activities will be considered upon completion of Activities 1 and 2. Detailed scope of work (TOR) will be established for each activity to propose to the JCC for approval before starting further activities.

Cooperation under the P4I - MOT project will help promote the policy of the Ministry of Transport, encourage development of infrastructure and transportation services and also increase the capacity of personnel and agencies that will ultimately lead to the sustainable and efficient transport infrastructure development in the future.

2. Technical Assistance from U.S. Trade and Development Agency (USTDA) to conduct study related to the implement of Thailand Integrated Logistics and Intermodal Transport Development Plan

1. Project Background

Ministry of Transport (MOT) has policy to promote modal shift from road to rail and water transport as well as supporting intermodal transport to utilize rail infrastructure and reduce transportation costs. U.S. Trade and Development Agency (USTDA) has granted the Technical Assistance (TA) to support MOT in study and provides recommendations to achieve greater intermodal transport of goods by rail.

2. Objectives

To provide OTP with specific recommended actions to achieve greater intermodal transport of goods by rail. The benefits of intermodal transport includes reduction in total transport costs, harmful emissions, reduce transit time, road accidents and promote Thailand as a regional transport hub. The study will focus on the Port of Laem Chabang, Suvarnabhumi Airport and inland dry ports along major economic corridors.

3. Grant Fund

The total amount of 1,360,740 USD (Approx. 51 Million Baht)

4. Study Period

Project timeline for 14 months

5. Terms of Reference

- To study, review documents, policies, strategies, reports and stakeholder consultations.
- To study and review current intermodal transport practices for the following four market segments.

Market Segment 1 : Import/Export/Landbridge by Marine

Market Segment 2 : Domestic Movements by road, rail, inland waterway, and coastal shipping

Market Segment 3 : Import/Export/Transit by Land

Market Segment 4 : Import/Export/Transit by Air

- Traffic projections for each market segment.
- To develop the implementation plan and identify the necessary measures to promote freight transport shifting from road to rail.
- To propose Pilot Integrated Logistics & Intermodal Transport Center (ILIT) up to 3 sites with technical evaluation, financing modalities, economic evaluation, preliminary environmental and social impact assessment to demonstrate attractiveness of cooperative operations between road carriers and SRT.

6. Major Corridors for study

Corridor no. 1 Freight transport from Laem Chabang Port Nong Khai province (by rail and road)

Corridor no. 2 Cargo transport from Suvarnabhumi Airport Industrial Estates and industrial parks in the Eastern Economic Corridor (EEC)

Corridor no. 3 Freight transport from manufacturers in the EEC and from East-West of the Gulf of Thailand and link to Landbridge (Chumphon-Ranong)

Corridor no. 4 Freight transport from Southern Economic Corridor : SEC (Chumphon, Ranong, Surat Thani and Nakhon Si Thammarat province)

7. Importance of developing the intermodal transport network

- Reducing transport costs by shifting freight movements from road to rail

Decreasing harmful emissions from road transport as a consequence of shifting intermodal freight movements to rail

- Improving safety by shifting cargo from road to rail, minimizing the cost of road accidents.
- Establishing Thailand as a regional hub focusing on the port of Laem Chabang

8. Expected Benefits

- Recommendations to promote modal shift from road to rail by identifying infrastructure, technology and operations improvement to promote intermodal transport in Thailand.
- Pilot project on Integrated Logistics & Intermodal Transport Center (ILIT) up to 3 sites to demonstrate attractiveness of cooperative operations between road carriers and SRT

9. Current Status

The cabinet approved the Grant Agreement on 1st November 2022 and approved MOT/ delegate for grant signing which expect to be hold in 2022. Next, USTDA will announce Request for Proposal (RFP) to invite interested consultant for technical proposals submission.

3. Implementation of the Ministry of Transport's Strategic Plan to Support the Development of the National Logistics System No. 3 B.E. 2560 – 2565 (2017 – 2022)

According to cabinet resolution on March 12, 2021 (B.E. 2564), has approved the (draft) master plan under the national strategy and requested government agencies to revise the level 3 plan along with the cabinet resolution on December 4, 2017 (B.E. 2560), in accordance with the national strategy and master plan under the national strategy. Therefore, the Ministry of Transport by the District Office has collaborated with relevant agencies under the Ministry of Transport to improve the Ministry of Transport's strategic plan to support the development of the National Logistics System No. 3 B.E. 2560 - 2565 (2017 - 2022) by adding plans/projects to be implemented in the fiscal year 2022 in order to comply with the aforementioned Cabinet resolution as well as to develop a complete logistics system in continuation of the previous plan. It should eliminate the Missing Link problem and support the "Super Cluster" promotion policy set by the government. It is the engine that drives the country's economy in the future in Thailand's 4.0 era. It is to enhance the country's competitiveness to develop into a digital economy under the vision "Continuous, Connected, Driven, Sustainable" It consists of 4 key strategics totaling 295 plans/projects. The total amount is 1,000,307.93 million baht.

The Office of Transport and Traffic Policy and Planning (OTP) has summarized the results of plans/projects/measures under the Ministry of Transport Strategic Plan No. 3 of agencies under the Ministry of Transport as of September 2022. The progress in operating results are as follows:

- 133 projects, or 45 percent, were completed, including the coastal port development projects (Port A) at Laem Chabang Port, the 20G coastal terminal improvement and development project, The study of agricultural commodity standards system and cold chain management project, The U - Tapao railway station construction project, Supplement of training tools in bulk carriers simulated project of container vessel, general cargo vessel, passenger vessel and ferry, The study of enhancing the quality standard of transportation services via trucks to increase road transport efficiency in Thailand.
- 83 projects in operation or 28 percent. For example, the construction of ten double - track railways project, Laem Chabang Port Development Project (Stage 3), the Laem Chabang Single Rail Transfer Operator (SRTO) development project, the airport efficiency and capacity - building project, the highways and rural roads construction project, the Nakhon Phanom transport border trade Center project.
- 18 projects or 6 percent were postponed. For instance,

1) The regional freight terminal project was postponed because the Ministry of Transport has requested to review the seamless location of railway connections. Therefore, this project is under review for further integration.

2) No. 3701 Highway, Railway Overpassed project, the Bangkok - Chonburi Motorway (No. 7), due to the design modification to support to the high - speed rail project connected linking three airports.

3) Enhancing transport efficiency project in Pa Sak River by constructing a bank to investigate a waterway (long term) After the monitoring in Phases 1 and 2, the budget expenditure in 2033 - 2036 was revised for further processing.

- 16 projects or 6 percent were canceled. For example,

1) The rural road construction project to support the 4th Thai - Lao Friendship Bridge over the Mekong River, Chiang Rai province. According to the rural road cannot be expanded wider which is not suitable for truck routes.

2) Truck Queuing Yard developing project to enter each loading port (Terminal) in Laem Chabang Port was canceled because the Port Authority of Thailand already applied a truck queuing reservation system.

3) Furthermore, there are 45 projects, or 15 percent that are planned to be implemented in the fiscal year 2023 onwards.

Currently, the OTP has prepared the Action Plan for the Development of the National Logistics System No. 4 B.E. 2566 - 2570 (2023 - 2027) which part of the Ministry of Transport. After collaborating with relevant agencies under the Ministry of Transport and investigating the relevant project according to the framework, guidelines, goals, and indicators that conform to Thailand's logistics system development action plan B.E. 2566 - 2570 (2023 - 2027) which be improved by the Office of the National Economic and Social Development Council (NESDC). Meanwhile, NESDC is in the process of presenting (draft) an action plan for the development of Thailand's logistics system B.E. 2566 - 2570 (2023 - 2027) to the Cabinet for further approvement.

4. Annual Budget Expenditure: The Integrated Plan for Transport and Logistics Development in Fiscal Year 2022

Office of Transport and Traffic Policy and Planning (OTP) is the host organization for annual budget expenditure: The Integrated Plan for Transport and Logistics Development in Fiscal Year 2022, which has 2 operational goals as follows: 1) Thailand's transportation network become connected, convenient, safe, and efficient, which enable seamless travel in-house and neighboring countries. And 2) Logistics and supply chain management and trade facilitation to be efficient and meet international standards. There are budget units of 6 ministries (19 agencies), with a total of 52 projects and a total budget of 107,481.0312 million baht.

At the end of the 4th quarter (October 2020 - September 2021), the budget disbursement was 91,147.0543 million baht, accounting for 84.80 percent, which the amount is less than predetermined.

Currently, the Implementation of the projects under the integrated plan can be summarized as follows:

- The development of road infrastructure: the total length of roads is 1,563.7320 kilometers
- The development of railway infrastructure networks and necessary facilities supporting railways network: the total length of railway networks is 110.65 kilometers
- The development of maritime infrastructure and necessary facilities supporting the maritime network: 37 locations
- The development of passenger terminal: 1 Terminal
- The development of domestic Airports: 23 Airports
- Logistics and supply chain cost reduction of target establishments: 1,503.0000 million baht
- The number of successful business matching between Thai Logistics Providers and International Logistics Providers: 754 cases

Finally, the projects are under the integrated plan and still ongoing process. However, several projects have been delayed. All these causes of delays can be attributed to many more variables. Due to the Covid-19 pandemic outbreak, the flood situation and rising sea levels, land expropriation conflicts, et

5. OTP Annual Report 2022 (October 2021 – September 2022) By Investment Plant Group / Planning Bureau

As the Transport Academic Agency for policy and planning of Ministry of Transport, one of the main roles is to analyze, and reach suitable economic solution to mega transport infrastructure and services, including Public Private Partnership, along with National Policy, as well as advising management on appropriate approach to the State Enterprises restructuring in order to enhance their efficiency.

In 2022 fiscal year, Planning Bureau (Investment Plan Group) has proposed the project appraisal to support MOT and cabinet's decision making on transport policy and planning as follows:

Land Transport : Bangkok - Ban Chang Intercity Motorway Project (Link to the international airport of U-Tapao), Intercity Motorway Project (Bang Khun Thian - Bang Bua Thong Section), Operation and Maintenance of Intercity Motorway Project (Bang Khun Thian - Ban Phaeo Section), Chalong Rat - Nakhon Nayok - Saraburi Highway Extension Project (Chatu Chot - Lam Luk Ka Section), Koh Lanta Bridge between Lanta Islands and Rest area projects in Bang Yai - Kanchanaburi and Bang Pa-In - Nakhon Ratchasima Intercity Motorway.

Rail Transport : Green Line Skytrain Project, Inland Container Depot (Lat Krabang).

Water transport : Laem Chabang Port (A0, A2, B1 and B2), National Shipping Line.

Air Transport : Don Mueang Development Project Phase 3 and Ground service equipment, passenger service and Cargo at Suvarnabhumi Airport, Air Navigation Services of U-Tapao Airport.

These mega-projects would contribute to Thailand's efficient, safe and seamless transport sector. As a key enable for its ocial and economic growth, transport will enhance Thailand's supply chain connectivity for goods and services of domestic and overseas markets, especially those with its neighboring countries.

6. The Office of Transport and Traffic Policy and Planning Action Plan 2023 – 2027

OTP has developed The Office of Transport and Traffic Policy and Planning Action Plan 2023 - 2027 (Action Plan) to monitor and evaluation the implementation of the plan in the fiscal year 2023 - 2027 in accordance with the Thailand 20 years National Strategy (2018 - 2037),

the 13th National Economic and Social Development Plan (2023 - 2027) and the Thailand's 20-year development strategy for transport systems (2018 - 2037). This Action Plan has a total of 61 projects/activities with the following details:

1. Vision

"To be the leading organization in setting the direction for the development of the country's transportation" by having a Key Performance Index (KPI) as "Lead Organization" with targets as followed

2. Mission

1) To suggest policy, measure, standard of transport and traffic plan including driven into practice.

2) Research and development of technology and innovation.

3) To promote safety and environmental quality in the transportation system.

4) Development and dissemination of information and knowledge in transport and traffic.

3 Value

"OTP to TOP" Build a good team, Build opportunity and Build professionalism

T - Teamwork is Build a good team Trusting each other, cooperate in every levels, work participation and build a network of collaboration, listening to each other's opinion and getting results for the organization goal.

O - Opportunity is Build opportunity in learning together and emphasize on creative communication.

P - Professional is Build professionalism know your role, be responsible, loyal, sociable, kind, thoughtful, living together in harmony and continuous self-development for building proficiency.

4. Estimate Budget for 2023 - 2027

Projects/activities in the fascial year 2023 - 2027 amounted to 61 projects/activities as mentioned above with budget of 2,041.209 million baht grouped by strategic issues



Transport Safety Plan and Implementation The Fiscal Year 2022

Office of Transport and Traffic Policy and Planning (OTP) has a crucial role in driving a number of transport plans of the Ministry of Transport (MOT) for experience of transport systems users, in terms of comfort, reliability, safety and above all convenience. During the festival and continuous holidays, OTP by the Bureau of Safety Planning unveiled the Facilitation and safety plan for providing a convenience and safe in public transport services during the long holidays. Nonetheless, enhancing transport safety of OTP involves collaboration with various agencies at all levels, such as the Road Safety Operation Center of Ministry of the Interior, Ministry of Public Health, Royal Thai Police, academic institutions and private sectors. As such, main contexts of transport safety implementation of OTP are as follows:

1. Facilitation and safety plan in public transportation services during the festival and continuous holidays 2021 and 2022

1.1 Results of the Implementation of facilitation and safety plan in public transportation services during the festival and continuous holidays 2020 and 2021

1.1.1 The Implementation results

1) Continuous holidays 2021 (21 - 24 October 2021), there were a total of 3,812,924 people. Traveling in Bangkok and surrounding areas of 3,240,371 people. Inter-provincial and intra-provincial travel of 559,656 people. International travel of 12,897 people. Traffic volume in - out of Bangkok on major highways and intercity expressways 10 points that are under the responsibility of the Department of Highways 4,056,170 vehicles and 4,925,221 vehicles in and out of Bangkok on expressways under the responsibility of expressway.

2) New Year 2022 (29 December 2021 - 4 January 2022), there were a total of 9,388,254 people. Traveling in Bangkok and surrounding areas of 7,282,334 people. Inter-provincial and intra-provincial travel of 1,987,330 people. International travel of 118,590 people. Traffic volume in - out of Bangkok on major highways and intercity expressways 10 points that are under the responsibility of the Department of Highways 7,540,156 vehicles and 8,529,725 vehicles in and out of Bangkok on expressways under the responsibility of expressway.

3) Chinese New Year 2022 (28 January 2021 - 1 February 2022), there were a total of 7,351,227 people. Traveling in Bangkok and surrounding areas of 6,278,522 people. Inter-provincial and intra-provincial travel of 1,021,478 people. International travel of 51,227 people. Traffic volume in - out of Bangkok on major highways and intercity expressways 10 points that are under the responsibility of the Department of Highways 5,251,944 vehicles and 6,748,751 vehicles in and out of Bangkok on expressways under the responsibility of expressway.

4) Songkran Festival 2022 (11 - 17 April 2022), there were a total of 8,567,848 people. Traveling in Bangkok and surrounding areas of 6,077,556 people. Inter-provincial and intra-provincial travel of 2,295,154 people. International travel of 195,138 people. Traffic volume in - out of Bangkok on major highways and intercity expressways 10 points that are under the responsibility of the Department of Highways 6,873,404 vehicles and 8,050,258 vehicles in and out of Bangkok on expressways under the responsibility of expressway.

5) Visakha Bucha Day 2022 (13 - 16 May 2022), there were a total of 5,889,218 people. Traveling in Bangkok and surrounding areas of 4,601,045 people. Inter-provincial and intra-provincial travel of 1,122,796 people. International travel of 165,377 people. Traffic volume in - out of Bangkok on major highways and intercity expressways 10 points that are under the responsibility of the Department of Highways 4,257,202 vehicles and 5,293,916 vehicles in and out of Bangkok on expressways under the responsibility of expressway.

6) Asarnha Bucha and Buddhist Lent Day 2022 (13 - 17 July 2022), there were a total of 8,570,586 people. Traveling in Bangkok and surrounding areas of 6,934,640 people. Inter-provincial and intra-provincial travel of 1,278,875 people. International travel of 357,071 people. Traffic volume in - out of Bangkok on major highways and intercity expressways 10 points that are under the responsibility of the Department of Highways 5,035,879 vehicles and 7,085,479 vehicles in and out of Bangkok on expressways under the responsibility of expressway.

7) HM King Maha Vajiralongkorn Phra Vajiraklaochaoyuhua's Birthday 2022 (28 - 31 July 2022), there were a total of 7,278,761 people. Traveling in Bangkok and surrounding areas of 5,509,618 people. Inter-provincial and intra-provincial travel of 1,469,451 people. International travel of 300,692 people. Traffic volume in - out of Bangkok on major highways

and intercity expressways 10 points that are under the responsibility of the Department of Highways 4,130,072 vehicles and 5,427,991 vehicles in and out of Bangkok on expressways under the responsibility of expressway.

8) Continuous holidays 2022 (13 - 16 October 2022), there were a total of 7,958,285 people. Traveling in Bangkok and surrounding areas of 6,181,147 people. Inter-provincial and intra-provincial travel of 1,374,929 people. International travel of 402,209 people. Traffic volume in - out of Bangkok on major highways and intercity expressways 10 points that are under the responsibility of the Department of Highways 3,967,559 vehicles and 5,396,729 vehicles in and out of Bangkok on expressways under the responsibility of expressway.

1.2 Road accidents statistics on MOT's roads during the festival and continuous holidays 2021 and 2022

1) Continuous holidays 2021 (21 - 24 October 2021), there were 220 accidents, 24 deaths and 145 injuries.

2) New Year 2022 (29 December 2021 - 4 January 2022), there were 1,651 accidents, 193 deaths and 1,801 injuries.

3) Chinese New Year 2022 (28 January 2021 - 1 February 2022), there were 78 accidents, 15 deaths and 79 injuries.

4) Songkran Festival 2022 (11 - 17 April 2022), there were 1,203 accidents, 186 deaths and 1,249 injuries.

5) Visakha Bucha Day 2022 (13 - 16 May 2022), there were 126 accidents, 24 deaths and 160 injuries.

6) Asarnha Bucha and Buddhist Lent Day 2022 (13 - 17 July 2022), there were 262 accidents, 42 deaths and 214 injuries.

7) HM King Maha Vajiralongkorn Phra Vajiraklaochaoyuhua's Birthday 2022 (28 - 31 July 2022), there were 189 accidents, 35 deaths and 185 injuries.

8) Continuous holidays 2022 (13 - 16 October 2022), there were 165 accidents, 19 deaths and 174 injuries.

2. Safety analysis of traffic accident situations on the road under the Ministry of Transport 2021

The OTP is in charge of traffic accident analysis on the MOT's roads. The safety analysis of traffic accident situations on the road under the Ministry of Transport 2021 has been publicize. The key findings include;

2.1 Overview of traffic accidents on MOT's roads

According to traffic accident report on roads under purview of MOT from the TRAMS system, there were a total of 20,475 road accidents in 2021 with 2,726 deaths and 15,108 injuries. The number of traffic accident in 2021 is compared to 2020, with accidents decreased by 6.78%, deaths decreased by 18.94% and injuries decreased by 16.01%

The top 3vehicles causing traffic accidents in 2020 are 4-wheeled pick-up trucks (35.43%), private cars/Taxis (24.20%), and motorcycles (16.78%). The top 5 assumptions contributing traffic accidents are driving too fast (74.82%), cutting off a car/people (7.84%), falling asleep while driving (4.76%), defective vehicle parts (3.76%) and Others/not specified (3.09%).

2.2 Road accident statistics in public buses

In 2021, the most accidents traffic accidents was contributed by 39 single-decker buses (41.94% of the total number of public buses), followed by 20 passenger vans (21.51%), 17 double-decker buses (18.28%).

2.3 Railroad crossing accidents

Accidents involving road vehicles colliding with trains at level crossings in 2021 found 40 cases, with 4 deaths and 21 injuries. The most accident spot was an unofficial railroad crossings.

2.4 Main factors contributing to road accidents

The findings found that people behaviors, vehicle conditions, and the road environment are the 3 main factors contributing to road accidents on the MOT's roads. In particular, the factor of risk-taking behaviors of drivers on the road often involved in the incident, such as exceeding the speed limit, cutting off a car/people, and drink driving.

transport infrastructure development in order to provide sufficient and safe

Bureau of Safety Planning is responsible for facilitating people in transport infrastructure development in order to provide sufficient and safe networks as well as create very less impact on environment. The promotion of better quality of life through the development of mass transit and public transport for passenger services and cargo transport in order to add opportunities in nation development or add chances for people to have more travel choices both in Bangkok and other regions.

1. Lesson learnt form the flooding impact on transport infrastructure under the responsibility of the MOT.

1.1 Results of flooding monitoring that impacted on transport infrastructure under the MOT responsibility indicate that the monitoring period begins from June to December every year. The period for nationwide monitoring begins from June to September. From October to December is the monitoring period for the southern part (Thai Gulf and Andaman Sea) of Thailand. As for the summer storm, the monitoring period is March to May every year. In summary, March to December covers the monitoring the possible flooding situations.

1.2 The management of disaster of the MOT composes of the preparation phase that involves (1) the setting up of the MOT Disaster Command Center (2) the preparation of the disaster management plan of the MOT and (3) the monitoring and reporting through Line Application. The Action Phase covers the facilitation and warning of flooding situation to the people. The closure of road, the installation of warning signs, the provision of staffs to facilitate the people on the roads, and other related activities are done. The rehabilitation phase involves the building back damaged transport infrastructure, the improvement of drainage system that the Department of Highways and the Department of Rural Roads proposed for the fiscal budget 2022 (Central budget for emergency situations announced by the disaster notices from the Ministry of Interior).

1.3 Lesson learnt points out the alleviation of previous risks and the prevention of the damages that may occur in the future. The causes of flooding on road networks can be categorized as (1) the drainage system that was not sufficient for water flows. (2) the overflow of water and (3) the high level of sea water. In addition, the construction of roads and the direction of water flow impacted the natural water circulation in lowland and the water ecosystem. The factors that involved flooding situation on the MOT road networks include (1) road construction in lowland or riverside or seaside areas (2) road construction crossed the natural water flow lines or road construction in parallel with river behind dam area of the Department of Irrigation (3) road construction crossed or traversed the rivers (main or branches of rivers) and (4) road construction through or around the hills.

2. The preparation and alleviation of flooding impacts in 2022

The Bureau of Safety Planning used the action plan to prepare for the effects of the storm that may occur and brought the structure of the disaster Command Center to direct the situations that may affect people travels. The coordination among agencies in the area to investigate and correct the problems instantly, the reporting involving routes and risky areas, the guideline for action, the management of instrument and the reporting of damages to other infrastructure as well as the reporting to the head of the Command Center through Line Application were executed.

3. The reporting of the preparation and the helping of people of the MOT

The Safety Planning Bureau reported the preparation and the helping of people of the MOT in the case of flooding since March to present (22 May 2022). The Office of Transport and Traffic Policy and Planning reported all related activities including the helping of people, the supporting of instrument of related agencies, the staff provision, the damages occurred to the cabinet. Then, the MOT directed the MOT Permanent-Secretary Office to report the preparation and the helping of the people every week.

4. The National Consultation Workshop for the Disaster Risk Reduction Focal Point: DRR Focal Point)

The Safety Planning Bureau participated in the National Consultation Workshop for the Disaster Risk Reduction Focal Point: DRR Focal Point and prepared related information and comments from DRR Focal Point in order to prepare for the Voluntary National Report: VNR. The bureau sent the information to the Disaster Prevention and Mitigation Department for consideration and interviewing.

The VNR of Thailand is the Midterm Review following the Sendai Framework. The DDPM will integrate the information and send the draft of the report for comments to the related agencies before the provision of the final summary report.

Greenhouse Gas Emissions reduction in the Transport Sector

Thailand has submitted the Nationally Appropriate Mitigation Actions (NAMAs), which sets forth goals to reduce Greenhouse Gas (GHG) emissions from energy and transport sectors by 7-20% against business as usual (BAU) level by 2020. The Ministry of Transport has therefore assigned the Office of Transport and Traffic Policy and Planning (OTP) to evaluate the GHG emissions reduction from two measures as 1) Shift mode activity from fossil fuel use vehicles to Mass Rapid Transit system and 2) The Optimization of flight performance, the details are as follows:

1. Mass Rapid Transit Projects: OTP tracked GHG emissions reduction from shifting the traditional travel models that use fossil fuel to Mass Rapid Transit System (BTS Green Line, MRT Blue Line, Purple Line, and Airport Rail Link) on the routes that operated in the evaluation year.

2. The Optimization of flight performance: OTP tracked GHG emissions reduction from domestic flights of Thai Airways International Public Co,.ltd, by improving or modifying the flight system to be more efficient for decreasing the use of fuel in the plane in the evaluation year.





Note:

1. **Tracked from BTS Green Line** (Sukhumvit Line: Mo Chit - Bearing and Silom Line: National Stadium - Bang Wa), MRT Blue Line (Hua Lamphong - Bang Sue) and Airport Rail Link (Phayathai - Suvarnabhumi).

2. **Tracked from BTS Green Line** (Sukhumvit Line: Mo Chit - Bearing and Silom Line: National Stadium - Bang Wa), MRT Blue Line (Hua Lamphong - Bang Sue), Purple Line (Khlong Bang Phai - Bang Sue (not include Tao Poon - Bang Sue section because the construction of their connecting platform had not been finished)) and Airport Rail Link (Phayathai - Suvarnabhumi).

3. **Tracked from BTS Green Line** (Sukhumvit Line: Mo Chit - Bearing and Silom Line: National Stadium - Bang Wa), MRT Blue Line (Hua Lamphong - Bang Sue), Purple Line (Khlong Bang Phai - Bang Sue (not include Tao Poon - Bang Sue section because the construction of their connecting platform had not been finished)) and Airport Rail Link (Phayathai - Suvarnabhumi).

4. **Tracked from BTS Green Line** (Sukhumvit Line: Mo Chit - Bearing and Silom Line: National Stadium - Bang Wa), MRT Blue Line (Hua Lamphong - Bang Sue and Bang Sue - Tao Poon), Purple Line (Khlong Bang Phai - Tao Poon) and Airport Rail Link (Phayathai - Suvarnabhumi).

5. **Tracked from BTS Green Line** (Mo Chit - Samut Prakan and National Stadium - Bang Wa), MRT Blue Line (Hua Lamphong - Bang Sue and Bang Sue - Tao Poon), Purple Line (Khlong Bang Phai - Tao Poon) and Airport Rail Link (Phayathai - Suvarnabhumi).

6. **Tracked from BTS Green Line** (Mo Chit - Samut Prakan and National Stadium - Bang Wa), MRT Blue Line (Hua Lamphong - Bang Sue, Bang Sue - Tha Phra and Hua Lamphong - Bang Khae), Purple Line (Khlong Bang Phai - Tao Poon) and not track Airport Rail Link section (Phayathai - Suvarnabhumi) because the change of the supervisory agency from S.R.T Electrified Train Company Limited to Asia Era One Company Limited. Therefore, the data is not collected for use in the GHG reduction assessment. Prof. 2020.



Pushing for the development of the Common Ticketing System in accordance with the policy of the Ministry of Transport

The Government has an urgent policy need to improve people's lives and reduce their cost of living by managing the transport system through the use of digital technology. In response to this policy need, the Ministry of Transport is implementing measures to improve the quality of public services through digital technology by pushing for the implementation of the Common Ticketing System and a Common Fare across the transport system. This is aimed at "**increasing the convenience of transfer between transport modes by using a single ticket to travel on all transit systems in a reasonable fare structure**". In turn, this is intended to promote and encourage people to change their travel behaviour towards the use of the public transport system, rather than private vehicles, thus, increasing the efficiency of transport services, improving people's quality of life, reducing traffic congestion problems, travel times, fuel consumption and vehicle emissions, such as greenhouse gases and particulate matters. In addition, it is also aimed at promoting the digital economy and benefitting society in a positive manner, in accordance with government policies.

The key success factors for the development of the Common Ticketing System are dependent upon Transport and Financial Technologies, the Common Ticketing System Management Act, B.E., and the Common Ticketing System Supporting Fund, which require co-operation between the government and the operators in order to achieve continuous integration. The Office of Transport and Traffic Policy and Planning (OTP) has, therefore, been

pushing for the development of the Common Ticketing System, in accordance with the policy of the Ministry of Transport, with the objective to employ an Account-Based Ticketing (ABT) System, including cEMV cards, for fare payment in the transit sector and future payments in the non-transit sector.

As part of the development of the ABT system, cEMV cards, which is part of the ABT system, are already in use on the transport system, and the submission of the Draft Common Ticketing System Management Act, B.E. °. has also been expedited.

1. The use of cEMV (Contactless Europay Mastercard and Visa) cards in the transport system cEMV cards are currently being applied as a Common Ticket on some transport system modes by allowing the use of credit or debit cards, with contactless technology, for fare payment by tapping the card on a card reader. This enables a passenger to reduce the ticket purchasing time, as well as allowing the service providers to reduce cash management costs. Currently, cEMV cards can be used for fare payment on the following transport system modes:

1.1 Mass Rapid Transit Systems

(1) The Mass Rapid Transit Authority of Thailand: the MRT Chaloem Ratchamongkhon line (Blue line) and the MRT Chalong Ratchadham line (Purple line), and

(2) The State Railway of Thailand: the SRT Red Line Mass Transit System, the Thani Ratthaya Line and the Nakhon Withi Line

1.2 Bus Transit Systems

(1) Bangkok Mass Transit Authority (BMTA)

(2) Thai Smile Bus Co., Ltd.

1.3 MINE Smart Ferry by E Smart Transport Co., Ltd.

1.4 Expressway Systems

(1) The Expressway Authority of Thailand: consists of 5 expressways, namely, Si Rat-Outer Ring Road Expressway, Udon Ratthaya Expressway, Si Rat Expressway, Kanchanaphisek Expressway and Chaloem Maha Nakhon Expressway

(2) The Department of Highways: consists of 1 expressway, namely, Uttaraphimuk Elevated Tollway (Don Muang Tollway)

2. Expediting the Submission of the Draft Common Ticketing System Management Act, B.E. ....,

The promulgation of Regulations of the Office of the Prime Minister on the Management of the Common Ticketing System B.E. 2563 is currently effective. However, the Regulations of the Office of the Prime Minister have a subordinate legislation status, applicable only to the central, provincial and local government, and cannot enforce the private sector to take any action; whereas the transport services in Thailand today rely on both public and private sectors.



Therefore, to achieve the level of integration required for the Common Ticketing System, all transit systems are required to rely on mechanisms of the law set at the primary level. OTP has, therefore, prepared a Draft Common Ticketing System Management Act, B.E. ...., to be complete and consistent with the current situation and to effectively support operations, in terms of the Common Fare and technology standards for the Common Ticketing System, which will be overseen by the Committee on Common Ticketing Policy (CCTSP). This committee will be a policy level agency (Policy Maker) that has the authority to define policy for the management of the Common Ticketing System, to prescribe guidelines and operation periods, issue regulations and other matters necessary to achieve the true integration of the Common Ticketing System. Also, the Act defines the Regulator as the agency for governing the management of the Common Ticketing System. In addition, the Common Ticketing System Management Act, B.E. ...., will define the establishment of the "Common Ticketing System Supporting Fund", to help support the implementation, development, promotion and management of the Common Ticketing System. The fund will also support and subsidise people who use the Common Ticketing System, so that they can use the transport systems with convenience and at reasonable cost. This will help reduce passenger travel costs, provide sustainably, and alleviate restrictions included in the original concession contracts.

OTP has currently submitted this draft Act to the Sub-Committee on Common Ticketing System Management Act, B.E. ..., which has the Deputy Permanent Secretary of the Ministry of Transport (Chief of Highway Infrastructure Development) as chairman, before proposing it to the Committee on Common Ticketing Policy (CCTSP), which has the Minister of the Ministry of Transport as chairman. Finally, it will be submitted to the Cabinet and the Office of the Council of State for consideration, before being published in the Government Gazette.



Feasibility Study, Conceptual Design, Environmental Impact Assessment and Business Development Model Analysis for Transport Infrastructure Development under Southern Economic Corridor Development for Transport Connectivity between the Gulf of Thailand and the Andaman Sea Project (Landbridge Project),

The Bureau of Regional Transport and Traffic System Promotion has the authority and duties to undertake study, analysis, and preparation of regional transport and traffic master plans to be consistent with the national economic and social development plans and the transport and traffic master plans, to monitor and evaluate performance in accordance with the plans, and to study and analyse regional transport and traffic plans and projects. The Bureau also gives recommendations on guidelines and measures for integrated prevention and solutions to regional transport and traffic problems, as well as coordinates and provides technical support and assistance to the Subcommittee on Provincial Land Transport System Management. The Bureau promotes the operations of related agencies in the region, and works in cooperation with other relevant agencies. Furthermore, the Bureau has the mission to support the Ministry of Transport's strategies and the Government's policies for regiones development. In 2022, the Bureau has undertaken Feasibility Study, Conceptual Design, Environmental Impact Assessment and Business Development Model Analysis for Transport Infrastructure Development under Southern Economic Corridor Development for Transport Connectivity between the Gulf of Thailand and the Andaman Sea Project (Landbridge Project), with the project period from 2 March 2021 to 1 September 2023.

Nearly 90 percent of international trade relies on maritime transport because of the world geography, with oceans covering three-fourths of the earth's surface, and the international maritime connectivity of all regions of the world. Maritime transport can carry large quantities of cargoes, with freight rates lower than other modes of transport. Consequently, maritime transport is a factor influencing competitiveness in the global trade and a vital component of international trade system.

In the Southeast Asian Region, the Strait of Malacca is a route connecting the Andaman Sea and Indian Ocean to the South China Sea and Pacific Ocean. Therefore, it is a major shipping route and one of the world's busiest routes as it is the shortest route connecting the trade and transport between countries in the Indian Ocean and Pacific Ocean. Several important ports are located along this route, namely Port of Singapore, and Malaysian ports: Port of Tanjung Pelepas, Port Klang, and Pulau Penang Port. The Port of Singapore handles the world's second largest container transport volume, with the containerized cargo volume in 2021 amounting to 37.5 MTEUs. It is the world's number-one transshipment port. The 2017 density of vessel traffic in the Strait of Malacca is about 85,000 vessels per year or 250 vessels per day on average, with an upward trend of 2.35 percent per year or about 100,000 vessels in the current year. The expansion of global trade contributes to an increasing trend of cargo vessels traversing the Strait of Malacca. It is anticipated that this may lead to traffic congestion in the Strait of Malacca in the future.

The Office of Transport and Traffic Policy and Planning (OTP) has, therefore, undertaken this study with the following objectives.

1) To carry out a feasibility study encompassing economic, financial, engineering, and social aspects;

2) To carry out conceptual design and environmental impact assessment;

3) To prepare a report on the project study and analysis in accordance with the Public - Private Partnership Act B.E. 2562 (2019); and

4) To analyze and formulate a business development model.

Rationale and necessity of the development of Landbridge Project are as follows:

1) Strategic Advantage of Thailand's Geographical Location: Located in the center of the Southeast Asian Region, Thailand is a gateway for cargo transport and exchanges of the countries in the region including South China and also a channel for intercontinental cargo exchanges.

2) Strategic Advantage of the Project Location: Landbridge Project will help reduce transport time and distance, resulting in transport cost reduction, and also avoid congestion problems in the Strait of Malacca. There is a trend towards attracting transport operators and investors to increasingly utilize this route

3) Strategic Advantage of Cargo and Oil Transport in the Region: The oil volume flowing through the Strait of Malacca is 15-18 percent of the global oil transport. The transport density in the Strait of Malacca provides an opportunity for the project development so that Thailand will become the hub of oil and natural gas transport in the future.

With the development of Landbridge Project, Thailand has the potential for the followings.

1) Trade Gateway for Thailand's Import-Export and a gateway for cargo transport and exchanges of the countries in the region such as ASEAN, BIMSTEC, South China, for exports to the Middle East and European countries.

2) Transshipment Port as an alternative for transshipments between the Indian Ocean and the Pacific Ocean, with rail and road linkage through Chumphon Port in the Gulf of Thailand and Ranong Port in the Andaman Sea.

3) Oil Bridge as an alternative for oil transportation. Oil will be shipped from the Strait of Hormuz to Ranong Port and then transported by pipeline to Chumphon Port for distribution in the region such as ASEAN, BIMSTEC, including some parts of China.

4) Port Hinterland Development by Free Zone Development and Investment Promotion to attract investors so as to enhance the potential for economic competitions in the southern region.

To achieve sustainable project development, the following strategies are crucial.

1) To promote and develop transport and logistics competitiveness in terms of transport costs and time and consider the possibilities for shipping lines to utilize the project.

2) To promote and facilitate businesses related to maritime transport such as bunkering services, ship maintenance, insurance, etc.

3) To develop hinterland industries and domestic industries, comprising promotion of industries in accordance with Thailand's policies, industries with potential for Landbridge promotion, and new industries.

4) Investment promotion and privilege policies such as establishment of policies on incentives for the use of Landbridge and tax reduction measures.

The preliminary study results indicate that the key compositions of Landbridge Project which need to be synchronously developed are as follows:

1) Development of 2 deep sea ports, one in the Gulf of Thailand and one on the Andaman coast. The port will be designed as an automated port to reduce time and increase cargo transfer efficiency.

2) Connectivity between the two ports will be realized via intercity motorway, railway, and pipeline transportation. The connecting route will be designed to reduce transport time, construction cost, and acquisition cost.

3) Hinterland development will be undertaken to support cargo distribution centers, cargo handling equipment and facilities, oil tank farms, and assembly facilities on both sea ports.

4) Promotion of land use in the Southern Economic Corridor by commercial area development such as office buildings, commercial buildings, and hotels, etc.

5) Development of residential areas such as houses, condominiums and apartments for rent, light industries such as auto parts assembly, food, and logistics activities including development of service industries in the area such as restaurants, hospitals, entertainment establishments, and shops, so as to create a town on the Landbridge route to be a center for trade and new industries of Thailand.

Selection of Port Sites: The selection criteria for port site selection were applied in accordance with standard port guidelines related to the PIANC Report, nr. 185 (2019), and UNCTAD (1984). The feasibility of port sites was assessed and scored in 4 aspects, i.e. engineering, investment, environmental, and social aspects. Weights of factors were considered by environmental intentional and cost intentional methods. The results show that the most feasible sites for the construction of Ranong and Chumphon deep sea ports are as follows:

1) Andaman Coast: Laem Ao Ang located in Ratchakrut subdistrict, Mueang Ranong district, Ranong province, which is close to the deepest channel, with Ko Phayam as a natural shelter. Erosion in the area is low and there is a low risk of tsunami storm surge. The port has accommodating cargo volume of 40 MTEUs.

2) Gulf of Thailand Coast: Laem Rio located in Bang Nam Chued subdistrict, Lang Suan district, Chumphon province. It is close to the deep channel and not adjacent to any conservation area. There is a slight risk of storm surge, and coastal erosion is low. In addition, the port can accommodate cargo volume of 40 MTEUs.

Cargo transport from Laem Rio port to Laem Ao Ang port will be of 89.35 kilometers, comprising intercity motorway, railway, pipeline transportation and service roads. The route alignment includes at grade and elevated sections as well as tunnels. The project route will pass 9 subdistricts in 3 districts, namely (1) Bang Nam Chued, Na Kha, Wang Tako and Had Yai subdistricts of Lang Suan district, Chumphon province; (2) Pang Wan, Phra Rak, Phato and Pak Song subdistricts of Phato district, Chumphon province; and (3) Ratchakrut subdistrict, Mueang Ranong district, Ranong province.

The components of route alignment comprise (1) 6-lane intercity motorway, (2) 4-track railway, comprising 2 standard-gauge railway tracks and 2 meter-gauge railway tracks designed to accommodate double deck trains, (3) service roads on both sides in urban areas and (4) pipeline. The ports will be designed to be modern and automated ports with low environmental impact.

Where the project route passes mountainous areas, a tunnel will be constructed, with separate tunnels for road and railway. Community connectivity is well designed, using ramp and elevated structures.

The project's public relations process is in place to continually promote project awareness and understanding among government agencies, private sector, and local people as follows:

1) Meetings were held with the Provincial Committee and heads of provincial government agencies, heads of district government agencies, subdistrict headmen and village headmen, including village meetings and meetings for project introduction to local people. The project public relations campaigns were conducted in 178 villages, 30 subdistricts and 5 districts in Ranong province; 204 villages in Chumphon province as well as Lang Suan and Phato districts. Furthermore, public relations campaigns were carried out through district-level meetings in 6 districts to extensively and continuously create project awareness and understanding.

2) Seminars were organized to introduce the project and obtain opinions from relevant government agencies, private sector and local people in 3 areas, i.e. the Gulf of Thailand coast on 8 December 2021 at Morakot Twin Hotel, Chumphon province; the Andaman coast on 9 December 2021 at Rachawadi Room, Heritage Grand Convention, Ranong province; and Bangkok on 21 December 2021 at Anantara Siam Bangkok Hotel in Bangkok.

3) Focus group meetings were held to receive and exchange opinions with the concerned agencies, entrepreneurs/operators or stakeholders in the port sites on the Gulf of Thailand and Andaman coasts as well as the areas along the project route in Ranong and Chumphon provinces during 6-11 June 2022. Eight forums were held, namely Forum 1: Bang Nam Chued, Na Kha and Na Phaya subdistricts of Lang Suan district, Chumphon province; Forum 2: Pang Wan, Had Yai, Wang Tako, and Phra Rak subdistricts of Phato district, Chumphon province; Forum 3: Phato subdistrict, Phato district, Chumphon province; Forum 4: Ratchakrut subdistrict, Mueang Ranong district, Ranong province; Forum 5: Pak Song subdistrict, Phato district, Chumphon province; Forum 6: Moo 2, Ko Phayam subdistrict, Mueang Ranong district, Ranong province; Forum 7: Moo 1, Ko Phayam subdistrict, Mueang Ranong district, Ranong province; and Forum 8: Muang Kluang subdistrict, Kapoe district, Ranong province.



Study of Suitable Technology Model Development for Traffic Management in Bangkok Metropolitan Area

The Land Traffic Management Division is the government agency established within the Office of Transport and Traffic Policy and Planning (OTP). The mission has the authority under the Ministerial Regulation on the Organization of the OTP, Ministry of Transport (MOT), B.E. 2552 (B.C. 2009) to study, survey, plan to organize road traffic. Suggestion policies and standards relating to the traffic system management as well as measures to tackle road traffic accord with urban development and the environment. Analyze and scrutinize the suitability of plans and projects relating to the traffic system of technic, economic, environment and urban planning of programs and projects. Suggestion guidelines, policies, measures, programs and projects of road traffic system management, including coordination, monitoring and evaluation operations.

In addition, The Land Traffic Management Division also responsible for the implementation of the Act of Commission for the Management of Land Traffic (CMLT) and other relevant laws according to the Act of CMLT, B.E. 2521 (B.C. 1978) 2nd Amendment B.E. 2535 (B.C. 1992). Which has the authority to study and analyze the land traffic condition. To formulate the master plan, to propose policy guidelines and set the standard solutions of traffic problems for CMLT to consider. Including, propose opinions related to improve and rectify in the road traffic laws or related laws that affect the road traffic system management to fitthe situation. As well as the considering to formulate training and educational programs and disseminating knowledge about the road traffic system management. The conduct ofthe CMLT meeting is important in the policy level, it is a mechanism to push the country's important policies, plans, projects into concrete implementation.

Study of Suitable Technology Model Development for Traffic Management in Bangkok Metropolitan Area

Project Background:

Study of Suitable Technology Model Development for Traffic Management in Bangkok Metropolitan Area is the project initiated in compliance with Prime Minister Prayuth Chan-ocha's strategy to solve the traffic congestion in urban areas. On March 30, 2020, the meeting No. 1/2563 was held with a resolution passed by the Committee for the Management of Land Traffic (CMLT) regarding the guidelines on traffic and transport technology system development for resolving the traffic problems in Bangkok and its vicinity. In this connection, a collaboration is expected from the relevant authorities to provide both information and traffic monitoring devices so that the traffic management efficiency can be improved. This is in relevant to the Minister of Transport's instruction to apply modern technologies on traffic resolution efforts.

Nowadays, many entities have successfully and effectively adopted traffic and transport technologies on an analysis of the traffic volume and travel speed of the areas required, in the automated continuous data form. These include the Close Circuit Television (CCTV) systems of Bangkok Metropolitan Administration, Department of Highways and Expressway Authority of Thailand; the GPS trackers installed on high-capacity buses, the Department of Land Transport's and Bangkok Mass Transit Authority's trucks; etc. Anyway, due to the data connection among entities are incomplete, it makes traffic management still lackness of efficiency in the overall. Study of Suitable Technology Model Development for Traffic Management in Bangkok Metropolitan Area has the principal objectives are not only to integrate the data derived from different entities' CCTV and GPS systems, but also to develop the data analytics system so that the data obtained can be analyzed, leading to a conclusion on important traffic and transport related information , namely the traffic volumes on alignments and at intersections, queue lengths, average speeds and the traffic density; all of which are the primary data required for the Bangkok traffic and transport problems resolution approach.

Project Objectives

1. To apply the data obtained from different entities' CCTV and GPS systems for taking advantage on traffic management;

2. To have a systematic and efficient form of data connection among agencies;

3. To have a central database that can be used for processing through the Cloud System and can be connected to the OTP database system;

4. To have a central database to support traffic management and to have practical applications in the suitable areas.

Expected Outcomes

1. An availability of the guidelines for enhancing the efficiency of CCTV system and GPS systems of relevant agencies in order to have form of data connection among agencies;

2. An availability of the application programs and data processing systems for enhancing the efficiency of CCTV and GPS systems;

3. An availability of the central database to facilitate traffic management, which may be applied wherever required.

Project Implementation Approach and Procedures

1. A Review on the Technologies Adopted Overseas for Data Collection, Analysis and Traffic Management with Good Practice Guidelines. Gather information about the technologies adopted overseas for data collection, analysis and traffic management with good practice guidelines. Initially, this will be carried out for the intelligent transport and traffic systems applied in many of the world's leading countries, i.e. USA, England, China and Japan, including Malaysia, where the nature of traffic is similar to that of Thailand.

2. A Review on the Technologies Adopted by the Relevant Authorities in Thailand for Data Collection, Analysis and Traffic Management. A detailed study and information gathering regarding the CCTV and GPS systems used by different entities in Bangkok by coordinating with the authorities concerned, including Bangkok Metropolitan Administration, Department of Highways, Department of Rural Roads, Expressway Authority of Thailand, Department of Land Transport and Bangkok Mass Transit Authority.

3 System Architecture Design - This is step for designing the components of traffic data analysis system from CCTV and GPS and the connection of various components in the system are as follows:

- Data Transfer System
- Data Preparation: Cleansing, Imputation and Transformation
- CCTV- and GPS-based Data Processing System
- CCTV- and GPS-based Traffic Data Analytics System
- Database System
- User Interface and Dashboard Display Systems

4. Data Transfer System Development - The purpose of this step is to import data of CCTV and GPS from the relevant authorities, for task in this section, it will consider of CCTV and GPS system of each authority to find the guidelines and develop Data Transfer System so that OTP can receive information from CCTV and GPS systems from the relevant authorities both online and automatically.

5. Data Preparation: Cleansing, Imputation and Transformation - This is step for bringing information from CCTV and GPS systems of various authorities to be used in processing and analyzing traffic information. It is necessary to prepare the information obtained from CCTV and GPS system to be in a suitable condition and ready to use first. In preparing the input data, it consists of 3 main parts as follows:

- Data Cleansing - This is to cut off the error data from the system and leave only the data that is usable.
- Data Imputation - This is to fill up the missing data by referring to the availablity data obtained from an analysis. This is to fill up the missing data by using the existing data from the analysis results to replace the missing data.
- Data Transformation - This is the formatting of data to suit the usage of the system.

6. Data Processing Applications Development - This can be divided into 2 main parts as follows:

- Development of CCTV image data processing system to convert CCTV image data into traffic data such as traffic volume, average speed and density, etc.
- Development of GPS data processing system by converting GPS data from taxicab into relevant traffic data such as average travel speed, etc.

7. Development of Traffic Data Analytics system from CCTV and GPS data. - This system will import the data obtained from both the CCTV-Based and GPS-Based Data Processing Systems and have them analyzed side-by-side, for example, in case the same type of traffic data is produced by both sources, cross-check the data with each other; complement each system by filling up the missing portion with the data obtained from the other; and make a conclusion on the alignment- and intersection-based traffic data, including the traffic volume, average speed, queue length and density.

8. Database System Development - This is divided into 2 parts as follows:

- A temporary database system for CCTV- and GPS-based data storage - This will be developed to temporarily store the CCTV- and GPS-based data received before they are transferred to the Data Processing and Traffic Data Analytics Systems. After such data have been analyzed and interpreted into traffic data, they will all be removed from the system.
- A database system for processed traffic data storage - This will be developed in a GIS-based form, to enable the analyzed traffic data to be stored according to the geographical locations of the alignments and intersections in Bangkok.

9. Development of User Interface and Dashboard Display Systems - The Web-Based User Interface System will be developed and classified into several user priority levels, with the interactive displays that allow users to query based on search conditions, such as locations of the alignments and intersections, traffic volumes, alignment average speeds, etc.



Guidelines for transport network development and accessibilities to mass transit stations and airports in Bangkok Metropolitan Region

Division of Transport and Traffic System Development has a main role to study and propose a model for route development, transport and traffic networks, and guidelines for the development of public transport systems connecting many forms in Bangkok Metropolitan Region. Also, The division has many study results, e.g. transport network development and accessibilities to mass transit stations and airports in Bangkok Metropolitan Region report, the Assessment of transport network development and accessibilities to mass transit stations and airports in Bangkok Metropolitan Region Report, feeder routes concept study to improve connectivity at metro stations, Siriraj station's Transit - Oriented Development Concept, The concept for increasing Intermodal transport connectivity at Don Mueang airport and Suvarnabhumi airport, and facilities development - connecting - access to 8 major metro stations according to the Mass Rapid Transit Master Plan for Bangkok Metropolitan Region (M-MAP). Moreover, the guidelines for transport network development are as follows:

1. Implement of transport network development and accessibilities to mass transit stations and airports in Bangkok Metropolitan Region

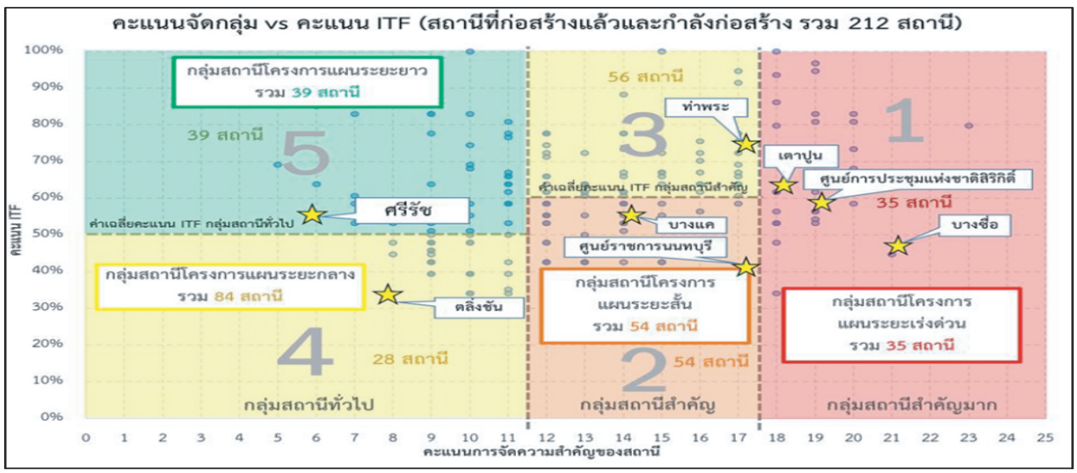
1.1 Physical survey and public transport access patterns

Division of Transport and Traffic System Development visited the area to survey physical structure, Intermodal transfer facility (ITF), the route and other modes of transportation connectivity within a radius of 500 meters and land use surrounding train stations within a radius of 500 meters.



1.2 Grouping of train stations importance which is form various factors and improvement of intermodal transfer facility (ITF)

Division of Transport and Traffic System Development has determined various factors consisting of 1) The number of station users per day in 2037 2) Connectivity to other major transportation systems within a radius of 500 meters 3) Population density factor 4) Land Use Factors (Comprehensive Town Plan) and 5) Factor in the number of landmarks within a radius of 500 meters. After that, the survey results on physical characteristics and public transport access patterns of 212 train stations that were built and under construction were used to determine the evaluation and improvement of intermodal transfer facility (ITF) and grouping of train station importance.



1.3 Organizing meetings / Seminar with other related agencies and public relations

Division of Transport and Traffic System Development has organized meetings / seminars with other related agencies that consist of MRTA, SRT, AOT, BMA, Nonthaburi Province Samut Prakan Province and Pathum Thani Province to receive comments and feedback which is beneficial to improve the study results. Also, the Division publicizes the study results once a month via https://www.accessfeeders.com/ infographics and OTP facebook to publish results and create correct awareness and understanding to the public.



2. Results

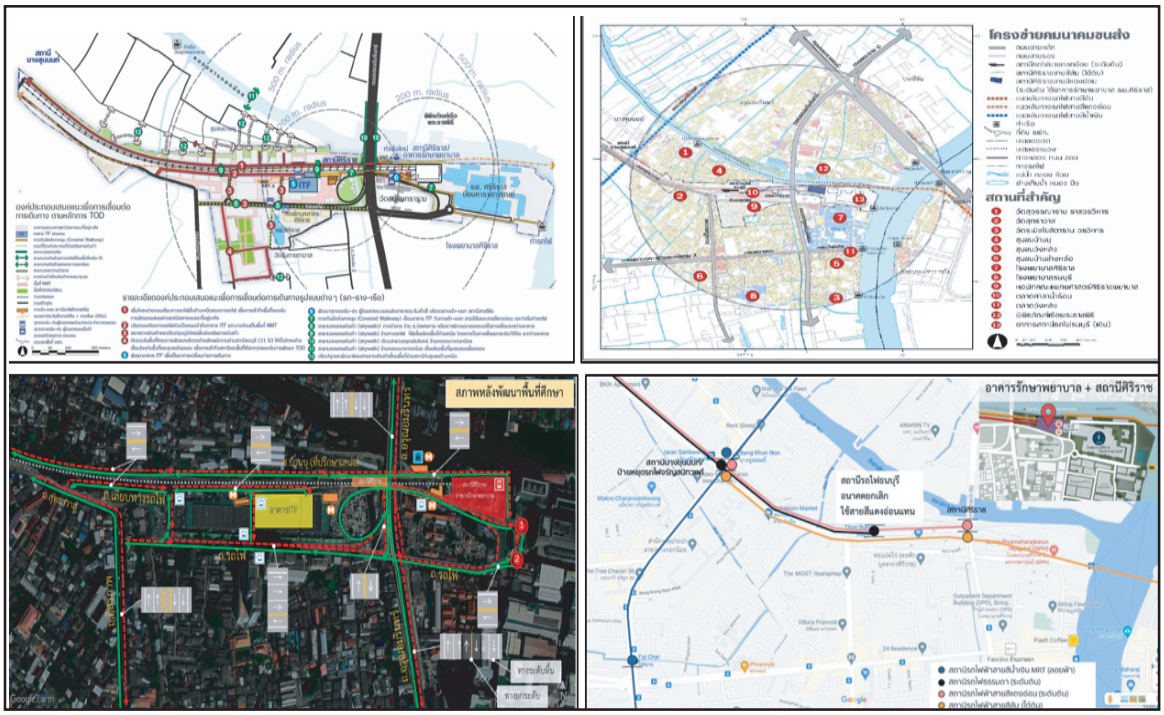
2.1 Transport network development and accessibilities to mass transit stations and airports in Bangkok Metropolitan

2.2 The assessment of transport network development and accessibilities to mass transit stations and airports in Bangkok Metropolitan

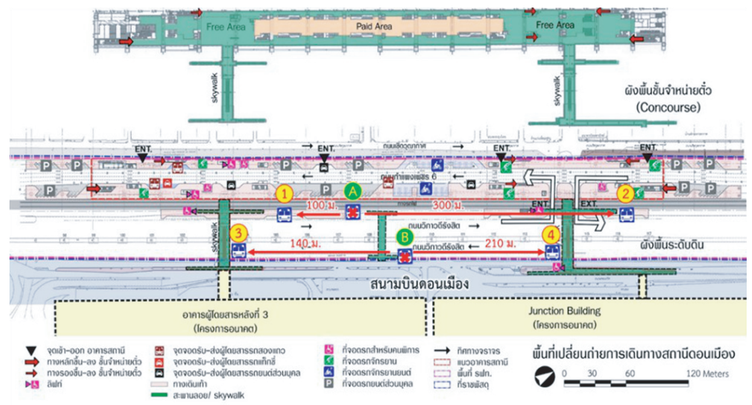
2.3 Feeder routes concept study to improve connectivity at metro stations encourage people to access public transportation in Bangkok Metropolitan Region and encourage them to travel by public transport instead of using personal cars. 81 feeder routes that have the least overlap of the current routes with multiple travel connections have 2 route patterns 1) Schedule Fixed Route could carry a large number of passengers with a fixed schedule and routes. 2) On demand routes are flexibility in service time and able to travel quickly. Feeder routes detail consist of routes distance, travel time, number of passengers/person/day ,the frequency of vehicle service category 1 and 4, passenger volume forecast etc.

2.4 Siriraj Station's Transit-Oriented Development Concept is the development of the area surrounding the Station according to the principle and TOD component as follows: 1) The ITF building is provided to support for transfer by public transport 2) adjust the original road line along the southern railroad track to be a road for cars to access ITF building and other buildings

separated from the pedestrian area 3) provide a transfer area that focuses on Non-Motorized Transit to encourage walking, cycling and using public transport 4) cut the road to connect southern side, Soi Itsaraphap 46, Soi Wanglang 2, and pedestrian walkway connecting Soi Wang Lang. 5) Improve the layout to have a commercial mixed-use building next to the train road 6) Extend the pavement surface and provide elements and activities that promote walking 7) Developed into a mixed commercial and residential building and a hotel as well as as well as providing public open spaces that the surrounding communities can access and use



2.5 The Concept for Increasing Intermodal Transport Connectivity at Don Mueang Airport and Suvarnabhumi Airport to increase the ability to access the air transport system and support the journey of passengers who use the airport service. Division of Transport and Traffic System Development has suggestions to facilitate people with luggage handicap, disabled persons and people of all groups. The ramp design with landings in the ratio of 1:12 at the connection between Don Mueang Station and Don Mueang Airport. There is a move and addition of a public bus stop on Vibhavadi Rangsit Road In order to increase the access performance to electric trains and Don Mueang Airport. Also, The concept of connecting travel to Suvarnabhumi Airport will add BMTA bus stop at the first floor passenger terminal at the airport arrival-departure area Level 1 Gate 8 with Changi Airport Singaporeand Narita Airport Japan





2.6 Facilities Development - Connecting - Access to 8 Major Metro Stations According to the Mass Rapid Transit Master Plan for Bangkok Metropolitan Region (M-MAP) Division of Transport and Traffic System Development selected 381 electric train stations according to the Mass Rapid Transit Master Plan for Bangkok Metropolitan Region (M-MAP) to study the preliminary design. There are 8 prototype stations consist of 3 stations E.g. 3 high priority stations (Tao Poon Station, Queen Sirikit National Convention Centre Station, and Bang Sue Station) 3 Priority stations (Tha Phra Station, Bang Khae Station, Nonthaburi Civic Center Station) 2 general station (Si Rat Station and Taling Chan Station). Also, The preliminary design consist of station-related overview information, network connection to electric train stations, guidelines for area improvement with network connection to the stations, guidelines for area improvement with the ITF rating of each station, landscape improvements around the stations and preliminary price estimation, and preliminary construction cost estimation.

2.7 Application Mobile (BKKTransit.net) to be a tool to facilitate people to plan and make decisions on traveling by other forms of public transport in Bangkok Metropolitan Region

3. Operational plan in the future

Division of Transport and Traffic System Development has a plan to drive 6 study results which are as follows: 1) Transport network development and accessibilities to mass transit stations and airports in Bangkok Metropolitan Region report 2) The Assessment of transport network development and accessibilities to mass transit stations and airports in Bangkok Metropolitan Region Report 3) Feeder routes concept study to improve connectivity at metro stations 4) Siriraj Station's Transit-Oriented Development Concept 5) The Concept for Increasing Intermodal Transport Connectivity at Don Mueang Airport and Suvarnabhumi Airport and 6) Facilities Development - Connecting - Access to 8 Major Metro Stations According to the Mass Rapid Transit Master Plan for Bangkok Metropolitan Region (M-MAP)) into effective practice and achieve the target objectives. Also, the division will present to the Ministry of Transport and the Commission for Management of land Traffic (CMLT) to be informed accordingly and consider assigning various agencies put the study results into practice

Role, Ruty, Mission Public transport and facilities

1. Study and suggest guidelines for the development and management of public transport systems and Facilities in all modes of transport infrastructure that are appropriate in line with national development and sustainable transport guidelines.

2. Study and suggest the arrangement of facilities for all ages including people with disabilities and the elderly in every infrastructure of public transport.

3. Study and recommend the investment model of public transport and the provision of facilities in the infrastructure of all public transport systems.

4. Coordinate operations to ensure compliance with established policies and measures.

5. Working with or supporting the operations of other agencies involved or assigned

Urban Development and Transport Oriented Development (TOD)

Urban Development and Transportation Infrastructure System (TOD) promotes the development of cities surrounding mass transit stations by taking advantage of convenient accessibility. Support the population and economy of the city with the development of commercial areas, work sites, housing, and other land-use activities in a variety of areas around the station Promote travel by public transport, especially rail and non-motorized travel. (Non-Motorized Mode) as a system to connect to a variety of travel It is a highly efficient system. low power consumption Reduces transportation costs and is environmentally friendly Help to eliminate the problem of urban development without direction (Urban Sprawl) following economic, social, and environmental growth in balance and sustainability.

The main idea of TOD development is to use the potential of convenient public transportation to develop compact cities. environmentally friendly by promoting high-density hybrid development The distance from the station is about 400 - 650 meters with full public services. able to live for various activities within the area easily by walking or riding a bike or using public transport to travel in cases outside of walking distance This will reduce the use of personal cars. Therefore, it is a compact urban development model. environmentally friendly and people have a good quality of life

The development of the TOD area consists of four main components: 1) Mixed-Use and Density for commercial and residential purposes 2) Linkages; Secondary transport (Feeder) and facilities. 3) Facilities (Amenities) for residents and users of the area. green areas, utilities, and public utilities; and 4) Transition changes that reduce the use of motorized vehicles (Non-Motorized Transit: NMT) promote walking. cycling and reducing the use of cars There is an area for transit (Station Plaza) connecting the main station with the secondary mass transit system, etc.,

TOD development 3 model cities, namely Pattaya Station, Chon Buri Province, Khon Kaen Station, Khon Kaen Province, and Ayutthaya Station Phra Nakhon Si Ayutthaya Province To be a model city for the development of TOD to other areas, have the potential and suitability for conducting studies and suggesting specific plans and designing the details of the area development (Urban Design Development) according to TOD principles, which This is a preliminary action to framing. Guidelines for the development of the area surrounding the railway station to have the full potential of land use. There are important elements following the TOD principles to facilitate travel for the local population and the growing number of tourists in the future.

Benefits: Shift Mode allows the country's main travel to be the rail system, providing a cost-effective investment. draw people to access the rail transport system Develop the area around the station to prevent urban and environmental problems. and can generate commercial income to support the rail transport system and fares

Operation status: OTP is in the process of finalizing the study results. as well as consulting with relevant agencies in the 3 model city areas to receive opinions, suggestions, and guidelines for driving in the model city areas. Before presenting the Ministry of Transport and the Commission for the Management of Road Traffic, acknowledge the results of the study in converting to the next steps.



Bangkok Travel Demand Survey

1. Study Area

The Bangkok Travel Demand Survey Project defines a study area to cover 5,320 square kilometers of Bangkok and its vicinity, which consists of Bangkok, Samutprakan, Nonthaburi, Pathunthani, Nakhonpathom, and Samutsakhon. In addition, this project is considered to be able to utilize transport mode for future extended railway, Red line, which has been place to cover Nakhonpathom Phranakhonsiayutthaya and Chachoengsao. So, the total study area of this project is approximately 6,630 squares kilometer, presented in Figure 1.

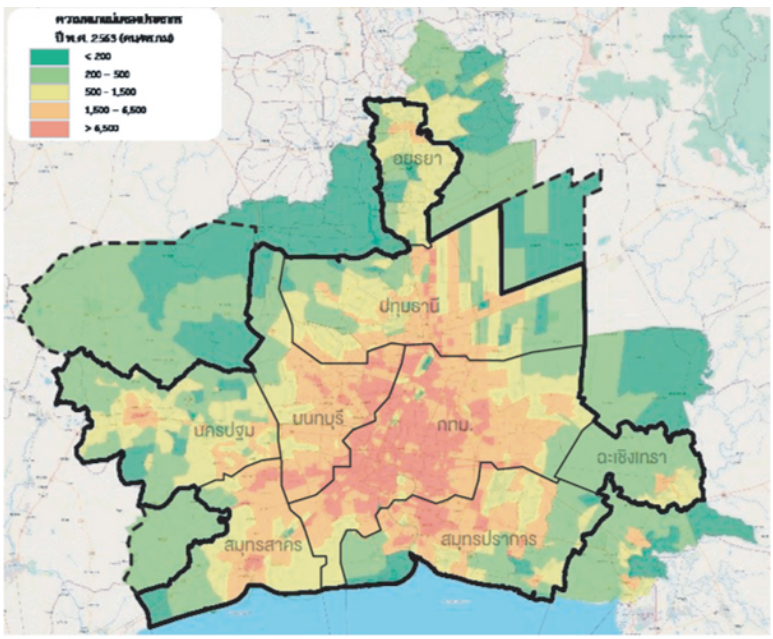


Figure 1 Study Area

2. The Survey and Data Analysis for Person Trip Survey of Bangkok Metropolitan Region

2.1 Surveys Methodology

2.1.1 Destination Interview Survey

Destination interview survey is designated to collect the result through a mobile application. The result will be stored on could computing system for further analysis.

2.1.2 Home Interview Survey

Household survey is designed and then randomly collected from people who live in houses, commercial buildings, condominiums and dormitories. The web-based application is also developed to collect the result for storing on cloud computing system for further analysis.

2.1.3 Web Application System Development

Web Application is designed for acquiring travel demand survey online. The answers will be stored and analyzed for the next step. The web application is presented in Figure 2.

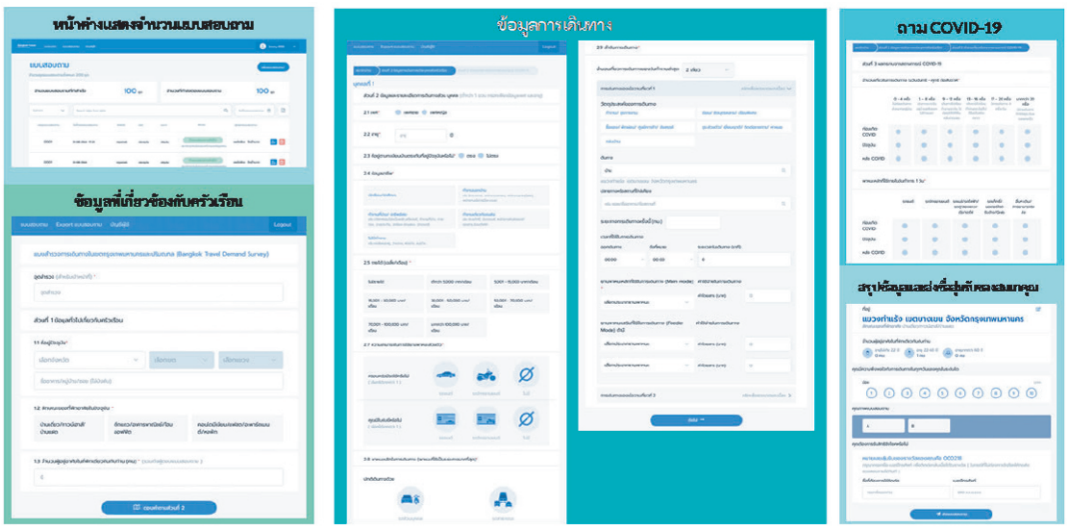


Figure 2 Web Application

2.2 Distribution of Sampling

The sampling group of survey in this project is 74,704 households, which is 1.27% of total household in the study area. The survey was conducted from 1 November 2021 to 31 March 2022. The sampling distribution is shown in Table 1

province / Amphoe	household	objective (1% of household)	Survey	Percentage
Bangkok	3,103,483	31,035	39,711	128%
Nonthaburi	688,670	6,887	8,776	127%
Pathumthani	606,447	6,064	7,682	127%
Samutprakan	711,804	7,118	8,666	122%
Samutsakhon	263,992	2,640	3,275	124%
Nakhonpathom	317,942	3,179	4,089	129%
Chachoengsao	73,702	737	1,035	140%
Phranakhonsiayutthaya	117,503	1,175	1,470	125%
Total	**5,883,543**	**58,835**	**74,704**	**127%**

2.3 Study Result

From land use and urban development trend, the study area is categorized into 3 groups, which are central business district (CBD), urban and suburban, presented in Table 2. The data collection will be divided to analyze regards to the area segmentation. Table 2 Area Segmentation

area group	Khet/Amphoe
CBD	**Bangkok** : Phranakhon Dusit Bangrak Pathumwan Pomprapsattruphai Yannawa Samphanthawong Phayathai Thonburi Bangkokyai Huaikhwang Khlongsan Bangkoknoi Bangphlat Dindaeng Sathon Bangsue Chatuchack Bangkholaem Khlongtoei Ratchathewi and Watthana
Urban	**Bangkok** : Bangkhen Bangkapi Phrakhanong Minburi Latkrabang Talingchan Bangkhunthain Phasicharoen Nongkhaem Ratburana Buengkum Prawet Suanluang Chomthong Donmueang Latphrao Bangkhae Laksi Saimai Khannayao Saphansung Wangthonglang Khlongsamwa Bangna Thawiwatthana Thungkhru Bangbon **Samutprakan** : Mueangsamutprakan Bangphli Phrapradaeng Bangsaothong **Pathumthani** : Mueangpathumthani Thanyaburi Lamlukka Khlongluang **Nonthaburi** : Mueangnonthaburi Bangkruai Bangyai Bangbuathong Pakkret **Nakhonpathom** : Mueangnakhonpathom Phutthamonthon **Samutsakhon** : Mueangsamutsakhon Krathumbaen **Phranakhonsiayutthaya** : Phranakhonsiayutthaya **Chachoengsao** : Mueangchachoengsao
Suburban	**Bangkok** : Nongchok **Samutprakan** : Phrasamutchedi Bangbo **Pathumthani** : Samkhok Latlumkaeo **Nonthaburi** : Sainoi **Nakhonpathom** : Nakhonchaisi Samphran **Phranakhonsiayutthaya** : Bangpa-in

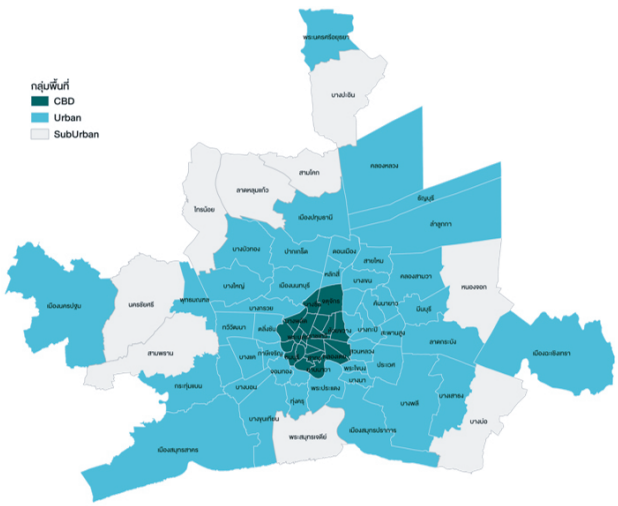


Figure 3 Segmentation of Data for Analysis

2.4 Study Results

The survey result highlights that the private car ownership in non-comprehensive public transportation such as Chachoengsao, Phranakhonsiayutthaya is higher than other areas because people need to have their own cars to facilitate their travel. The proportion of vehicles ownerships is shown in Figure 4.

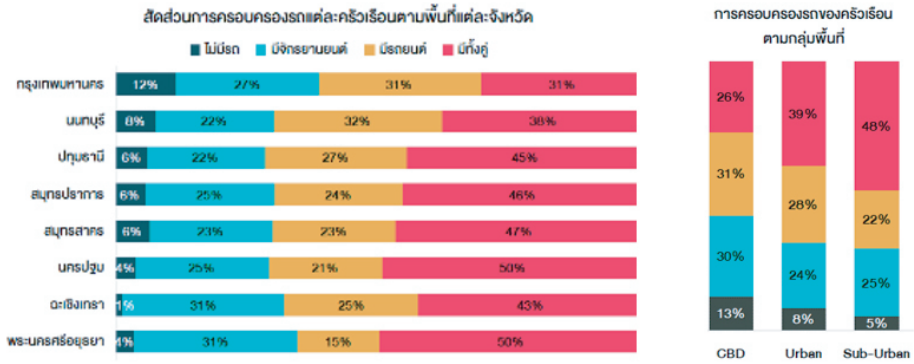


Figure 4 Vehicle Ownership of Household

Furthermore, in 2022, the average trip rate is 1.66 trip per day. It is 15% lower than the 2017 survey result. It was affected by COVID-19 pandemic. A disruption of COVID-19 has potential to cause behavioral change particularly working from home, studying online, ordering food, delivery and shopping online. Currently, the highest trip propose is to work, shop and hang out. People likely travel during rush hour in the morning time (7.00 a.m. - 8.00 a.m.) and the evening time (5 p.m. - 6 p.m.). The trips purpose and departure time presented in Figure 5 and Figure 6.

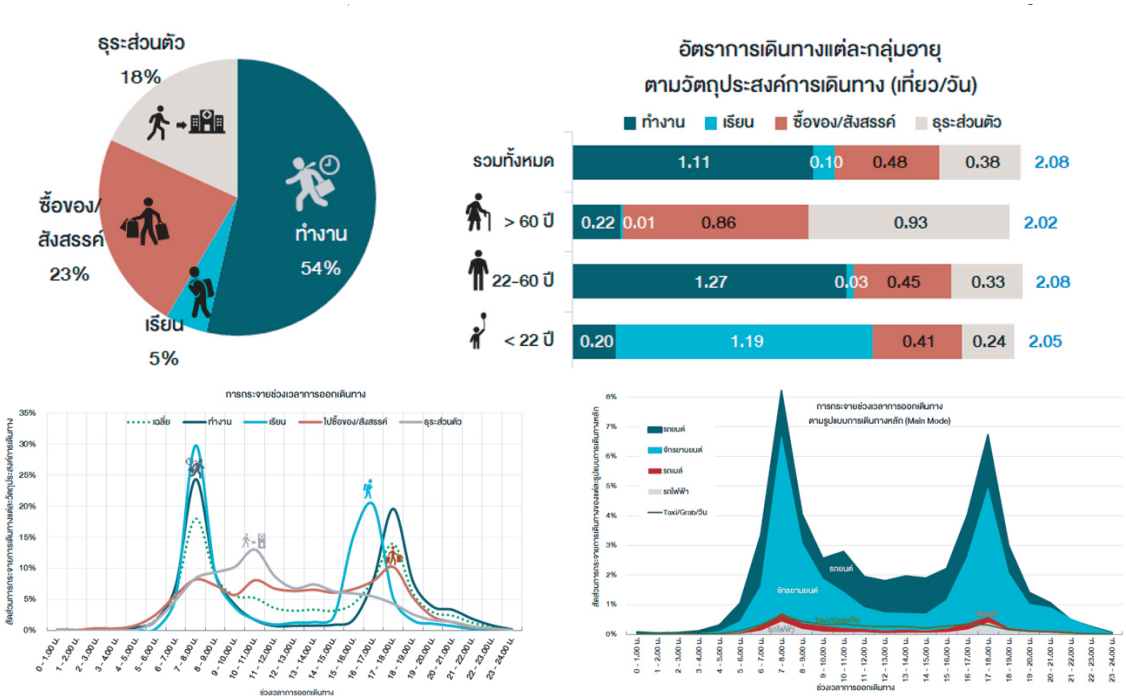


Figure 6 Departure Time

The study result also presents that in Bangkok, Nonthaburi and Samutprakan, the proportion of public transport usage is higher than other provinces as there are various availability of the public transport service such as buses, sky train, and passenger vans. On the other hand, travel by private vehicles in Nakhonpathom is the highest ratio when compare with other provinces. The analysis of the study found that the average trip time is 29 minute per trip with the average speed of travel at 26 km/hr. The average length is 12.2 km per trip and the average travel expense is 36 bath per trip. Bangkok has the highest trip rate. The Main Mode, The average length, The average speed of travel, The average trip time and the average travel expense presented in Figure 7 to Figure 11.

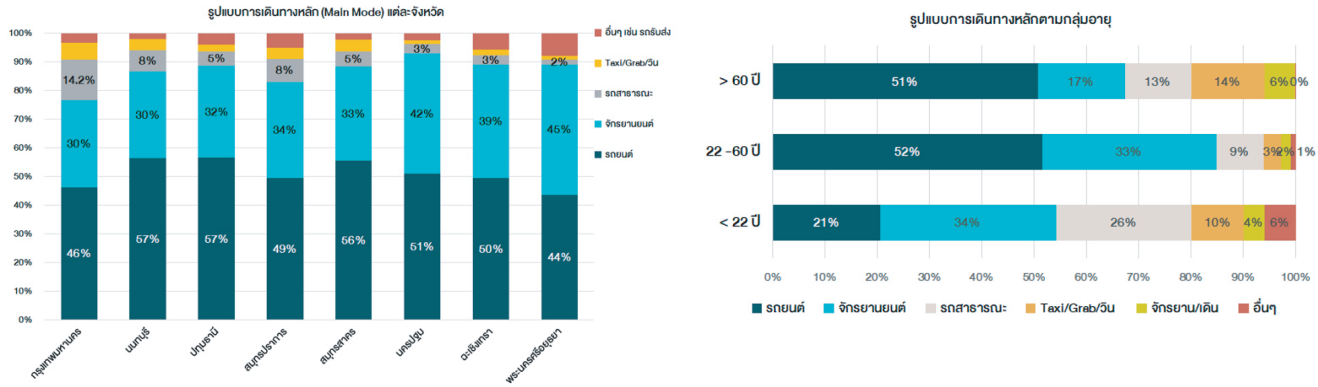


Figure 7 The Main Mode

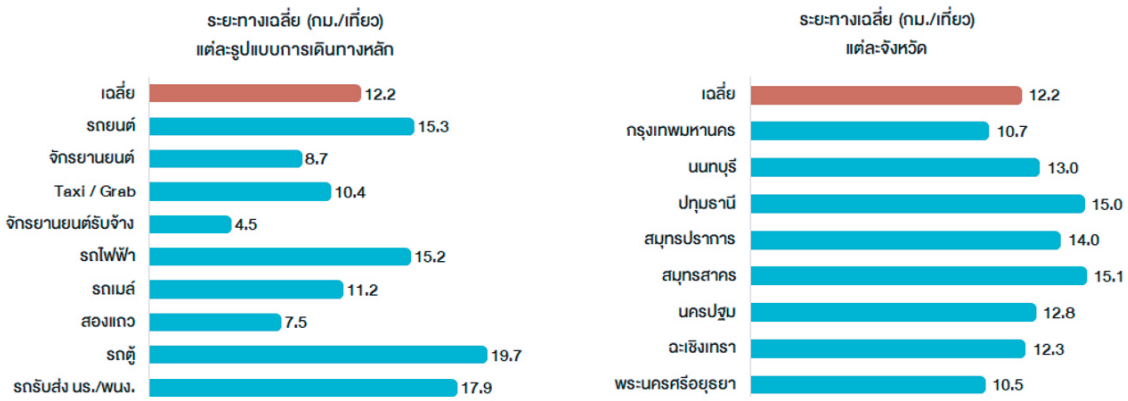


Figure 8 The Average Length

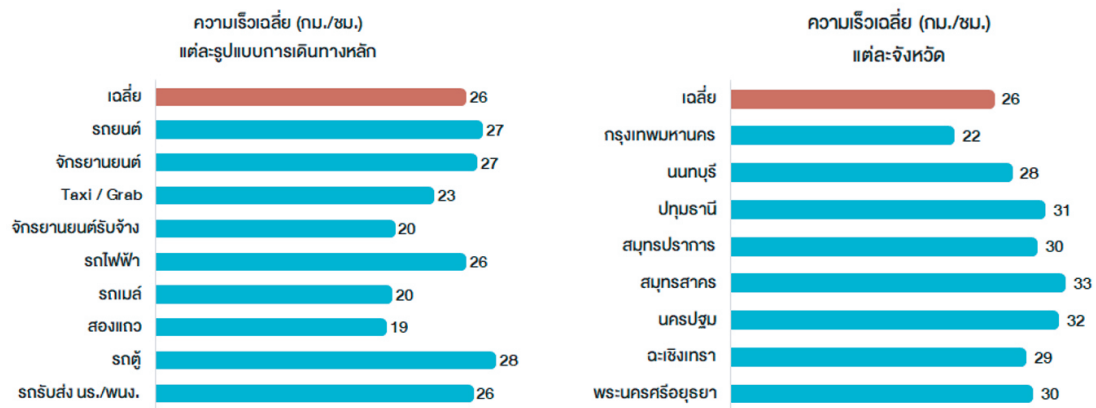


Figure 9 The Average Speed of Travel

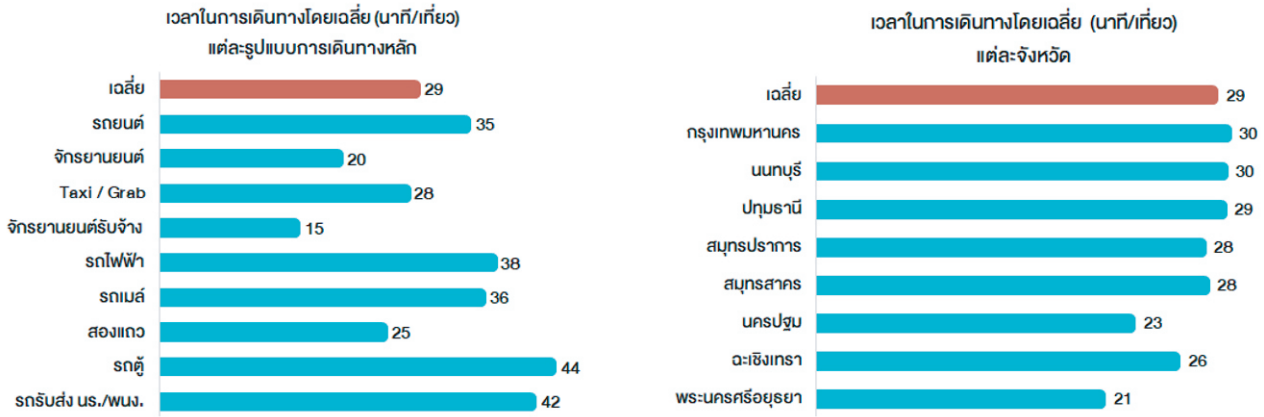


Figure 10 The Average Trip Time

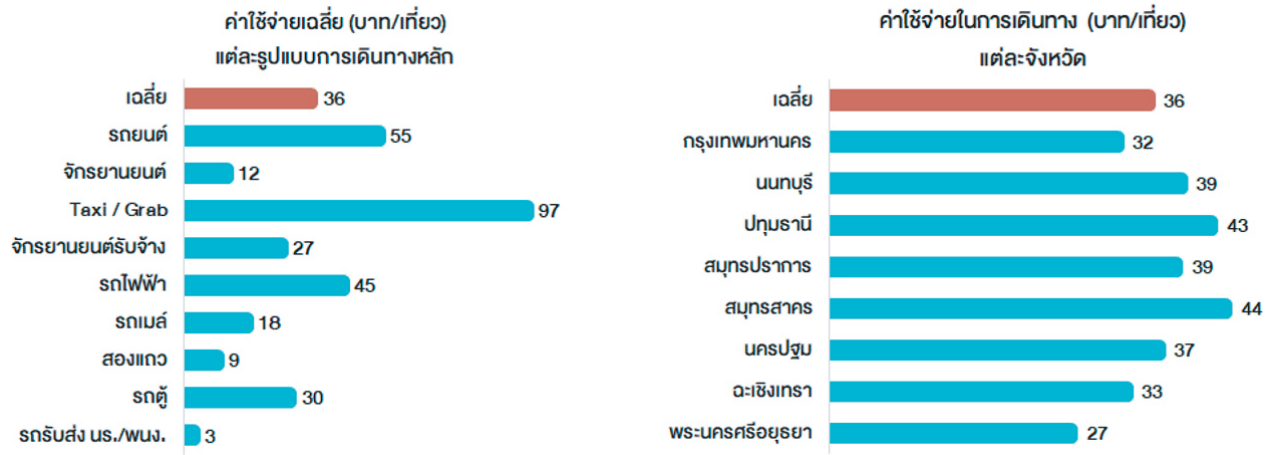
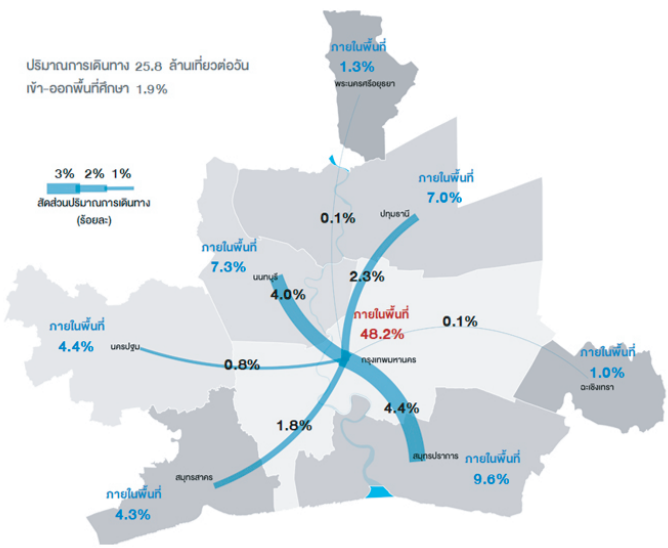


Figure 11 The Average Travel Expense

Moreover, in regard to the COVID-19 pandemic and new study area adjustment, the total travel capacity in year 2022 decreased 26% from year 2016. The travel capacity in 2016 was 32.65 million trip per day while the travel capacity in 2022 is 25.8 million trips per day. The travel capacity within the study area is 25.3 million trips per day (98.1%) and the internal-external travel capacity is 0.5 million trips per day (1.9%). This data presented in Figure 12.



	กรุงเทพมหานคร	นนทบุรี	ปทุมธานี	สมุทรปราการ	สมุทรสาคร	นครปฐม	พระนครศรีอยุธยา	ฉะเชิงเทรา	นอกพื้นที่ศึกษา
กรุงเทพมหานคร	48.2%	2.00%	1.15%	2.20%	0.91%	0.38%	0.03%	0.05%	0.18%
นนทบุรี	2.01%	7.3%	0.26%	0.03%	0.04%	0.06%	0.01%	0.00%	0.06%
ปทุมธานี	1.15%	0.26%	7.0%	0.03%	0.01%	0.01%	0.10%	0.00%	0.09%
สมุทรปราการ	2.21%	0.03%	0.03%	9.6%	0.03%	0.01%	0.00%	0.01%	0.14%
สมุทรสาคร	0.91%	0.04%	0.01%	0.03%	4.3%	0.22%	0.00%	0.00%	0.13%
นครปฐม	0.38%	0.06%	0.01%	0.01%	0.22%	4.4%	0.00%	0.00%	0.13%
พระนครศรีอยุธยา	0.03%	0.01%	0.10%	0.00%	0.00%	0.00%	1.3%	0.00%	0.13%
ฉะเชิงเทรา	0.05%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	1.0%	0.09%
นอกพื้นที่ศึกษา	0.16%	0.05%	0.09%	0.14%	0.13%	0.13%	0.13%	0.09%	0.0%

Figure 12 The Volume of Travel Trip in The Study Area

3. The Study and Data Analysis of Goods Transportation by Truck

3.1 Surveys Methodology

The survey of goods transportation by trucks was divided into 3 parts as follows.

1. The survey of internal-external goods travel of the study area
2. The survey of goods travel around the main logistics hubs
3. The survey of goods travel within the area (Transportation trip interview from entrepreneurs)

The survey was conducted by interview with operators through phone, face-to-face and online meeting and roadside survey.

3.2 Distribution of sampling

3.2.1 The Survey of Internal-External Goods Travel of The Study Area

The survey of internal-external goods travel of the study area was distributed at the weight stations. There are 10 weight stations consisting of Lat Bua Luang Weighing Station (Inbound), Bang Pa-In Weighing Station (Inbound), Wang Noi Weighing Station (outbound), Nong Chok Weighing Station (Inbound), Bangpakong Weighing Station (Inbound), Chonburi Weighing Station (Inbound) Bang Khru 1 Weighing Station, Samut Sakhon Weighing Station (Inbound), Samut Sakhon Weighing Station (Outbound) and Nakhon Chai Si Weighing Station (Outbound). There are minimum 400 survey at each station. So, the total sampling size is 4,708.

3.2.2 The Survey of Goods Travel Around The Main Logistics Hub

This project collected data from 6 main logistics hubs, which were Khlong Luang Commodity Transport Station, Phutthamonthon Commodity Transport Station, Rom Klao Commodity Transport Station, Lat Krabang Inland Container Depot, Bangkok Port and Talaad Thai, the total sampling size is 3,738

3.2.3 The Survey of Goods Travel for Within The Area (Transportation Trip Interview From Entrepreneurs)

The survey within the study area was collected by interviewing with entrepreneurs. The entrepreneurs is divided by land use into 5 groups, which are construction materials / agribusiness sector, manufacturing sector, wholesale and retail sector, transportation and warehousing sector and service sector. The total survey is 3,286.

3.3 Results

3.3.1 The Results of The Survey of Internal-External Goods Travel of The Study Area

According to the result analysis from survey of internal-external goods travel of the study area, it presented that there was total 225,625 trucks per day. The goods transportation in weekdays was 4,708 trucks, which was 2.1% of total goods transportation. Mostly trucks departed from eastern part of Thailand (33.05%), followed by Bangkok and its vicinity (29.84%), and central part of Thailand (24.53%) respectively. The most desirable destinations were Bangkok and its vicinity (50.87%), followed by western part of Thailand (13.62%) and the central part of Thailand (11.68%). The results of the survey of internal-external goods travel of the study area presented in Figure 13.

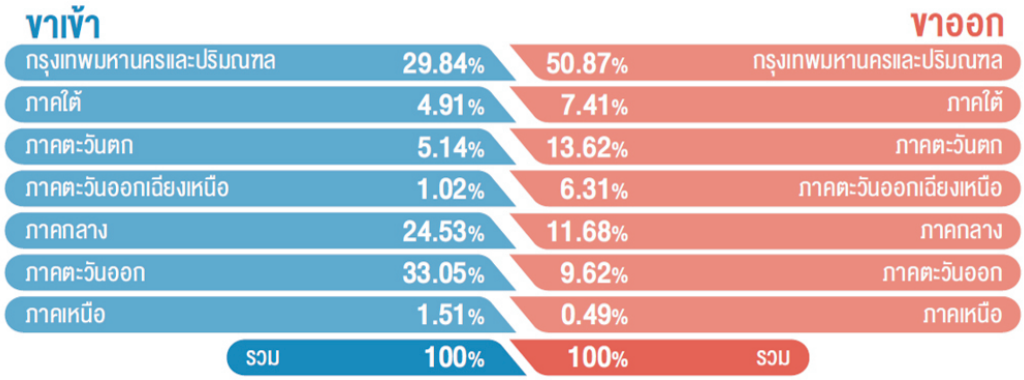


Figure 13 The Results of The Survey of Internal-External Goods Travel of The Study Area

3.3.2 The Results of The Survey of Travel Around The Main Transportation Hub

From the result of the survey at the 6 logistics hubs, it can be found that there is 23,07 vehicles per day and during weekdays there is 3,738 trips (vehicles), which represents 16.1% of total vehicles. Then, the weekdays survey indicates that the logistics hubs in Bangkok and its vicinity have the most goods transportation (46.10%) followed by eastern part of Thailand (24.25%) and central part of Thailand (13.26%), presented in Figure 14.

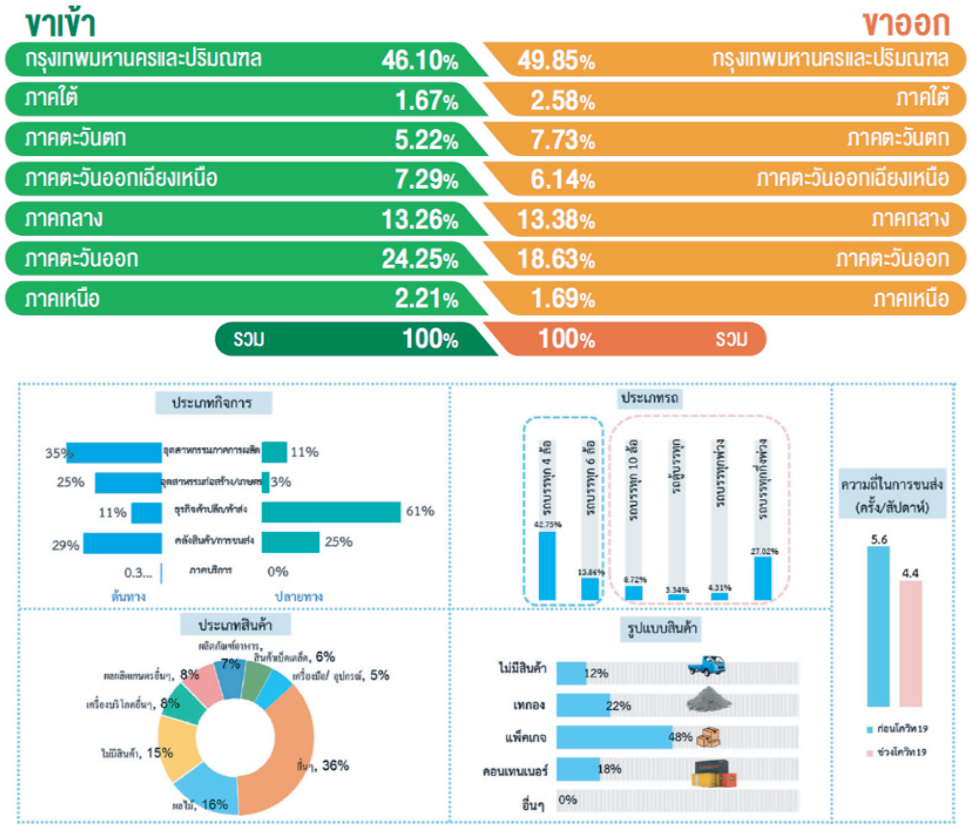


Figure 14 The Results of The Survey of Travel Around The Main Transportation Hub

3.3.3 The Results of The Survey of Transportation within The Area

The interview with entrepreneur results show that in Bangkok area, small trucks mainly travel during 6 a.m. - 6 p.m. while heavy trucks travel during 9 a.m. - midnight. For the outer part of Bangkok, both small and heavy trucks travel during 6 a.m. - 6 p.m. The time duration of goods transportation is presented in Figure 15.

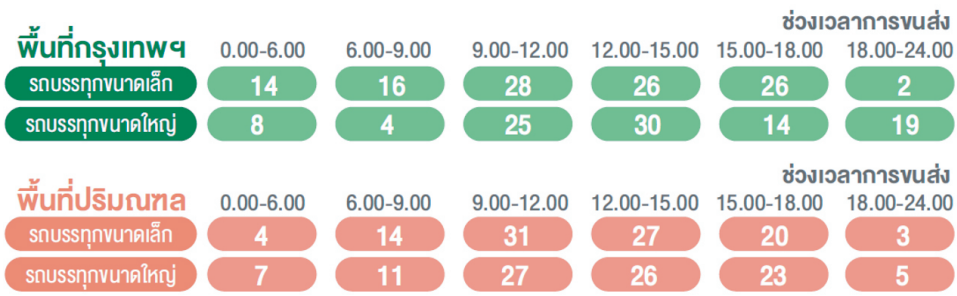


Figure 15 The Results of The Survey of Transportation within The Area

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