



Executive Summary Report

The Study of Thailand's Aviation Master Plan

Acknowledgement

Acknowledgement

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Table of Content

Table of Content

	Page
Acknowledgements	
1. Introduction	1
1.1 Rationale for Thai Aviation Development	1
1.2 Thai Aviation Development Planning Concept	2
2. 15-Year Thai Aviation Development Plan (2019-2033)	4
2.1 Fundamental Policy for the Aviation Development Plan	4
2.2 Vision, Overall Goal, and Missions of the Thai Aviation Development Plan	7
2.3 Development Frameworks under 15-Year Thai Aviation Development Plan (2019-2033)	10
2.4 KPIs for Thai Aviation Development	30
2.5 Planned Projects/Measures Under the 15-Year Thai Aviation Development Plan (2019-2033)	33
3. Policy Recommendations	34
3.1 Key Success Factors for implementation of the Plan	34
3.2 Policy Recommendations	35
Appendix A Planned Projects/Measures under the 15-Year Thai Aviation Development Plan (2019-2033)	39

List of Figure

	Page
Figure 1 Root Causes of the Obstacles to the Successful Development of Thai Aviation	1
Figure 2 Mechanism for Addressing the Current Situation and moving toward Future Goals	2
Figure 3 Development Frameworks and Linkages for Thai Aviation Development	3
Figure 4 Formulation of Development Frameworks and the Planning Process	3
Figure 5 Aviation Sector Restructuring in support of the Policy on Free and Fair Competition in the Aviation Business	4
Figure 6 Targeted Structure for the Aviation Sector as a Basis for the Thai Aviation Development Plan	5
Figure 7 Development Frameworks under the 15-Year Thai Aviation Development Plan (2019-2033)	9
Figure 8 Categorisation of Thai Airports in 2019, 2028, and 2033	13
Figure 9 Potential Airports in Thailand that may become MRO hubs for aircraft and aircraft parts (which should be studied in further detail)	19
Figure 10 Key Success Factors for the 15-Year Thai Aviation Development Plan (2019-2033)	34
Figure 11 Policy Recommendations	36

List of Table

	Page
Table 1 Framework Components and Strategies under Development Framework 1 - Airports Development	11
Table 2 Framework Components and Strategies under Development Framework 2 - Promoting Airlines and Supporting Businesses	17
Table 3 Framework Components and Strategies under Development Framework 3 - Development of Air Navigation Services	20
Table 4 Framework Components and Strategies under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations	23
Table 5 Framework Components and Strategies under Development Framework 5 - Aviation Human Resource Development	26
Table 6 Framework Components, Strategies and Goals for Thailand to Achieve 'Global Aviation Hub' Status	28
Table 7 Suggestion of Overall KPIs	30
Table 8 Significance of KPIs for Each Development Framework of Thai Aviation Development	31
Table 9 Total Investment Budget under the 5 Development Frameworks	33
Table 10 Key policy recommendations for explicit and continuous policy formulation on Thai Aviation Development	37
Table A-1 Planned Projects/Measures under Development Framework 1 - Airports Development	39
Table A-2 Planned Projects/Measures under Development Framework 2 - Promoting Airlines and Supporting Businesses	48
Table A-3 Planned Projects/Measures under Development Framework 3 - Development of Air Navigation Services	55
Table A-4 Planned Projects/Measures under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations	58
Table A-5 Planned Projects/Measures under Development Framework 5 - Aviation Human Resource Development	65

1.

Introduction

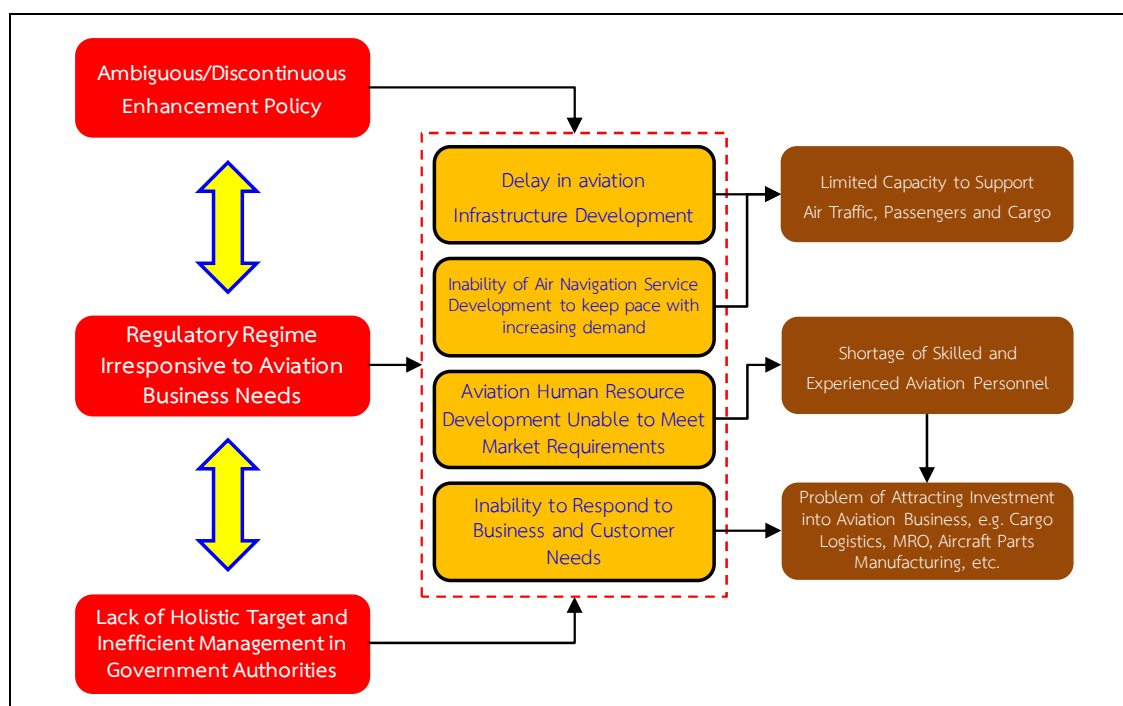
Executive Summary Report

1. Introduction

1.1 Rationale for Thai Aviation Development

Up until now, the Thai aviation sector has been unable to fully attract investment from both the domestic and overseas private sectors. This is due to an ambiguous development direction for the whole Thai aviation sector, discontinuous enhancement of related policies, laws, and regulations, and non-optimised aviation management efficiency and integrative operation of related public agencies. Coupled with ineffective production of aviation human resource, which is inadequately responsive to the business sector's and market demands, the development of air navigation infrastructure and service system has lagged behind, and being unable to keep up with the constant increase of air transport demand.

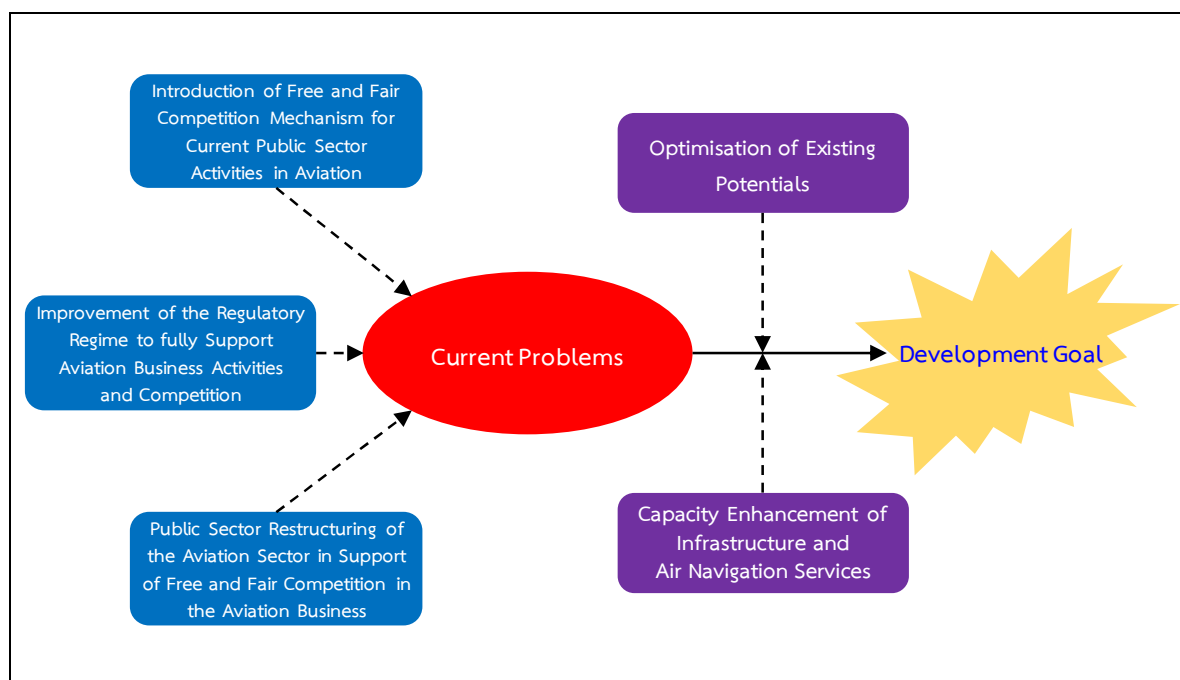
Potentiality of the whole Thai aviation sector has been affected by these problems, and is now inferior to that of other countries, who have laid out their plans for air transport capability enhancement, with an aim to become regional aviation hubs. As a result, Thailand has lost considerable market share and economic opportunities. The root causes of problems in the Thai aviation are shown in Figure 1.



Source: Consultant

Figure 1 Root Causes of the Obstacles to the Successful Development of Thai Aviation

Nevertheless, Thailand's potential as Asia-Pacific's major tourist destination, and its growing economy, as well as the country's high ranking in the FDI Confidence Index, still provides Thailand with an opportunity to achieve its long-term goal to develop a world class aviation business through pertinent problem solving, development of infrastructure and air navigation services, and efficient maximisation of the country's potentials (Figure 2).



Source: Consultant

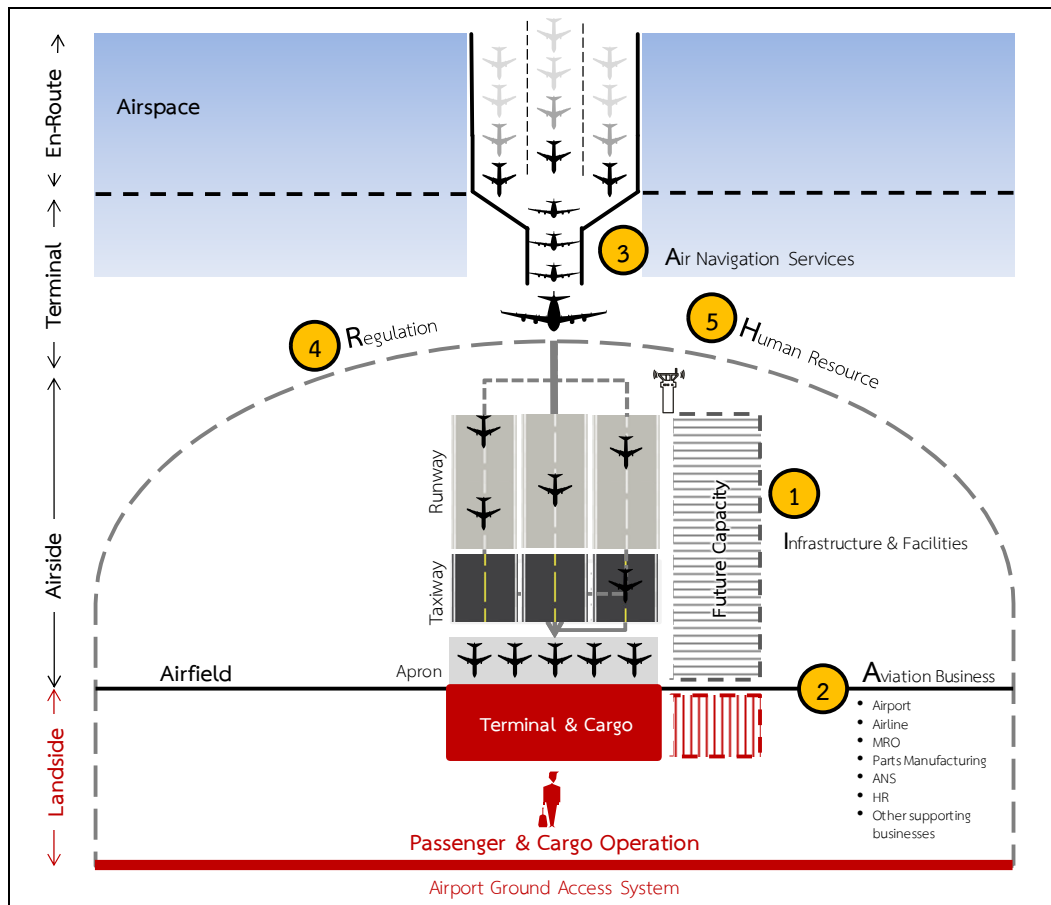
Figure 2 Mechanism for Addressing the Current Situation and moving toward Future Goals

1.2 Thai Aviation Development Planning Concept

In order to promote a clear development direction for Thai aviation and the operational integration of all concerned sectors in a bid to address the above problems, enhance airport competitiveness, develop the aviation business, and improve air navigation services to achieve targets and goals in a tangible manner, the Ministry of Transport therefore implemented “The Study of Thailand’s Aviation Master Plan”, of which the key outcome is the 15-Year Thai Aviation Development Plan (2019-2033)¹. The plan covers the following 5 Development Frameworks: (i) Development Framework 1 - Airports Development; (ii) Development Framework 2 - Promoting Airlines and Supporting Business; (iii) Development Framework 3 - Development of Air Navigation Services; (iv) Development Framework 4 - Development of the Regulatory Mechanism; and (v) Development Framework 5 - Aviation Human Resource Development. These frameworks and linkages are illustrated in Figure 3.

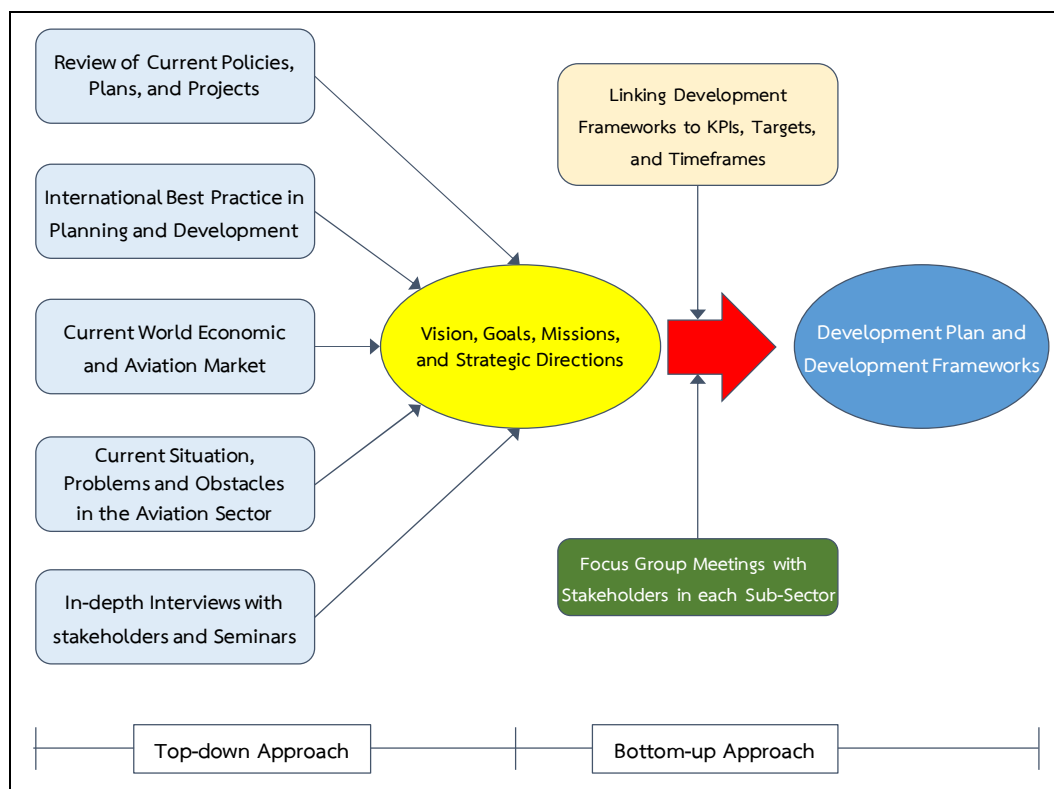
The development frameworks under the 15-Year Thai Aviation Development Plan (2019-2033) were established based on the results of TOWS analysis and in-depth interviews with the stakeholders in various fields of the aviation sector in order to formulate vision, goals, missions and strategic directions. Meanwhile, the process shown in Figure 4, balances top-down and bottom-up approaches, in order to ensure operational integration of all concerned sectors, when setting goals, developing frameworks, and addressing strategic issues related to the implementation of the 5 development frameworks. A SWOT analysis was then conducted to look into Strengths, Weaknesses, Opportunities, and Threats (SWOT) within each development framework.

¹ The cabinet resolution, dated 4 December 2017, has set out the hierarchy of plans of public agencies. The Office of Transport and Traffic Policy and Planning therefore changed the name of the outcome of this project from “Thailand’s Aviation Master Plan” to “15-Year Thai Aviation Development Plan (2019-2033)” in order to conform with this resolution.



Source: Consultant

Figure 3 Development Frameworks and Linkages for Thai Aviation Development



Source: Consultant

Figure 4 Formulation of Development Frameworks and the Planning Process

2.

15-Year Thai Aviation Development Plan (2019-2033)

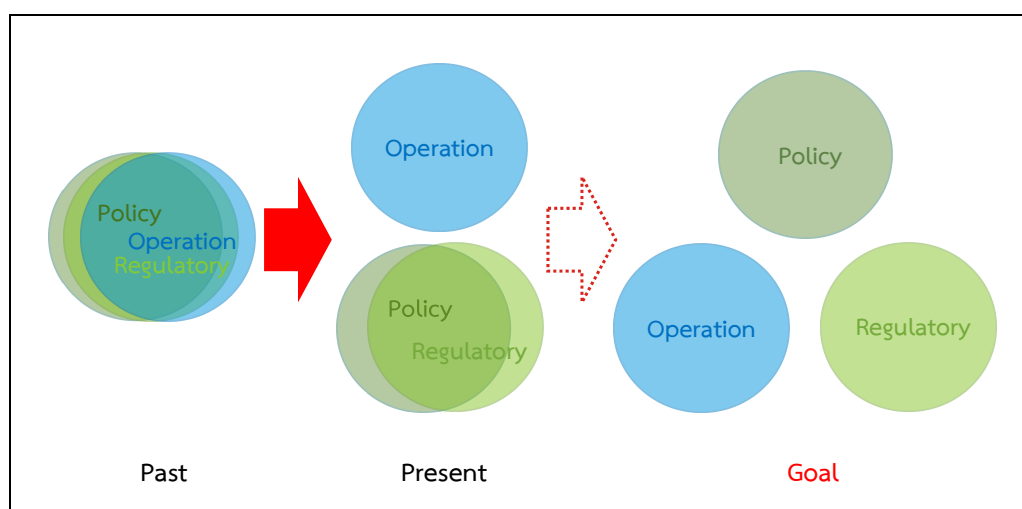
2. 15-Year Thai Aviation Development Plan (2019-2033)

The 15-Year Thai Aviation Development Plan (2019-2033) comprises 5 key components: (i) a fundamental policy for the Aviation Development plan, (ii) a vision, grand target and mission statement for the Thai Aviation Development Plan, (iii) development frameworks under the 15-year Thai Aviation Development Plan (2019-2033), (vi) KPIs for aviation development, and (v) plans for projects/measures under the 15-Year Thai Aviation Development Plan (2019-2033).

2.1 Fundamental Policy for the Aviation Development Plan

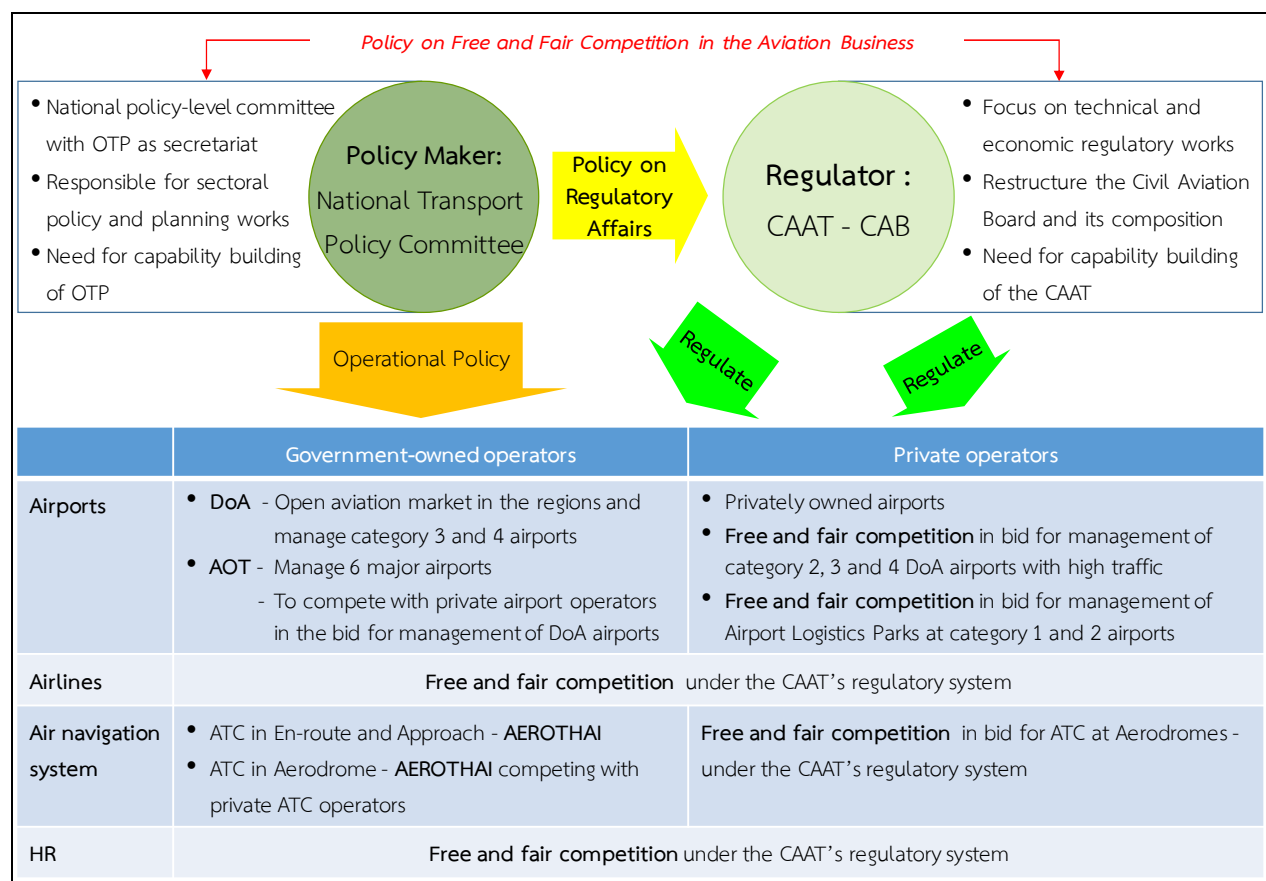
In formulating the 15-Year Thai Aviation Development Plan (2019-2033), which will be the implementation framework for all concerned public agencies, fundamental policy is crucial in determining the development frameworks, strategies, plans, projects, and measures that will mobilise the plan to achieve tangible results in order for Thailand to become a Global Aviation Hub in the Asia-Pacific region. The government will need to continuously adhere to the fundamental policy, at least throughout the implementation timeframe of the plan. The key fundamental policy that the government has to spell out and adhere to, is the Policy on Free and Fair Competition in the Aviation Business under the principle of “free and fair competition in all areas that will maximise operational efficiency for customers and deliver quality services at reasonable prices”. It is also important that the government must abide by this policy at least throughout the period of the Plan.

Under this policy, the overall picture of the aviation sector management mechanism needs to be improved and restructured for better transparency, in accordance with the principle of good governance. All concerned players, be it policy maker, regulator, and operator, will have to be clearly tasked and be independent from one another. This approach will be different from the existing structure, which has been the root cause of the country's aviation-related problems, as shown in Figure 5. The targeted and future structure is also shown in Figure 6.



Source: Consultant

Figure 5 Aviation Sector Restructuring in support of the Policy on Free and Fair Competition in the Aviation Business



Remark: (i) OTP (Office of Transport and Traffic Policy and Planning) (ii) CAB (Civil Aviation Board) (iii) CAAT (Civil Aviation Authority of Thailand)
(iv) DoA (Department of Airports) (v) AOT (Airports of Thailand PLC.) (vi) AEROTHAI (Aeronautical Radio of Thailand Ltd.)

Source: Consultant

**Figure 6 Targeted Structure for the Aviation Sector as a Basis
for the Thai Aviation Development Plan**

Under the targeted structure, all concerned sectors, be it public or private, including public organisations (e.g., Airports of Thailand PLC., etc.), should be independent from one another in terms of management and operation, but will be subject to a monitoring mechanism to ensure fair competition in services.

- 1) **Policy Maker:** It is important that the government be clear and transparent in the policy preparation of various aspects, especially public sector investment in air transport, policy formulation, and planning on cross-sectorial issues, as well as development planning. Under the existing structure, the agency responsible has not clearly been assigned, so the Ministry of Transport should set up a “National Transport Policy Committee” and upgrade the Office of Transport and Traffic Policy and Planning in order to undertake a secretarial role to accommodate the implementation of air transport policies.
- 2) **Regulator:** which monitors operational agencies, with regard to technical regulation (including safety and security), and also economic regulation, to ensure fair business competition on a par with international standards. In this case, it is necessary to revise related laws to enhance the efficiency of the Civil Aviation Authority of Thailand (CAAT) as the regulator that is independent from the political sector, both for technical and economic regulation (especially competition in various areas of the aviation business). The aviation regulatory agency may be set up in a similar manner as the Energy Regulatory Commission, or National Broadcasting and Telecommunication Commission.

- 3) **Operator:** that is, aviation businesses that should be supported for competitive services, whether it be competition-IN-the-market or competition-FOR-the-market. These businesses include airports, airlines, air navigation services, aircraft maintenance, aircraft parts manufacturing, aviation human resource development, etc.

The establishment of a “National Transport Policy Committee”, as a policy maker, is aimed to centralise responsibility and authority for recommendation of policies and plans for transport development in all sectors (land, waterway, air) to be under this Committee. The structure and authority of the Committee will be similar to that of the National Energy Policy Commission, as stipulated in the National Energy Policy Commission Act, B.E. 2535. The National Transport Policy Committee will have the duty to propose policies and administrative plans for the country's transport development to the cabinet.

With regard to a procedure for the establishment of the National Transport Policy Committee, a royal act may be drafted and proposed to the House of Representatives and the Senate, respectively, by the cabinet in accordance with the country's legislative process. The whole process may take at least 8 months.

Organisational structure of the National Transport Policy Committee should be set as follows: Prime Minister as chair, and assigned Deputy Prime Minister as vice chair, with the Minister of Transport, Minister of Finance, Director-General of the Budget Bureau, Secretary-General of the National Economic and Social Development Board, Permanent Secretary to Ministry of Finance, Permanent Secretary to Ministry of Transport, Permanent Secretary to Ministry of Information and Communications Technology, Permanent Secretary to Ministry of Energy, Permanent Secretary to Ministry of Commerce, Permanent Secretary to Ministry of Education, and Permanent Secretary to Ministry of Industry as members. The Director-General of Office of Transport and Traffic Policy and Planning (OTP) is to be a member and secretary of the Committee, while the OTP office should act as the Committee Secretariat to perform duties and missions according to the (draft) royal act.

The role and responsibilities of the National Transport Policy Committee should at least consist of:

- (1) Determining short-term and long-term integrative policies for the development of national transport, and proposing to the cabinet
- (2) Determining regulatory policies as an implementation framework for regulatory organisations (for air transport, the following should be included: (i) airways, (ii) fee collection of the regulatory organisation, (iii) economic regulations, (iv) technical regulations)
- (3) Integrating and approving investment plans, projects and the budget for the development of the national transport system
- (4) Monitoring concerned public agencies to ensure they operate according to the policies set by the National Transport Policy Committee, and evaluating their performance
- (5) Appointing ad-hoc committees, or sub-committees, for task implementation as assigned by the National Transport Policy Committee

It follows that OTP's responsibilities, as the secretariat of the National Transport Policy Committee, should also be revised to be consistent with the above roles of the Committee, as follows:

- (1) Compiling information, monitoring the transport situation, and analysing trends and impacts for the formulation of proposals for policies and plans for national transport development and management, and disclosing transport-related statistics
- (2) Studying and analysing policies and plans for the development and management of all modes of national transport, and proposing them to the National Transport Policy Committee
- (3) Following up, evaluating, and acting as liaison office for the implementation of policies and plans for national transport development and management
- (4) Other tasks as assigned by the cabinet or the National Transport Policy Committee

In addition, after the establishment of the National Transport Policy Committee, the Civil Aviation Board (CAB) should also be restructured to correspond with its role as an independent regulator. The CAB may consist of the Permanent Secretary to Ministry of Transport as chair, and another 7 selected members representing the Royal Thai Air Force and other qualified aviation experts, with the Director-General of the Civil Aviation Authority of Thailand (CAAT) as secretary. The responsibilities of the CAB shall include:

- (1) Setting guidelines, deliberating and approving facilitation, security, and safety plans for national civil aviation
- (2) Approving rules and regulations issued by the CAAT Director-General
- (3) Approving civil aviation fees and charges
- (4) Setting criteria and calculation of related fees
- (5) Setting conditions and rates for service fees, charges, or any other remunerations to be imposed at public-service airports
- (6) Setting conditions for collection and approval of fees for air navigation services to the public
- (7) Setting regulatory criteria to ensure free and fair competition

Restructuring of the aviation sector will engender clarity, transparency, and fairness of overall sector management, and will enhance the credibility of the country's aviation business, which should ultimately attract private investment and business, both domestic and from overseas, in a sustainable manner.

2.2 Vision, Overall Goal, and Missions of the Thai Aviation Development Plan

Vision:

“To be a World Class Hub for Aviation Business”

Remark: ‘Aviation Business’ include aviation services, and other supporting businesses, as well as maintenance of aircraft and aircraft parts, and aircraft parts manufacturing

Overall Goal:

“To be a world class hub for aviation business in the Asia-Pacific region, which includes being the region’s major destination and transfer hub, a hub for maintenance of aircraft and aircraft parts (MRO), an aircraft parts manufacturing base, and a centre for aviation human resource development”.

Missions:

- 1) To promote shared and unified development goals by improving the operational mechanisms of public agencies to ensure the maximum benefit to the nation's economy, taking into account national security and environmental issues.
- 2) To restructure public agencies in order to better serve the needs of the business sector under the framework for the free and fair competition policy in the aviation business.
- 3) To create a regulatory mechanism that exceeds global standards and inclusively covers the operation of all concerned sectors, based on the principles of good governance and free and fair competition.
- 4) To promote the private sector's role in the Thai aviation business development by creating an investor-friendly environment for aviation businesses.
- 5) To enhance the country's standard of aviation human resource development to be on a par with international standards in order to become an aviation human resource development hub in the Asia-Pacific region.
- 6) To develop aviation infrastructure and facilities towards a digital-based society

Timeframe:

The timeframe is set for 15 years (2019-2033), in line with the envisaged paradigm shift in the country's various sectors, and within the framework of the 20-Year National Strategy. It is divided into 2 phases (1st phase: 10 years, and 2nd: 10 to 15 years).

The plan consists of 5 Development Frameworks: (i) Development Framework 1 - Airports Development; (ii) Development Framework 2 - Promoting Airlines and Supporting Business; (iii) Development Framework 3 - Development of Air Navigation Services; (iv) Development Framework 4 - Development of the Regulatory Mechanism; and (v) Development Framework 5 - Aviation Human Resource Development. This is as shown in Figure 7:

Vision	“To be a World Class Hub for Aviation Business”				
Overall Goal	“To be a world class hub for aviation business in the Asia-Pacific region, which includes being the region’s major destination and transfer hub, a hub for maintenance of aircraft and aircraft parts (MRO), an aircraft parts manufacturing base, and a centre for aviation human resource development”				
Missions	1. To promote shared and unified development goals by improving the operational mechanisms of public agencies to ensure the maximum benefit to the nation’s economy, taking into account national security and environmental issues. 2. To restructure public agencies in order to better serve the needs of the business sector under the framework for the free and fair competition policy in the aviation business. 3. To create a regulatory mechanism that exceeds global standards and inclusively covers the operation of all concerned sectors, based on the principles of good governance and free and fair competition. 4. To promote the private sector’s role in the Thai aviation business development by creating an investor-friendly environment for aviation business. 5. To enhance the country’s standard of aviation human resource development to be on a par with international standards in order to become an aviation human resource development hub in the Asia-Pacific region. 6. To develop aviation infrastructure and facilities towards a digital-based society				
Development Framework 1 Airports Development		Development Framework 2 Promoting Airlines and Supporting Business	Development Framework 3 Development of Air Navigation Services	Development Framework 4 Development of the Regulatory Mechanism and Related Regulations	Development Framework 5 Aviation Human Resource Development
Framework Component 1.1 Capacity and utilisation enhancement of airports Framework Component 1.2 Promoting competition in airport management and airport related services Framework Component 1.3 Development of the transport systems connecting airports and surrounding urban areas Framework Component 1.4 Improving airport security standards Framework Component 1.5 Development of airports for general aviation activities		Framework Component 2.1 Promoting and facilitating airline business and its supporting businesses in Thailand Framework Component 2.2 Promoting value-added logistics activities for air cargo Framework Component 2.3 Promoting development of MRO businesses and aircraft parts manufacturing	Framework Component 3.1 Strengthening Thailand’s air navigation service capacity to accommodate ASBU and the Asia/Pacific Seamless ATM Plan	Framework Component 4.1 Defining a clear and practical regulatory policy Framework Component 4.2 Capacity building of the regulatory body Framework Component 4.3 Improvement of the legal framework in the aviation sector	Framework Component 5.1 Upgrading the aviation human resource development standards in order to be responsive to business needs Framework Component 5.2 Capacity building of current workforce in the aviation business

Source: Consultant

Figure 7 Development Frameworks under the 15-Year Thai Aviation Development Plan (2019-2033)

2.3 Development Frameworks under 15-Year Thai Aviation Development Plan (2019-2033)

Development Frameworks under the Thai Aviation Development Plan are based on a SWOT analysis and TOWS Matrix, which were synthesised from the country's aviation business environments, obstacles and challenges. The essence of the 15-Year Thai Aviation Development Plan (2019-2033) can be summarised as follows:

2.3.1 Development Framework 1 - Airports Development

The airport system is part of the air transport infrastructure network and is a major means of evaluating the air transport system capacity. According to the performance data of Thai airports, there has been an increase of passengers at Suvarnabhumi, Don Muang and regional airports, thanks to the tourism sector. However, major problems still remain, for example, flight congestion during peak hours, the multi-modal transport system, and internal management (such as minimum connecting times at Suvarnabhumi Airport, which is longer than at airports of nearby countries). Cargo transport demand is still lower than current capacity. However, use of existing resources has not been optimised, resulting in the country's loss of earnings opportunity.

(1) Coverage of the Development Framework

The Development Framework for the development of airports and connecting infrastructure is aimed to setting strategies for the operation of Thailand's airport regulator, to determine guidelines for cooperation with other concerned agencies, in order to keep up with the continued expansion of the aviation sector, and to promote operational integration among all concerned agencies.

The operational strategies under the first Development Framework consist of: (i) Policy aspect: ensuring that all concerned sectors be aware of the goal to promote utilisation of airports in all forms, and (ii) Management aspect: Restructuring Thai airport management to accommodate business demands, carrying out airport development plans in an efficient manner that will benefit the country's future services, optimising the service management system, and developing proper technological systems to enhance service efficiency.

(2) Strategic Direction

Strategic Direction covering: (i) physical development to properly accommodate an increasing number of passengers, (ii) the development of airport systems, especially groundside services, both inside and outside passenger and cargo terminals, will provide assistance for the movement and safety of passengers and cargo between their origin and destination, and (iii) cooperation with agencies related to airport management policies, and those that are closely associated with airports on policy making and joint management.

The framework components and strategies under Development Framework 1 - Airports Development, are shown in Table 1.

Table 1 Framework Components and Strategies under Development Framework 1 - Airports Development

Framework Components	Strategies
Framework Component 1.1 Capacity and utilisation enhancement of airports	Strategy 1 Enhancing capacity of primary hub airports (Group 1) and secondary hub airports (Group 2) to accommodate flights, passengers and cargo Strategy 2 Optimising utilisation of regional airports (Group 3) and local airports (Group 4) Strategy 3 Developing a mechanism to control utilisation of land around airports in a bid to prevent environmental impacts on communities and accommodate future expansion of airports
Framework Component 1.2 Promoting competition in airport management and airport related services	Strategy 1 Promoting a customer-oriented culture at airports Strategy 2 Enhancing the private sector's role in management of regional airports
Framework Component 1.3 Development of the transport systems connecting airports and surrounding urban areas	Strategy 1 Developing the transport system that suits the demand for traveling in and out of airports, in order to enhance capacity of airport linkages to the cities Strategy 2 Developing traffic management systems within and around airport areas to alleviate congestion and reduce air pollution
Framework Component 1.4 Improving airport security standards	Strategy 1 Creating a culture and acquiring sufficient personnel and security devices for strict security measures Strategy 2 Improving security standards and the capacity of inspection and security measures Strategy 3 Improving the risk assessment system for security procedures
Framework Component 1.5 Development of airports for general aviation activities	Strategy 1 Developing General Aviation Airports

Source: Consultant

Detail of the framework components and strategies under the Development Framework for Airports Development are as follows:

1) Framework Component 1.1 Capacity and utilisation enhancement of airports

The goal is to enhance the capacity of Thai airports in a timely manner, in order to respond to the increasing demand for passenger and cargo air transport, through capitalizing the country's geographical advantage, infrastructure and mass transit development growth, and the government's promotion of investment in various areas to stimulate national economic growth.

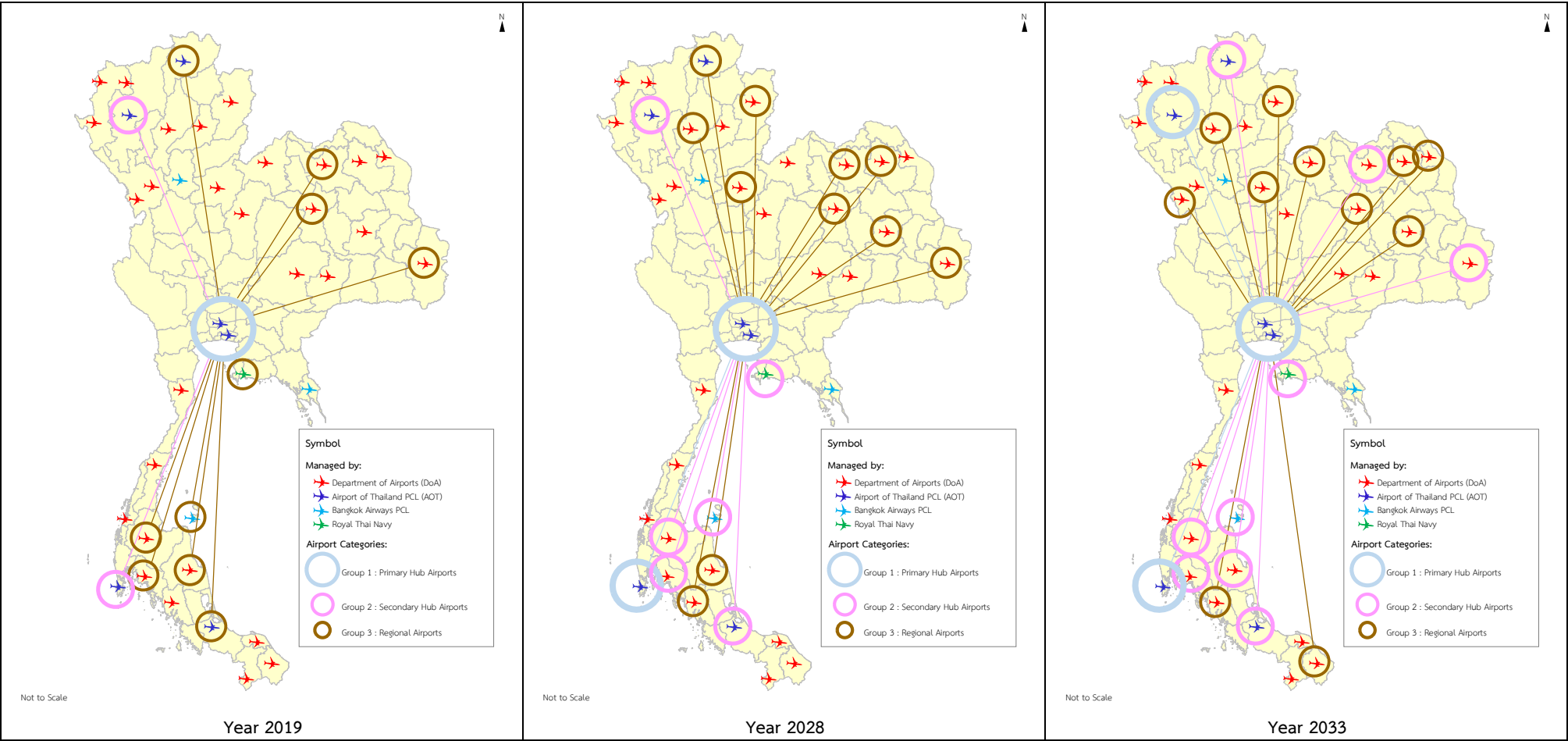
Airports should be holistically managed as an "Airport System", and their positioning should be set to suit the capacity demands on a long-term basis in order to optimise resources in line with aviation market conditions. Airports can be categorised into 4 groups as follows:

- (i) **Group 1: Primary Hub Airports** - Airports that are located in the metropolitan area, and are the connecting points for the global air transport network. There is established infrastructure at these large-scale airports and over 25 million passengers can be accommodated per year. Airports categorised under the group are Suvarnabhumi and Don Muang Airports.

- (ii) **Group 2: Secondary Hub Airports** - Airports that are located in large urban areas and have potential to be upgraded into primary hub airports in order to become connecting points for the global transport network. These airports play an important role in improving services for domestic and international non-connecting flights and alleviating the burden from primary hub airports. There is established infrastructure at these airports, which are equipped as large-scale airports, and approximately 5 to 25 million passengers can be accommodated per year. Airports categorised under the group are Phuket and Chiang Mai Airports.
- (iii) **Group 3: Regional Airports** - Local airports that serve a particular province or another specific area. At these airports, there is established infrastructure for regional aircraft and approximately 1 to 5 million passengers can be accommodated per year. These airports play an important role in improving services for domestic flights that accommodate regional tourism and business. Airports categorised under the group are Hat Yai, Krabi, Udon Thani, Samui, Surat Thani, Chiang Rai's Mae Fah Luang, Ubon Ratchathani, Khon Kaen, and Nakhon Si Thammarat Airports.
- (iv) **Group 4: Local Airports** - Local airports that serve a particular province or another specific area. At these airports, there is established infrastructure for regional aircraft and less than 1 million passengers can be accommodated per year. These airports play an important role in improving services for domestic flights to accommodate provincial tourism and travel. The remaining Thai Airports are under this group.

Airports may move between groups over time due to an increase in travel demand. Taking into consideration the estimated number of future passengers, Figure 8 shows the categorisation of the Thai airports in 2019 (the beginning of the Development Plan), 2028 (goal: Transfer Hub), and 2033 (goal: Global Aviation Hub).

Thai Airport System development has to include all public and private airports in an integrated manner in order for the future development policy to be formulated based on good governance and fairness to commercial airport service providers.



Remark: Airports under Group 4 (local airports) are not identified in the categorisation

Source: Consultant

Figure 8 Categorisation of Thai Airports in 2019, 2028, and 2033

Framework Component 1.1, capacity and utilisation enhancement of airports, consists of the following 3 strategies:

- Strategy 1** *Enhancing capacity of primary hub airports (Group 1) and secondary hub airports (Group 2) to accommodate flights, passengers and cargo.* The focus is on capacity enhancement of primary hub airports (Group 1) and secondary hub airports (Group 2) to accommodate flights, passengers and cargo, and the development of Smart Airports.
- Strategy 2** *Optimising utilisation of regional airports (Group 3) and local airports (Group 4).* The focus is on optimising utilisation of regional airports (Group 3) and local airports (Group 4) with clear airport management strategies that will stimulate national economic growth.
- Strategy 3** *Developing a mechanism to control the utilisation of land around airports in a bid to prevent environmental impacts on communities and accommodate future expansion of airports.* The focus is on preventing the possible impact on the environment and communities due to the expansion of airports, especially the airports in Group 3 that could be upgraded to secondary hub airports when there is an increase in demand for passenger and cargo transport.

2) Framework Component 1.2 Promoting competition in airport management and airport related services

The goal of this component is to adopt a competition mechanism among public and private agencies for the management of Group 2 and Group 3 airports, both for overall management and administration of various activities at the airports.

Encouraging potential private operators to invest in, and bid for, the management of existing and future government-owned airports would engender competition, promote management efficiency, and deliver airports that would better respond to the needs of aviation and other supporting businesses, both for passenger and cargo transport. Better facilities for aviation and other supporting businesses will attract more airlines to use their services, which will also align with demands from tourism and the local economy. This framework component consists of 2 strategies:

- Strategy 1** *Promoting a customer-oriented culture at airports.* The focus of this strategy is to reduce redundant procedures, which have imposed indirect costs on airport users (i.e., airlines, air logistics service providers, and passengers), and offer special privileges to attract potential airline businesses.
- Strategy 2** *Enhancing the private sector's role in management of regional airports.* The focus of this strategy is to promote private sector management of airports in order to enhance competitiveness, attract airlines to use airport services, increase service efficiency, and better respond to the needs of both the aviation business and passengers.

3) Framework Component 1.3 Development of the transport systems connecting airports and surrounding urban areas

The goal of this component is to improve airport service accessibility with a standardised transport system, including the road network, mass transit systems, and other public transport systems in order to facilitate passengers. Traffic management in the immediate airport area will also be improved to reduce congestion that may obstruct travelling in and out of the airports, thereby, indirectly increasing the number of airport users. This framework component consists of 2 strategies, as follows:

- Strategy 1** *Developing transport systems that match the demand for traveling in and out of airports, in order to enhance the capacity of airport linkages to the cities.* Focus of this strategy is on providing suitable mass transit systems that can sufficiently accommodate demand for transport linkages between airports and cities.
- Strategy 2** *Developing traffic management systems within and around airport areas to alleviate congestion and reduce air pollution.* Focus of this strategy is to reduce traffic congestion by managing traffic flow and parking management.

4) Framework Component 1.4 Improving airport security standards

The goal is to develop security standards at airports to international level, in accordance with ICAO requirements, in order to boost airport user confidence and improve security in the departure and arrival areas of airports, as well as onboard aircraft. A security oversight audit system for airports needs to be developed on a par with international standards, both in terms of equipment, operational systems, and personnel. This framework component consists of the following 3 strategies:

- Strategy 1** *Creating a culture and acquiring sufficient personnel and security devices for strict security measures.* The focus is on providing standard security equipment and personnel.
- Strategy 2** *Improving security standards and the capacity of inspection and security measures.* Focus of this strategy is on technological improvement of equipment and the inspection system for both ground and air security.
- Strategy 3** *Improving the risk assessment system for security procedures.* The focus is on promoting information sharing and cooperation with other agencies to enable access to the most-up-to-date security databases.

5) Framework Component 1.5 Development of airports for general aviation activities

The goal is to have airports that can accommodate both general aviation activities and business aviation, the latter which serves premium passenger demands and would generate 10 times more revenue from investment and increase average spending per head, compared to existing commercial aviation activities. At present, Thai commercial service airports mainly accommodate scheduled airlines and charter flights, and provide little space for the landing of business flights, despite the fact that trends for business aviation are now on the rise.

In addition, the secondary goal for the development of both general aviation and business aviation airports is to create a less crowded environment for the supervision and continuous professional development of technicians and pilots. This supports the life cycle of the aviation human resource development process, and improves the quality of trained personnel in the long term. Framework component 1.5 consists of 1 strategy:

- Strategy 1** *Developing General Aviation Airports.* The focus of this strategy is on having airports that will accommodate all types of general/business aviation, and the leasing of space to Fixed-base Operators (FBOs) for charter flights and shared space for flight training centres.

2.3.2 Development Framework 2 - Promoting Airlines and Supporting Businesses

Airlines and supporting businesses are part of the supply chain of air transport, and rely on airports and other types of infrastructure connectivity. Growth of airlines and supporting businesses depends on the capacity of service providers, most of whom are from the private sector. These service providers have to be adaptable to fierce competition in order to accommodate an increasing demand (passenger and air cargo volumes) that has resulted from domestic factors (tourism growth, launch of new airlines and logistics businesses). External international factors, such as growth of traveling and airlines in the Asia-Pacific region, have also increased the demand for MRO and aircraft parts manufacturing. However, airlines and supporting businesses still face challenges with regard to competition on cost and aviation human resource, ease of doing business, loss of opportunity in value-addition, and operational restrictions according to the ICAO's regulations.

(1) Coverage of the Development Framework

The airline business is the core business that mobilises the air transport sector. At present, it is an open market business, therefore, in formulating strategies for the development of airlines and supporting businesses under the Development Plan, it is important to adhere to the principle of free and fair competition of the aviation business. Strategies for the development of airlines and supporting businesses under the Development Plan cover the commercial airline business for passenger and air cargo services, and other airline-supporting businesses, namely, (i) MRO and aircraft parts repair, (ii) aircraft parts and equipment production, and (iii) air transport logistics services.

(2) Strategic Direction

The principle of free and fair competition is adhered to in formulating strategies for this Development Framework by promoting airlines and supporting businesses through the following strategies: (i) improvement of public sector operating mechanisms for ease of doing business. Competition among all sectors within the airline business will be encouraged to ensure service efficiency, and to respond to the needs of passengers, air transport logistics service providers, and airlines. This will attract airlines to use Thailand as a transfer hub; (ii) provide investment stimulus schemes, and promote Thailand as a regional base for MRO and the aircraft parts manufacturing industries in order to accommodate aviation services in the Asia-Pacific; and (iii) promotion of general aviation activities and other related types of business to accommodate the increasing demand of general aviation and premium travellers. This will also help enhance the experience of new technicians and pilots, enabling them to be employed in the commercial airline business.

The framework components and strategies under Development Framework 2 - Promoting Airlines and Supporting Businesses, are shown in Table 2

Table 2 Framework Components and Strategies under Development Framework 2 - Promoting Airlines and Supporting Businesses

Framework 2 Components	Strategies
Framework Component 2.1 Promoting and facilitating the airline business and its supporting businesses in Thailand	Strategy 1 Improving concerned public sector mechanisms to enhance operational flexibility in airlines and other supporting businesses, and to enhance competitiveness of business operators Strategy 2 Promoting cooperation amongst tourism/airport/airlines/local administrative agencies Strategy 3 Improving internal administrative mechanisms of all agencies in the airports to standardise departure, arrival, and CIQ times Strategy 4 Promoting general aviation activities, and other related businesses, which includes business aviation that will accommodate premium travellers Strategy 5 Encouraging concerned public agencies in aviation to formulate integrative investment and management plans with joint KPIs
Framework Component 2.2 Promoting value-added logistics activities for air cargo	Strategy 1 Developing Airport Logistics Parks on a par with global standards Strategy 2 Improving cargo examination and customs processes to better facilitate operators and reduce cost
Framework Component 2.3 Promoting development of MRO businesses and aircraft parts manufacturing	Strategy 1 Facilitating market-driven MRO businesses, as well as other supporting businesses Strategy 2 Promoting Thailand as an aircraft parts manufacturing base in the Asia-Pacific Region

Source: Consultant

Detail of strategies and framework components under Development Framework 2 are as follows:

1) Framework Component 2.1 Promoting and facilitating the airline business and its supporting businesses in Thailand

The goal is to increase the number of airlines at Thailand's primary hub airports, promote the country's primary hubs as hub and sub-hub airports, and for Thailand to become the region's transfer hub. This framework component consists of the following 5 strategies:

- Strategy 1** *Improving concerned public sector mechanisms to enhance operational flexibility in airlines and other supporting businesses, and to enhance competitiveness of business operators.* The focus of this strategy is on the integration of rules and regulations to best facilitate airlines that want to open routes to Thailand, and the airlines that want Thailand to become their future hub or sub-hub.
- Strategy 2** *Promoting cooperation amongst tourism / airport / airlines / local administrative agencies.* The focus of this strategy is on increasing the number of incoming tourists by air and promoting airlines' international aviation network through a proactive marketing scheme.
- Strategy 3** *Improving internal administrative mechanisms of all agencies in the airports to standardise departure, arrival, and CIQ times.* The focus of this strategy is on improving management, airport infrastructure and facilities to enable the control of timings for departure, arrival, and CIQ at standard levels.

- Strategy 4** *Promoting general aviation activities, and other related businesses, which includes business aviation that will accommodate premium travellers.* The focus of this strategy is on promotion of investment (both tariff and non-tariff incentives) for businesses related to general aviation and business aviation, and introduction of an inclusive regulatory regime for general aviation and other related activities, such as use of unmanned aerial vehicles and non-aviation commercial businesses.
- Strategy 5** *Encouraging concerned public agencies in aviation to formulate integrative investment and management plans with joint KPIs.* The focus of this strategy is on determining joint evaluation methods and KPIs in order to be able to evaluate, holistically and individually, each of the agencies.

2) Framework Component 2.2 Promoting value-added logistics activities for air cargo

The goal is to promote value-added activities in the air transport logistics process to generate sustainable revenues for the country. The private sector's role will be enhanced in order to undertake management of the air cargo area in an efficient manner under free and fair competition. Rules and regulations will be revised to facilitate value-added activities. This framework component consists of the following 2 strategies:

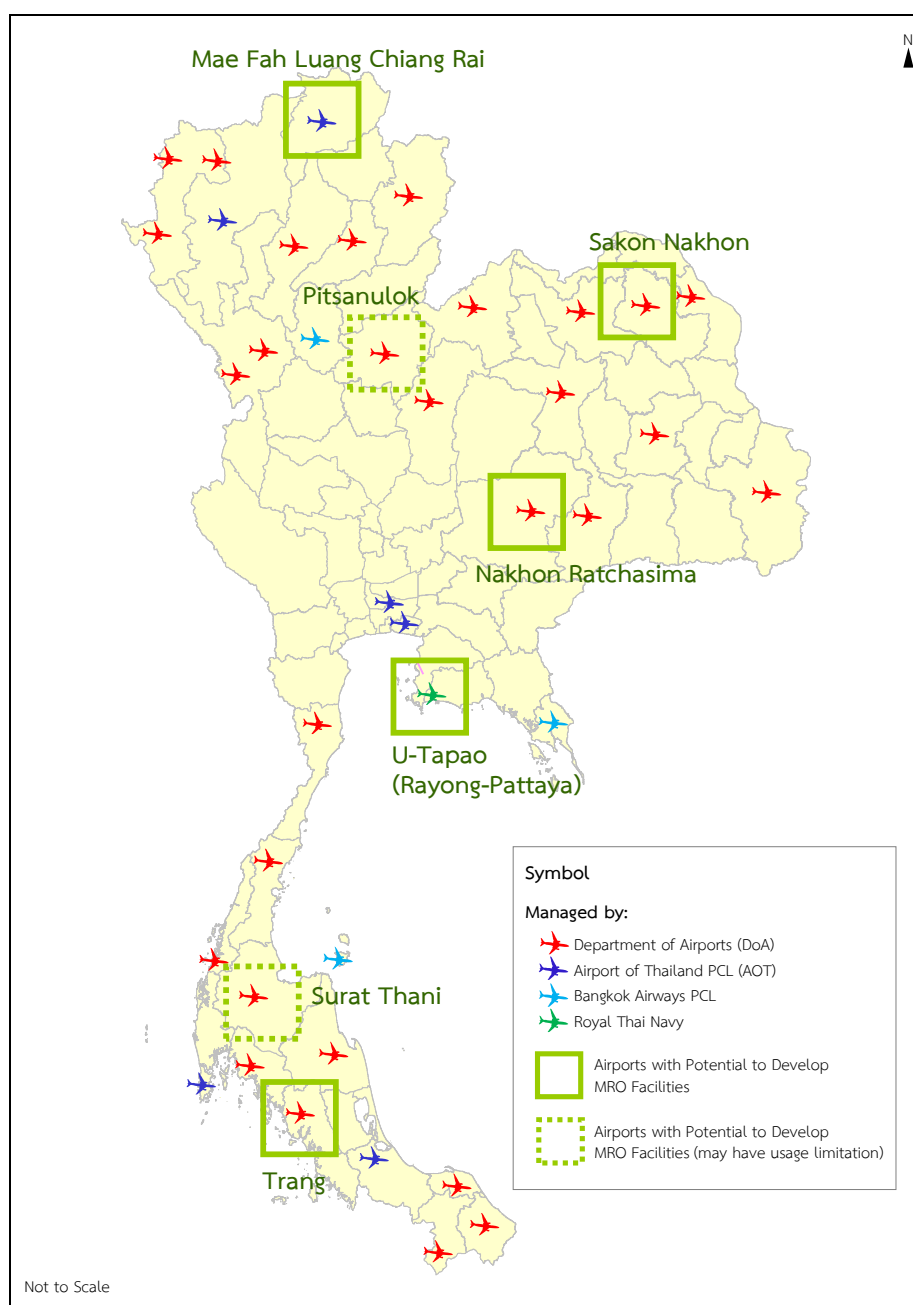
- Strategy 1** *Developing Airport Logistics Parks on a par with global standards.* The focus of this strategy is to establish logistics parks at airports that have potential to become a Cargo Transfer Hub. Airport Logistics Parks are expected to become bases for air transport cargo value-added activities.
- Strategy 2** *Improving cargo examination and customs processes to better facilitate operators and reduce cost.* The focus is on eliminating unnecessary procedures and integrating the operation of all concerned agencies in cargo examination and customs processes.

3) Framework Component 2.3 Promoting development of MRO businesses and aircraft parts manufacturing

The goal is to promote the expansion of MRO for aircraft and aircraft parts, as well as aircraft parts manufacturing industries. In upgrading Thailand's role as a global aviation hub, the government will provide support for establishment of MRO hubs at potential airports throughout the country (Figure 9), in order to enhance business opportunities to accommodate an increasing demand for MRO from countries in the Asia-Pacific region. It is expected that the demand for MRO will continually rise for at least 20 years.

This framework component consists of the following 2 strategies:

- Strategy 1** *Facilitating market-driven MRO businesses, as well as other supporting businesses.* The focus of this strategy is on determining incentives for promoting investment, attracting foreign firms to invest in Thailand and transfer MRO-related technologies, and providing support for the establishment of MRO hubs at potential airports throughout the country.
- Strategy 2** *Promoting Thailand as an aircraft parts manufacturing base in the Asia-Pacific Region.* The focus is on setting the government's goal for attracting investors (Tier-2 and above) for aircraft parts manufacturing in Thailand.



Source: Consultant

Figure 9 Potential Airports in Thailand that may become MRO hubs for aircraft and aircraft parts (which should be studied in further detail)

2.3.3 Development Framework 3 - Development of Air Navigation Services

At present, the number of flights are increasing due to a growing demand for air transport services. According to the results of a comparative analysis, it is predicted that by 2033 the runway capacity of the country's primary hub airports will not be able to accommodate the increase in flight volumes unless capacity enhancement measures are implemented, even though modern equipment and technologies have already been adopted by Thai air navigation services. Cooperation, in order to revise the regulatory regime, is also necessary in developing the country's ANS in an appropriate and systematic manner, including providing clear direction for integration within the concerned sectors.

(1) Coverage of the Development Framework

The Development Framework, for the development of air navigation services, emphasises the formulation of strategies and operational direction to enhance air navigation service capacity, with an aim of ensuring safe and efficient aviation operations. The focus is on enhancement of flight accommodating capacity, cost effectiveness, and constant services through proper infrastructure and basic facilities. The components of air navigation services are as follows:

- Air Traffic Management
- Communications, Navigation, and Surveillance
- Aeronautical Information Management
- Meteorological Services

Although Search and Rescue (SAR) is normally part of air navigation services, it is aimed at providing assistance in cases of aircraft disaster, and is, therefore, not included in this objective, which is to enhance and optimise flight capacity under the Development Framework. SAR will be mentioned in Framework Component 4.1 (Defining a clear and practical regulatory policy).

(2) Strategic Direction

The development of air navigation services to enhance and optimise flight capacity and safety involves the development of the 4 following components:

- Air Traffic Management
- Communications, Navigation, and Surveillance
- Aeronautical Information Management
- Meteorological Services

The framework components and strategies under Development Framework 3 - Development of Air Navigation Services, is shown in Table 3:

Table 3 Framework Components and Strategies under Development Framework 3 - Development of Air Navigation Services

Framework 3 Components	Strategies
Framework Component 3.1 Strengthening Thailand's air navigation service capacity to accommodate ASBU and the Asia/Pacific Seamless ATM Plan	Strategy 1 Developing air traffic services
	Strategy 2 Developing Aeronautical Information Management (AIM)
	Strategy 3 Developing Communications, Navigation, and Surveillance (CNS)
	Strategy 4 Developing Aviation Meteorological Services

Source: Consultant

Detail of the framework components and strategies are as follows:

Framework Component 3.1 Strengthening Thailand's air navigation service capacity to accommodate ASBU and the Asia/Pacific Seamless ATM Plan

Based on the National Airspace Policy, approved by the cabinet on March 13, 2018, the National Transport Policy Committee (new structure), has to set guidelines for the integrated planning of the country's holistic airspace and air navigation system development, in order for concerned agencies to adopt the guidelines when implementing the enhancement and optimisation of long-term air traffic capacity.

At present, aviation stakeholders, be it, the regulatory agency, airlines, air navigation service providers, airport operators, or other related agencies, have a different paradigm of management and administration. As a result, development plans have been individually formulated, without common goals being shared among all concerned agencies. The challenges for air navigation system development are, therefore: (i) to require all concerned agencies to implement the relevant development plan for the upgrade of ground and air navigation equipment, and to jointly operate these under the same timeframe, and (ii) to encourage aviation-related agencies to cooperate in laying out an air navigation development plan, in line with the national airport policy and this Thai Aviation Development Plan, including operational detail, priorities, timeframe, and clear evaluation methods, in order for all concerned sectors to be aware of their responsibilities and to formulate their own action plans in the same direction.

The methodology for the aviation system development shall be in accordance with the Aviation System Block Upgrades (ASBU), designed by the ICAO, which are aimed at development of Air Navigation Services, taking into account existing and future technologies. There is also the Asia/Pacific Seamless ATM Plan to ensure the coordination of aviation system development in all of the countries in the Asia-Pacific region. Therefore, the framework component should be implemented on the basis of strategies and related ICAO plans to ensure that Thailand's implementation is in line with the international framework and practices. The technological adoption timeframe should be as follows:

- Year 2013 - ASBU Block 0
- Year 2015 - Asia/Pacific Seamless ATM Plan Phase I
- Year 2020 - ASBU Block 1 and Asia/Pacific Seamless ATM Plan Phase II
- Year 2022 - Asia/Pacific Seamless ATM Plan Phase III
- Year 2025 - ASBU Block 2
- Year 2031 - ASBU Block 3

Since the ICAO timeframes for ASBU Block 0 and Asia/Pacific Seamless ATM Plan Phase I have already passed, and taking into account the current situation and the necessary budgetary procedures, a priority has been set for Thailand to align with these international development plans by 2020. The timeframe for the development of plans related to ASBU Block 1, Asia/Pacific Seamless ATM Plan Phase II, and Phase III will follow later, by 2022 (no urgency), in order for concerned agencies to have sufficient preparation time. Although this will be later than the ICAO timeframe by 3 years, the planning for ASBU Block 2 will be targeted for 2025, and ASBU Block 3, for 2031, in accordance with the ICAO timeframe.

The ICAO does not obligate all countries to comply with its ASBU and the Asia/Pacific Seamless ATM Plan, but urges each country to formulate their national development plans based on internal demands and nature of their operations. However, in order to prevent future problems related to accommodating growth in flight capacity, and to develop the Thai aviation system in line with regional and international standards, thereby, enhancing safety and efficiency of the air navigation system at both national and regional levels, the ASBU and Asia/Pacific Seamless ATM Plan have to be taken into consideration and integrated into the development planning by all concerned agencies, to ensure compliance.

The goal of this framework component is to enhance the capacity of Thailand's air navigation systems to meet the increasing demand for the country's passenger and air cargo transport, in order to upgrade the country to a World Class Hub for Aviation Business. Development plans of all concerned agencies will be formulated in an integrated manner, aligning with the national air navigation policy and the ICAO's and regional Strategic Direction.

The strategies under this framework component 3.1 are as follows:

- Strategy 1** *Developing air traffic services.* The focus is on enhancing the capacity of air traffic at all times, both at the aerodrome, terminal, and en-route.
- Strategy 2** *Developing Aeronautical Information Management (AIM).* The focus is on formulating an aeronautical information management plan in line with the directive and timeframe of ASBU and the Asia/Pacific Seamless ATM Plan.
- Strategy 3** *Developing Communications, Navigation, and Surveillance (CNS).* The focus is on developing a plan to enhance communications, navigation, and surveillance systems.
- Strategy 4** *Developing Aviation Meteorological Services.* The focus is on developing a plan for aviation meteorology that will enhance aviation safety and efficiency. Information related to aviation meteorology must be directly accessible to users (air traffic service providers and aviation operators).

2.3.4 Development Framework 4 - Development of the Regulatory Mechanism and Related Regulations

Air transport regulation involves 2 important issues: (i) technical regulation (safety and security), and (ii) economic regulation, which have to be aligned with each other in order to ensure air transport safety is on a par with international aviation standards, without posing obstacles to air transport-related business operations. One important tool is the management of organisations, related laws and regulations.

Thailand's current structure of air transport regulation has engendered more freedom and flexibility in the operation of all concerned agencies. A number of laws and regulations have been reviewed and amended to facilitate and promote air transport business operations.

(1) Coverage of the Development Framework

The development framework for the development of a regulatory mechanism and related regulations has produced strategies and operational direction for organisational development, revision of laws and regulations related to air transport, implementation of a public interest protection system, as well as promoting free and fair competition in the aviation industry. Goals and objectives include:

- Establishing a capable and efficient regulatory regime and regulatory body for both technical and economic regulation.
- Standardising and systemising a technical regulation system on a par with those of developed countries.
- Placing a priority on public rights/consumer protection.
- Promoting efficient, sufficient and fair air transport services.
- Ensuring free and fair competition, whilst precluding monopolies.

- Optimising utilisation of the country's public resources, i.e., national airspace, allocation of rights under the Air Services Agreement, carbon credits, etc.
- Complying with the obligations under the Convention on International Civil Aviation, as an ICAO member country.

(2) Strategic Direction

Strategies for the development framework on development of a regulatory mechanism and related regulations will focus on the following 3 aspects:

- Setting regulatory policy in a clear and tangible manner, both for technical and economic regulation. For technical regulation, the focus will be on setting policy, i.e., towards the FAA and/or the EASA, that stands above the minimum standard of the International Civil Aviation Organisation (ICAO). While for economic regulation, the priority will be on setting policy to ensure free and fair competition in the aviation industry.
- Authority and organisational improvements to be in line with regulatory policy and accommodate increasing responsibilities.
- Revision of laws and regulations to be in line with both the technical and economic regulatory policy.

The framework components and strategies under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations, is shown in Table 4.

Table 4 Framework Components and Strategies under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations

Framework 4 Components	Strategies
Framework Component 4.1 Defining a clear and practical regulatory policy	Strategy 1 Setting regulatory policy for economic regulation to ensure free and fair competition Strategy 2 Setting regulatory policy for technical regulation that stands above the minimum standard of the International Civil Aviation Organisation (ICAO) Strategy 3 Setting safety management policy Strategy 4 Setting policy that supports and engenders the growth of other aviation activities Strategy 5 Developing a regulatory mechanism for free and fair competition in airport management Strategy 6 Developing a mechanism to ensure efficiency and independence of aircraft accident investigation Strategy 7 Developing a mechanism for aircraft search and rescue on a par with international standards
Framework Component 4.2 Capacity building of the regulatory body	Strategy 1 Capacity building of the regulatory agency (economic affairs) in line with the policy on free and fair competition in the aviation business Strategy 2 Improving roles and authorities for technical regulatory affairs Strategy 3 Developing data collection systems for the planning and management of technical and economic affairs
Framework Component 4.3 Improvement of the legal framework in the aviation sector	Strategy 1 Developing economic-related laws and regulations in line with the policy on free and fair competition in the aviation business Strategy 2 Efficiency enhancement of technical-related laws and regulations

Source: Consultant

Detail of framework components and strategies under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations are as follows:

1) Framework Component 4.1 Defining a clear and practical regulatory policy

The goal is to set-up a clear air transport regulatory policy (economic and technical regulation) at both domestic and international levels. This is to promote efficient regulation, in terms of structure and operation of the regulatory agencies, related laws and regulations. This framework component consists of 7 strategies, as follows:

- Strategy 1** *Setting regulatory policy for economic regulation to ensure free and fair competition.* The focus is on setting economic regulatory policy for air transport at two levels: (i) international level, and (ii) domestic level
- Strategy 2** *Setting regulatory policy for technical regulation that stands above the minimum standard of the International Civil Aviation Organisation (ICAO).* The focus is on setting a clear policy on responsibilities, duties and technical regulation standards, which includes safety and security, for all aviation activities.
- Strategy 3** *Setting safety management policy.* The focus of this strategy is on creating a safety culture, and Safety Data Collection and Processing System (SDCPS), in line with the ICAO's Annex 19.
- Strategy 4** *Setting policy that supports and engenders the growth of other aviation activities.* The focus here is on revising rules and regulations to keep up with current aviation practices and technologies.
- Strategy 5** *Developing a regulatory mechanism for free and fair competition in airport management.* The focus is on implementing a clear mechanism for inspection and evaluation of airport service efficiency in a bid to stimulate competition in airport management.
- Strategy 6** *Developing a mechanism to ensure efficiency and independence of aircraft accident investigation.* The focus is on developing a system and mechanism of aircraft accident investigation to ensure it is in line with the ICAO's Annex 13.
- Strategy 7** *Developing a mechanism for aircraft search and rescue on a par with international standards.* The focus is on developing a system and mechanism of aircraft search and rescue to ensure it is in line with the ICAO's Annex 12.

2) Framework Component 4.2 Capacity building of the regulatory body

The goal is to restructure the regulatory body in terms of regulation, authority, roles and responsibilities, so that they align with regulatory policy. It is also to enhance operational capacity and promote good governance, Rules of Laws, transparency, and social responsibility for both technical and economic regulatory affairs in accordance with international practice. This framework component consists of the following 3 strategies:

- Strategy 1** *Capacity building of the regulatory agency (economic affairs) in line with "the policy on free and fair competition in the aviation business".* The focus is on improving regulatory measures to include the inspection and monitoring of competition of private companies in the aviation industry, other than pricing competition, in accordance with the law.
- Strategy 2** *Improving roles and authorities for technical regulatory affairs.* The focus of this strategy is on developing the regulatory body to ensure they have full authority and independence, in line with the ICAO's critical elements of technical regulation.
- Strategy 3** *Developing data collection systems for the planning and management of technical and economic affairs.* The focus is on improving data systems for safety and economic information, as well as the number of flights, passengers and air cargo volume at all airports and for all domestic and international flights.

3) Framework Component 4.3 Improvement of the legal framework in the aviation sector

The goal is to revise aviation laws and regulations, related to technical and economic regulation, and align them with international standards and practice, in order to accommodate present and future aviation business development. This framework component consists of 2 strategies:

Strategy 1 *Developing economic-related laws and regulations in line with “the policy on free and fair competition in the aviation business”.* The focus is on revising laws and regulations related to competition in the aviation business and on protecting passengers' rights.

Strategy 2 *Efficiency enhancement of technical-related laws and regulations.* The focus is on simplifying laws and regulations in accordance with international practice.

2.3.5 Development Framework 5 - Aviation Human Resource Development

Aviation human resource is an important precursor to the mobilisation of Thailand's aviation sector. An increase in air transport volume requires Thailand to produce sufficient personnel to meet the current and future demand. At present, many public and private educational institutes and agencies have launched curricula for training courses in ground support and air transport. However, on the whole, standards vary, and some of the personnel produced from these institutes do not meet the requirements of the current aviation market, which may result in lack of skilled personnel for the aviation sector in the future.

(1) Coverage of the Development Framework

The development framework for aviation human resource development aims at both quantity and quality of human resources, and focuses on professions which require operating licenses under international aviation standards. At present, there is the need for personnel development to meet the future demand for pilots, trainers and aircraft technicians through the improvement of aviation human resource training institutes, ensuring that there is a proper regulatory system in place, on a par with international standards, providing quality control of graduated personnel and a mechanism for maintaining educational training standards and efficiency. A priority is also given to enhancing the knowledge of public sector personnel working in aviation-related organisations, in order to increase the capability of staff at all levels, and prepare them for the future development of aviation technology.

(2) Strategic Direction

Strategies for Thailand's aviation human resource development are aimed at addressing the lack of personnel in both quantitative and qualitative dimensions. The priority is placed on personnel capacity and quality enhancement that meets the aviation market requirements and accommodates future growth of the aviation business. This approach will support Thailand towards becoming both a “Global Aviation Hub” and an ASEAN aviation human resource development hub. The development direction and process of turning out personnel from all concerned institutes and agencies will be made relevant to the future demands for the aviation workforce, both in terms of quantitative dimension (supply vs demand), and qualitative dimension (operational skills on a par with international standards).

The framework components and strategies under the Development Framework 5 - Aviation Human Resource Development, are shown in Table 5:

Table 5 Framework Components and Strategies under Development Framework 5 - Aviation Human Resource Development

Framework 5 Components	Strategies
Framework Component 5.1 Upgrading aviation human resource development standards in order to be responsive to business needs	Strategy 1 Promoting collaboration among academic institutes and training centres, in both public and private sectors, to develop curricula that are on a par with, or above, ICAO standards (e.g. EASA or FAA) Strategy 2 Developing and setting a mechanism for curricula standard control Strategy 3 Developing and providing support for academic institutes and training centres to be equipped with sufficient and proper facilities Strategy 4 Increasing the number of instructors to accommodate demand for aviation human resource Strategy 5 Establishing aviation human resource production centres in other high-potential regions of the country
Framework Component 5.2 Capacity building of the current workforce in the aviation business	Strategy 1 Continuously enhancing aviation skills and knowledge among public sector personnel working in aviation-related organisations

Source: Consultant

Detail of the framework components and strategies are as follows:

1) **Framework Component 5.1 Upgrading aviation human resource development standards in order to be responsive to business needs**

The goal is to produce sufficient aviation human resources to meet future demands, both in a qualitative and quantitative measure by: (i) promoting collaboration between academic institutes and training centres, of both public and private sectors, to ensure quality and standardisation, (ii) curricula standard and quality control, and (iii) provision of training sites (classrooms, labs, and field training sites) of a high standard, with modern facilities, and skillful trainers. Utilisation of regional airports as training sites will be encouraged. This framework component consists of 5 strategies:

- Strategy 1** *Promoting collaboration among academic institutes and training centres, in both public and private sectors, to develop curricula that are on a par with, or above, the ICAO standards (e.g. EASA or FAA).* The focus is on producing aviation human resource, according to the level of requirement, and based on ICAO/EASA/FAA standards.
- Strategy 2** *Developing and setting a mechanism for curricula standard control.* The focus is on controlling quality standards of the curricula, which will be certified by the ICAO.
- Strategy 3** *Developing and providing support for academic institutes and training centres to be equipped with sufficient and proper facilities.* The focus is on providing equipment, tools and devices to the academic institutes and training centres.
- Strategy 4** *Increasing the number of instructors to accommodate demand for aviation human resource.* The focus is on revising rules and regulations to ensure proper remuneration and benefits for trainers, and to be able to hire foreign experts or retired experts on a temporary basis.
- Strategy 5** *Establishing aviation human resource production centres in other high-potential regions of the country.* The focus is on utilising regional airports as aviation training sites and optimising the use of airport resources and air navigation facilities.

2) Framework Component 5.2 Capacity building of the current workforce in the aviation business

The goal is to enhance the capacity of aviation human resource in order to become internationally recognised. Personnel in all sectors of the aviation business must have a thorough understanding and knowledge of their job, and should continually learn and develop themselves professionally, especially in the technical skills needed for each operational element, since the aviation business requires an up-to-date knowledge of developing technology and skills. Aviation human resource should be provided with a platform to share information and experiences for self-development and capacity enhancement. Priority should also be placed on language skill enhancement. This framework component consists of a single strategy:

Strategy 1 *Continuously enhancing aviation skills and knowledge among public sector personnel working in aviation-related organisations.* The focus is on development of skills within the aviation human resource, especially language skills, to accommodate aviation industrial growth.

In summary, the 5 frameworks for the Thai aviation sector, together with their framework components and strategies, will enable the country to achieve its vision in 2033. However, the immediate goal that needs to be achieved first, is to become a transfer hub, which may take 10 years. The final 5 years of the Master Plan will transform the country to become a global aviation hub. This is shown in Table 6.

During the first 10 years, framework components and strategies are aimed at Thailand becoming a 'Transfer Hub' and further development continues until the end of the 15-Year Thai Aviation Development Plan (2019-2033). Concerned agencies will have to set another common goal after year 10.

Other framework components and strategies are aimed at Thailand becoming a "global aviation hub". The timeframe for this goal starts at the commencement of the Thai Aviation Development Plan to its completion, 15 years later, since the country's status as a "Transfer Hub" is a precursor to being upgraded to a "Global Aviation Hub", both in terms of marketing, regulation mechanisms, infrastructure, and aviation human resource. Besides, the MRO business for aircraft and aircraft parts, as well as aircraft parts manufacturing industries, will need considerable time to be developed, through building the credibility of internal regulation mechanisms and market creation, to accommodate the emerging industries.

KPIs have been determined, from data analysis, the condition of competition, the current situation and problems related to air transport, to be the guidelines for evaluating efficiency and effectiveness of the air transport system, transport facilitation, utilisation of transport infrastructure, and international competitiveness. However, concerned agencies could, within the overall principle of the Development Plan, choose to adapt the timeframes, and to modify suggested KPIs according to future circumstances.

Table 6 Framework Components, Strategies and Goals for Thailand to Achieve 'Global Aviation Hub' Status

Framework Component	Strategies	Achievement Timeframe	
		within 10 Yrs	within 15 Yrs
Development Framework 1 - Airports Development			
Framework Component 1.1 Capacity and utilisation enhancement of airports	Strategy 1 Enhancing capacity of primary hub airports (Group 1) and secondary hub airports (Group 2) to accommodate flights, passengers and cargo	✓	✓
	Strategy 2 Optimising utilisation of regional airports (Group 3) and local airports (Group 4)	✓	✓
	Strategy 3 Developing a mechanism to control utilisation of land around airports in a bid to prevent environmental impacts on communities and accommodate future expansion of airports	✓	
Framework Component 1.2 Promoting competition in airport management and airport related services	Strategy 1 Promoting a customer-oriented culture at airports	✓	✓
	Strategy 2 Enhancing the private sector’s role in management of regional airports	✓	
Framework Component 1.3 Development of the transport systems connecting airports and surrounding urban areas	Strategy 1 Developing transport systems that match the demand for traveling in and out of airports, in order to enhance capacity of airport linkages to cities	✓	
	Strategy 2 Developing traffic management systems within and around airport areas to alleviate congestion and reduce air pollution	✓	
Framework Component 1.4 Improving airport security standards	Strategy 1 Creating a security culture and acquiring sufficient personnel and security devices for strict security measures	✓	✓
	Strategy 2 Improving security standards and the capacity of inspection and security measures	✓	
	Strategy 3 Improving the risk assessment system for security procedures	✓	
Framework Component 1.5 Development of airports for general aviation activities	Strategy 1 Developing General Aviation Airports	✓	✓
Development Framework 2 - Promoting Airlines and Supporting Businesses			
Framework Component 2.1 Promoting and facilitating the airline business and its supporting businesses in Thailand	Strategy 1 Improving concerned public sector mechanisms to enhance operational flexibility of airlines and other supporting businesses, and to enhance competitiveness of business operators	✓	
	Strategy 2 Promoting cooperation amongst tourism/airport/airlines/local administrative agencies	✓	✓
	Strategy 3 Improving internal administrative mechanisms of all agencies in the airports to standardise departure, arrival, and CIQ times	✓	
	Strategy 4 Promoting general aviation activities, and other related businesses, which includes business aviation that will accommodate premium travellers	✓	✓
	Strategy 5 Encouraging concerned public agencies in aviation to formulate integrative investment and management plans with joint KPIs	✓	✓
Framework Component 2.2 Promoting value-added logistics activities for air cargo	Strategy 1 Developing Airport Logistics Parks on a par with global standards	✓	✓
	Strategy 2 Improving cargo examination and customs processes to better facilitate operators and reduce cost	✓	
Framework Component 2.3 Promoting development of MRO businesses and aircraft parts manufacturing	Strategy 1 Facilitating market-driven MRO businesses, as well as other supporting businesses		✓
	Strategy 2 Promoting Thailand as an aircraft parts manufacturing base in the Asia-Pacific Region		✓

Table 6 Framework Components, Strategies and Goals for Thailand to Achieve 'Global Aviation Hub' Status (Continued)

Framework Component	Strategies	Achievement Timeframe	
		within 10 Yrs	within 15 Yrs
Development Framework 3 - Development of Air Navigation Services			
Framework Component 3.1 Strengthening Thailand’s air navigation service capacity to accommodate ASBU and the Asia/Pacific Seamless ATM Plan	Strategy 1 Developing air traffic services	✓	✓
	Strategy 2 Developing Aeronautical Information Management (AIM)	✓	
	Strategy 3 Developing Communications, Navigation, and Surveillance (CNS)	✓	✓
	Strategy 4 Developing Aviation Meteorological Services	✓	✓
Development Framework 4 - Development of the Regulatory Mechanism and Related Regulations			
Framework Component 4.1 Defining a clear and practical regulatory policy	Strategy 1 Setting regulatory policy for economic regulation to ensure free and fair competition	✓	✓
	Strategy 2 Setting regulatory policy for technical regulation that stands above the minimum standard of the International Civil Aviation Organisation (ICAO)	✓	✓
	Strategy 3 Setting a safety management policy	✓	✓
	Strategy 4 Setting policy that supports and engenders the growth of other aviation activities	✓	✓
	Strategy 5 Developing a regulatory mechanism for free and fair competition in airport management	✓	✓
	Strategy 6 Developing a mechanism to ensure efficiency and independence of aircraft accident investigation	✓	
	Strategy 7 Developing a mechanism for aircraft search and rescue on a par with the international standards	✓	
Framework Component 4.2 Capacity building of the regulatory body	Strategy 1 Capacity building of the regulatory agency (economic affairs) in line with the policy on free and fair competition in the aviation business	✓	
	Strategy 2 Improving roles and authorities for technical regulatory affairs	✓	
	Strategy 3 Developing data collection systems for the planning and management of technical and economic affairs	✓	✓
Framework Component 4.3 Improvement of the legal framework in the aviation sector	Strategy 1 Developing economic-related laws and regulations in line with the policy on free and fair competition in the aviation business	✓	✓
	Strategy 2 Efficiency enhancement of technical-related laws and regulations	✓	
Development Framework 5 - Aviation Human Resource Development			
Framework Component 5.1 Upgrading the aviation human resource development standards in order to be responsive to business needs	Strategy 1 Promoting collaboration among academic institutes and training centres, in both public and private sectors, to develop curricula that are on a par with, or above, the ICAO standards (e.g. EASA or FAA)	✓	✓
	Strategy 2 Developing and setting a mechanism for curricula standard control	✓	✓
	Strategy 3 Developing and providing support for academic institutes and training centres to be equipped with sufficient and proper facilities	✓	✓
	Strategy 4 Increasing the number of instructors to accommodate demand for aviation human resource	✓	
	Strategy 5 Establishing aviation human resource production centres in other high-potential regions of the country	✓	✓
Framework Component 5.2 Capacity building of the current workforce in the aviation business	Strategy 1 Continuously enhancing aviation skills and knowledge among public sector personnel working in aviation-related organisations	✓	✓

Source: Consultant

2.4 KPIs for Thai Aviation Development

Overall goals set for the 15-Year Thai Aviation Development Plan (2019-2033) will produce integrated outcomes from more than one development framework:

- 1) Direct and indirect benefits from aviation activities, which will help stimulate national economic development as a whole,
- 2) Tangible and clear economic regulations for aviation activities, and
- 3) More economic value from aviation operations through capacity enhancement of airspace and air traffic management.

In summary, taking a high-level overview of the Thai Aviation Development Plan, which integrates the operation of all concerned agencies to achieve the goal of a “Global Aviation Hub”, the suggested KPIs are shown in Table 7.

Table 7 Suggestion of Overall KPIs

No.	KPIs	Year 2028 (Transfer Hub)	Year 2033 (Global Hub)	Data Source
1	Percentage of direct and indirect benefits from overall air transport activity per GDP	Not less than 1.5% per year	Not less than 1.5% per year	Office of National Economic and Social Development Board
2	Minimum Connecting Time (MCT)	70 minutes	60 minutes	Airports of Thailand, Pcl/Department of Airports/ U-Tapao Airport (Royal Thai Navy)/ Private Commercial Airport Operators
3	Passenger volume	298 million passengers per year	422 million passengers per year	Airports of Thailand, Pcl/Department of Airports/ U-Tapao Airport (Royal Thai Navy)/ Private Commercial Airport Operators
4	Cargo volume	1.8 million tonnes per year	2.0 million tonnes per year	Airports of Thailand, Pcl/Department of Airports/ U-Tapao Airport (Royal Thai Navy)/ Private Commercial Airport Operators
5	Total revenue from MRO in Thailand*	- Not yet estimated -	20,000 million Baht per year	Airports of Thailand, Pcl/Department of Airports/ U-Tapao Airport (Royal Thai Navy)/ Private Commercial Airport Operators

Remark: Revised from a forecast according to the feasibility study on preliminary design for Thailand's aviation industrial estate establishment (October 2015)

Source: Consultant

Detailed KPIs for each of the strategies will be determined at an operational level, in line with the above Overall KPIs. Some of these KPIs should be established jointly by multiple agencies, both public and private, with common guidelines and the level of success expected by the government incorporated, in order to enhance national competitiveness at the initial stage. KPI evaluation is divided into 2 phases: (i) KPI assessment of the Transfer Hub, and (ii) KPI assessment of the Global Aviation Hub (which will be the KPI's for the Transfer Hub with further details included). Some of the KPIs may already be used and evaluated, but are hindered by restrictions on capacity enhancement. So, it is more appropriate for the KPI evaluations to be performed from 2022 onward when all concerned sectors and infrastructure development will be ready, and data collection systems have been improved. KPIs for each development framework are shown in Table 8.

Nevertheless, the Ministry of Transport may need to seek common ground with concerned agencies on KPI goals after the Plan has been implemented. The National Transport Policy Committee should take on the role of performance evaluator for Thai Aviation Development, once it is established.

Table 8 Significance of KPIs for Each Development Framework of Thai Aviation Development

Development Framework	KPIs	2028 Goal	2033 Goal	Significance of KPIs
Airports Development	• Average time for management of arrival passengers	Determined by concerned agencies	Determined by concerned agencies	• To compare level of services with other airports and to accommodate transport growth
	• Average time for management of departure passengers	Determined by concerned agencies	Determined by concerned agencies	• To compare level of services with other airports and to accommodate transport growth
	• Average time for traveling in and out of airport via mass transit system to (and from) inner urban areas	Determined by concerned agencies	Determined by concerned agencies	• To compare level of services with other airports and to accommodate transport growth
	• Percentage of aircraft on-time performance	Determined by concerned agencies	Determined by concerned agencies	• To compare management efficiency with other airports
	• ICAO inspection results under USAP-CMA program	No Significant Security Concern (SSeCs)	Sustaining evaluation results	• To maintain related standards and boost confidence in the Thai government's management and regulation
	• Evaluation results for Thailand under USAP-CMA program	Higher than average evaluation results (all countries combined)	Higher than average evaluation results (all countries combined)	• To maintain related standards and boost confidence in the Thai government's management and regulation
	• Establishment of general aviation airports	- Not yet evaluated -	At least 1 airport	• To enhance the investment environment and opportunities, and minimize transport-related challenges
	• Percentage of airport user satisfaction	85%	85%	• To maintain management-related standards
	• Average time for cargo handling between aircraft and warehouse	- Not yet evaluated -	Determined by concerned agencies	• To compare management efficiency with other airports
	• Private sector's co-investment and management of regional airports (Group 3)	- Not yet evaluated -	At least 2 airports	• To enhance the investment environment and opportunities, and minimize transport-related challenges
Promoting Airlines and Supporting Business	• Number of passengers on international flights	146 million	206 million	• To compare level of services and growth with other airports
	• Number of passengers on domestic flights	152 million	216 million	• To compare level of services and growth with other airports
	• Number of flights	2.6 million flights/year	3.6 million flights/year	• To compare level of services with other airports
	• Cargo volume through Airport Logistics Parks	1.8 million tons/year	2.0 million tons/year	• To compare management efficiency with other airports
	• Number of Airports Served	200 airports	220 airports	• To enhance the investment environment and opportunities, and minimize transport-related challenges
	• MRO's capacity (C-Check maintenance) at regional airports	- Not yet evaluated -	At least 5 airports	• To compare service capacity with other countries
	• MRO's capacity (D-Check maintenance) at regional airports	- Not yet evaluated -	At least 1 airport	• To compare service capacity with other countries
	• Tier-1 and Tier-2 aircraft parts manufacturing industry	- Not yet evaluated -	Tier-1 and Tier-2 aircraft parts industry	• To accommodate economic development and MRO businesses
	• Number of licensing applications for operation in General Aviation (number of operators, activities and registered aircraft)	- Not yet evaluated -	Determined by concerned agencies	• To compare level of services and growth with other airports

Table 8 Significance of KPIs for Each Development Framework of Thai Aviation Development (Continued)

Development Framework	KPIs	2028 Goal	2033 Goal	Significance of KPIs
Development of Air Navigation Services	• Separation Minimal Infringement at 100,000 flights	Determined by concerned agencies	Determined by concerned agencies	• To maintain related standards and boost confidence in the Thai government's management and regulation • To minimize loss, and control time and cost of operators
	• Taxi-out Delay at Group 1 and Group 2 airports	Determined by concerned agencies	Determined by concerned agencies	• To maintain related standards and boost confidence in the Thai government's management and regulation • To minimize loss, and control time and cost of operators
	• Capacity of aviation system when comparing with the development goals under the plan for Thailand's aviation system capacity building	- Not yet evaluated -	Awaiting study outcome from concerned agencies	• To maintain related standards and boost confidence in the Thai government's management and regulation • To minimize loss, and control time and cost of operators
Development of the Regulatory Mechanism	• FAA inspection results under IASA Program*	Category 1	Sustaining evaluation result	• To maintain related standards and boost confidence in the Thai government's management and regulation
	• Thailand inspection results under USOAP-CMA Program, which is higher than the average result (for all countries combined)	Thailand inspection results comparing with average results	Thailand inspection results comparing with average results	• To maintain related standards and boost confidence in the Thai government's management and regulation
	• Number of serious Incidents per 100,000 Aircraft Movements	0	0	• To maintain related standards and boost confidence in the Thai government's management and regulation
	• Compliance with rules and regulations related to promotion of free and fair competition in the aviation business (Transport Ministerial Announcement on Condition and Criteria for Air Operating Licensing, B.E. 2559)	Compliance with rules and regulations	Maintaining levels or adjusting according to situation	• To create awareness among the public and, especially, the private sector, on the promotion of economic regulation for free and fair competition
	• Implementation of measures, rules and regulations to monitor and analyse operator behavior in the aviation business, to determine who might cause distortion of competition and do not comply with the free and fair competition policy	Determined by concerned agencies	Maintaining levels or adjusting according to situation	• To upgrade economic regulation standards, and promote clear and tangible regulations that are in line with free and fair competition policy
	• More negotiations on the formulation/revision of agreements on air navigation services, both at bilateral and multilateral levels, to further promote free and fair competition	Determined by concerned agencies	Maintaining or setting higher levels	• To create opportunity for potential Thai operators in efficiently expanding businesses overseas without any trade and investment barriers
	• Percentage of passenger complaints on air transport services (airlines), and airport operators	To be decreased from 2022 percentage base rate	Maintaining or further reducing the rate	• To upgrade consumer protection, passengers' rights and protection standards, both on domestic and international routes
Aviation Human Resource Development	• Number of personnel produced per year (total number before being certified)	Determined by concerned agencies	Determined by concerned agencies	• To reduce opportunity risk in responding to increasing demand (resulting from air transport growth)
	• Number of personnel produced and certified per year	Determined by concerned agencies	Determined by concerned agencies	• To reduce opportunity risk in responding to increasing demand (resulting from air transport growth)
	• Percentage of new graduates in the aviation business	Determined by concerned agencies	Determined by concerned agencies	• To reduce opportunity risk in responding to increasing demand (resulting from air transport growth)

Remark: *International Aviation Safety Assessment

Source: Consultant

2.5 Planned Projects/Measures Under the 15-Year Thai Aviation Development Plan (2019-2033)

A summary of the total investment budget for planned projects/measures under the 15-Year Thai Aviation Development Plan (2019-2033) is shown in Table 9. Details regarding the timeline for the 5 development frameworks are shown in Appendix A (Table A-1 to Table A-5).

Table 9 Total Investment Budget under the 5 Development Frameworks

No.	Development Framework		Total Investment Budget (million Baht)	No.	
				Project	Measure
1	Development Framework 1 - Airports Development				
1.1	Framework Component 1.1	Capacity and utilisation enhancement of airports	116,644.0 ¹	13	2
1.2	Framework Component 1.2	Promoting competition in airport management and airport related services	460.0	5	4
1.3	Framework Component 1.3	Development of the transport systems connecting airports and surrounding urban areas	113,675.0 ²	5	1
1.4	Framework Component 1.4	Improving airport security standards	1,237.0	8	4
1.5	Framework Component 1.5	Development of airports for general aviation activities	9,430.0 ³	2	-
Total			241,446.0	33	11
2	Development Framework 2 - Promoting Airlines and Supporting Businesses				
2.1	Framework Component 2.1	Promoting and facilitating the airline business and its supporting businesses in Thailand	810.0	7	5
2.2	Framework Component 2.2	Promoting value-added logistics activities for air cargo	200.0	6	2
2.3	Framework Component 2.3	Promoting development of MRO businesses and aircraft parts manufacturing	4,594.0 ⁴	4	2
Total			5,604.0	17	9
3	Development Framework 3 - Development of Air Navigation Services				
3.1	Framework Component 3.1	Strengthening Thailand's air navigation service capacity to accommodate ASBU and the Asia/Pacific Seamless ATM Plan	5,043.0 ⁵	6	11
Total			5,043.0	6	11
4	Development Framework 4 - Development of the Regulatory Mechanism and Related Regulations				
4.1	Framework Component 4.1	Defining a clear and practical regulatory policy	301.0	14	3
4.2	Framework Component 4.2	Capacity building of the regulatory body	275.0	7	4
4.3	Framework Component 4.3	Improvement of the legal framework in the aviation sector	40.0	2	1
Total			616.0	23	8
5	Development Framework 5 - Aviation Human Resource Development				
5.1	Framework Component 5.1	Upgrading aviation human resource development standards in order to be responsive to business needs	120.0	5	6
5.2	Framework Component 5.2	Capacity building of the current workforce in the aviation business	165.0	2	1
Total			285.0	7	7
Grand Total			252,994.0	86	46

Remark: ¹ Inclusive of AOT's planned budget of 115,914 million Baht

² Inclusive of MRTA's planned budget of 113,400 million Baht

³ Inclusive of estimated budget for development of Business Aviation Airport of 9,400 million Baht (from "Feasibility study of the Establishment of airport for Business Aviation", Department of Airport, 2018)

⁴ Inclusive of THAI's planned budget of 4,294 million Baht

⁵ Inclusive of AEROTHAI's planned budget of 4,833 million Baht

Source: Analysed by Consultant

3.

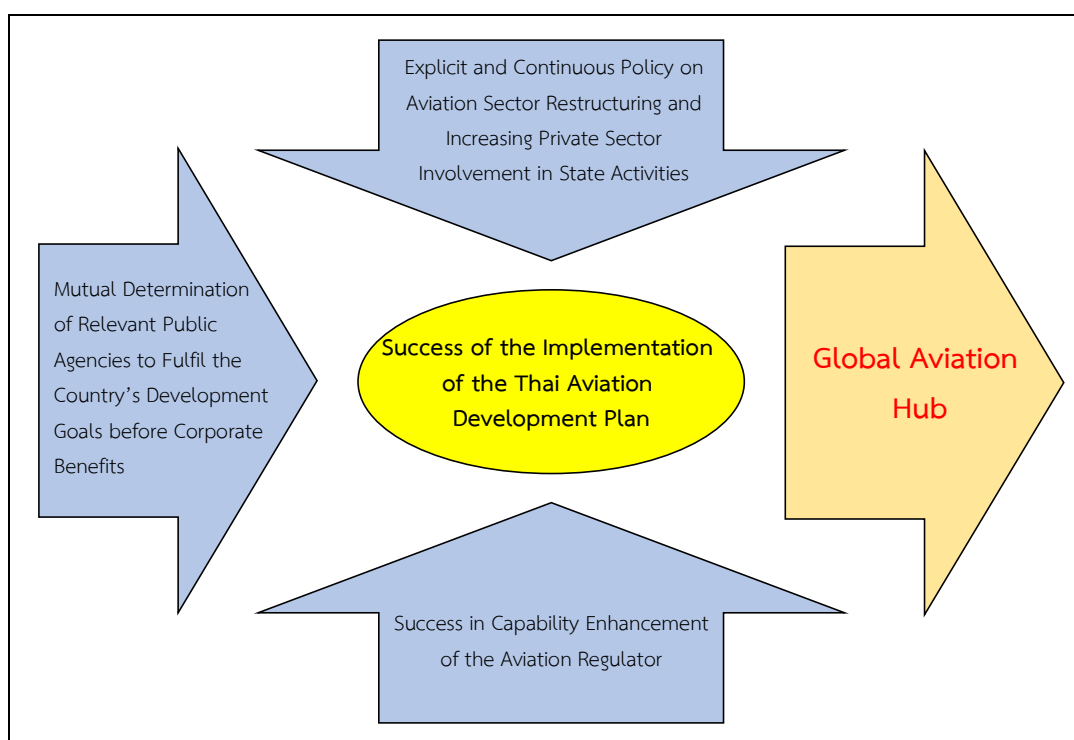
Policy Recommendations

3. Policy Recommendations

Key criteria for the success of the 15-Year Thai Aviation Development Plan (2019-2033) can be categorised into 2 parts: (i) Key Success Factors (2019-2033), and (ii) policy recommendations.

3.1 Key Success Factors for implementation of the Plan

Key success factors for upgrading Thailand to a Global Aviation Hub or a World Class Hub for Aviation Business, according to the identified vision, are the paradigm shift in operations by the concerned public agencies toward common goals, capacity enhancement in responding to the requirements of the business sector, and upgrade of safety and security standards. These key factors can contribute to the success of Thailand in becoming a Transfer Hub. At the same time, the government has to promote an investment-friendly environment and develop infrastructure in various dimensions to facilitate investors, and investment projects in the aviation business and aircraft parts manufacturing industry, which will ultimately lead the country becoming a Global Aviation Hub. Key Success Factors for the implementation of the 15-Year Thai Aviation Development Plan (2019-2033) are shown in Figure 10.



Source: Consultant

Figure 10 Key Success Factors for the 15-Year Thai Aviation Development Plan (2019-2033)

According to Figure 10, key success factors for the implementation of aviation development under the 15-years plan are:

- (i) Clarity and continuation of the government policy for the restructuring process and increase in the role of the private sector,
- (ii) the need for aviation-related agencies to prioritise overall development goals over the organisation's financial performance, and
- (iii) success in enhancing the capacity of the regulatory agency

First factor: The 15-Years Thai Aviation Development Plan (2019-2033) has set a priority for structural reform of public sector aviation agencies, targeting the common goal of pushing Thailand towards becoming a Global Aviation Hub, including the private sector's business facilitation, which is crucial to the overall mobilisation of the aviation business. Therefore, clarity and continuation of the government's policy is particularly necessary for the smooth and effective implementation of the Plan, especially the policy on free and fair competition in the aviation business, and aviation sector restructuring. Should structural reform of the public sector's aviation agencies and promotion of a stronger private sector role in aviation services be delayed, the likelihood of enhancement of the country's competitiveness will be diminished.

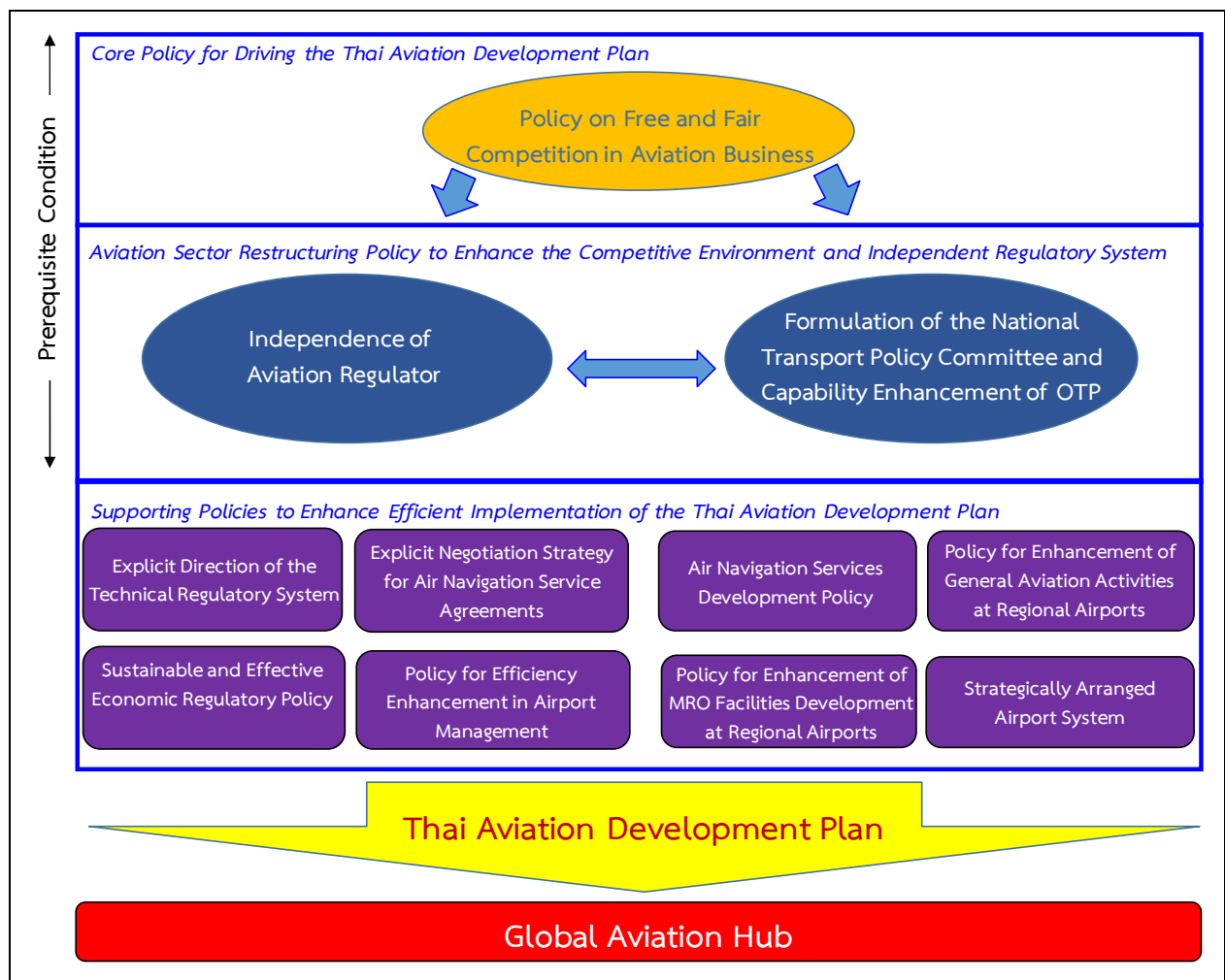
Second factor: Public sector aviation agencies, both under the Ministry of Transport and other organisations, must be integrated, and prioritise the overall development goals over organisational turnover. This will provide effective operational integration among all concerned agencies and the achievement of overall goals will ultimately contribute to the improved turnover of each agency.

Third factor: The success in enhancing the capability of the regulatory agency will ensure independence of the regulatory agency, the Civil Aviation Authority of Thailand (CAAT), from the policy makers, since the CAAT's credibility as the pillar of Thai civil aviation, and their ability to regulate aviation operations in all aspects, is crucial to the upgrading of Thai aviation to be higher than the international standard, thereby, attracting airlines and associated businesses to invest in Thailand in a sustainable manner.

3.2 Policy Recommendations

Based on the above success factors, it is necessary that the government set a priority for policy continuation. A key policy direction in the Thai Aviation Development Plan is promoting free and fair competition in the aviation business, which the government must continuously implement in order for concerned agencies to be able to efficiently, effectively and persistently adopt the Plan.

In addition to the policy on free and fair competition in the aviation business and the aviation sector restructuring, to ensure the regulator's independence from the policy makers (through establishment of the National Transport Policy Committee), both of which are considered prerequisite conditions for the Thai Aviation Development Plan, implementation of projects and measures under the 5 Development Frameworks of the Plan must be in accordance with the explicit and continuous supporting policies as highlighted in the 8 aspects shown in Figure 11. Detail of each key policy recommendation is shown in Table 10.



Source: Consultant

Figure 11 Policy Recommendations

Table 10 Key policy recommendations for explicit and continuous policy formulation for Thai Aviation Development

No.	Policy Recommendations	Detail
1	Explicit Direction of the Technical Regulatory System	- National Transport Policy Committee has to set policies that all sectors of the CAAT can coherently comply with in their operations - Rules and regulations should be set based on the said policy and in accordance with safety and security standards, which are set higher than the ICAO's - Policy on security issues must cover cyber security issue which will be crucial for future aviation security protection standards.
2	Sustainable and Effective Economic Regulatory Policy	- There is a need to explicitly set goals and scope of operation for the economic regulation of the aviation sector to prevent anticompetitive behaviours by aviation operators: - The CAAT should set clear operational direction and long-term goals for aviation economic regulations in line with the free and fair competition policy. - Clearly assign personnel responsibilities and scope of operation, e.g., airport economic regulation, price control, fair competition of airline operators, air cargo related regulations, etc.
3	Explicit Negotiation Strategy for Air Navigation Service Agreements	- The government has to set a clear position in the negotiation and/or drafting, and/or revision of air services agreements, to be in line with the aviation liberalisation policy - Other factors and possible benefits, such as tourism-related, investment revenues, and benefits resulting from labor mobilisation, should also be taken into consideration in the air services agreement negotiation
4	Policy for Efficiency Enhancement in Airport Management	- The Ministry of Transport should clearly determine its policy on airport management capacity enhancement, both for primary hub (Group 1) and secondary hub (Group 2) airports, by introducing competitive mechanisms and increasing management accountability. This can be achieved by promoting private sector investment and involvement in airport management. - The long-term role of the Department of Airports should be as an aviation market pioneer through the development of new airports, and management of regional airports (Group 3), and local airports (Group 4). - Marketing integration with the Tourism Authority of Thailand, public sector, and local private sector, and through promotion of General Aviation and MRO activities at airports with suitable business potential should be promoted. - Private sector investment and management should be encouraged at airports currently under the management of the Department of Airports, which have been upgraded to secondary hub airports (Group 2) and regional airports (Group 3), and have a high volume of flights and passengers. This is in order to be able to respond to the need of the business sector and airport users in an efficient manner, and alleviate the financial burden on the Department of Airports. - AOT should take on a role of an airport operator with efficient services on a par with international standards. If AOT plans to expand its scope of operations to any regional airport, which is currently under the Department of Airports, it will need to comply with relevant legal processes under the policy on free and fair competition in the aviation business.

Table 10 Key policy recommendations for explicit and continuous policy formulation for Thai Aviation Development (Continued)

No.	Policy Recommendations	Detail
5	Air Navigation Services Development Policy	- The need for a clear policy on long-term development of air navigation services for enhancing national air traffic capacity. - The National Transport Policy Committee should urgently develop: - a national air navigation services policy, and - an air navigation services development plan, in accordance with Strategic Issue Aviation System Block Upgrades (ASBU), and the Asia/Pacific Seamless ATM Plan which are international standard development frameworks.
6	Policy for Enhancement of MRO Facilities Development at Regional Airports	- The Ministry of Transport should promote the use of areas at regional airports, especially regional airports (Group 3) and local airport (Group 4), for development of aircraft maintenance and parts maintenance centres, which will increase domestic demand for aircraft maintenance that can support a wider range and higher number of aircraft. - Potential airports for the establishment of MRO centres for aircraft and aircraft parts (which should be studied in further detail) include (i) U-Tapao (Rayong - Pattaya), (ii) Mae Fah Luang Chiang Rai, (iii) Nakon Ratchasima, (iv) Sakon Nakhon, (v) Trang, (vi) Pitsanulok, and (vii) Surat Thani (although Pitsanulok and Surat Thani Airports may have usage limitation due to present air force flight training).
7	Policy for the Enhancement of General Aviation Activities	- The Ministry of Transport should set a policy to promote private participation and investment in the development of General Aviation and Business Aviation, and establishment of flying and aviation technical training schools at unused areas of regional airports (especially Group 2 and Group 3). Contracts should be agreed on a long-term basis. - Promotion of General Aviation will enhance the experience of the aviation human resource pool, especially pilots and aviation technicians, enabling them to accumulate sufficient operating hours to meet the requirements for working in the commercial airline business.
8	Strategically Arranged Airport System	- Airports are categorised based on the CAAT's criteria, which has been approved by the Civil Aviation Board (CAB), that is, - primary hub airports, - secondary hub airports, - regional airports, and - local airports. The number of airports in each category may change each year due to an increase of passenger numbers. - should airport categorisation be reviewed in the future, new criteria should be set to take into consideration the government's area-based development strategies, ensuring that airport categorisation clearly reflects the government's long-term integrated development policy.

Source: Consultant

Appendix A

Planned Projects/Measures under the 15-Year Thai Aviation Development Plan (2019-2033)

Appendix A Planned Projects/Measures under the 15-Year Thai Aviation Development Plan (2019-2033)

Table A-1 Planned Projects/Measures under Development Framework 1 - Airports Development

No.	Development Framework/ Component/ Strategy / Project/Measures	Details	Timeframe	Total investment (million Baht)	Year																		Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033				
Development Framework 1 - Airports Development																							
Framework Component 1.1 - Capacity and utilisation enhancement of airports																							
Strategy 1 - Enhancing capacity of primary hub airports (Group 1) and secondary hub airports (Group 2) to accommodate flights, passengers and cargo																							
Projects																							
1	Development of Suvarnabhumi Airport (Phase 2)	- Objective: To increase capacity to accommodate passenger volume, as well as mitigate the congestion of increasing passenger volume and the numbers of flights at Suvarnabhumi Airport - Key Tasks: Construction of a secondary concourse and related infrastructure (continuous project plan by Airports of Thailand Public Company Limited from 2018) - Goal: Increased capacity of Suvarnabhumi Airport to accommodate 60 million passengers per year	2019 - 2021 (3 years)	62,504.0*																	• Airports of Thailand Public Company Limited		
2	Development of Don Mueang International Airport (Phase 3)	- Objective: To restore the capacity of Don Mueang International Airport and develop it to its full potential. - Key Tasks: Demolition and expansion of terminals and the development of facilities to transport passengers between air and ground modes in the most efficient way with an ability to connect to the rail transport system (continuous project plan by Airports of Thailand Public Company Limited from 2018) - Goal: To increase the capacity of Don Mueang International Airport to accommodate 40 million passengers per year	2019 - 2024 (6 years)	37,590.0*																	• Airports of Thailand Public Company Limited		
3	Development of Chiang Mai International Airport (Phase 1)	- Objective: To increase the capacity through developing facilities and infrastructure to accommodate increasing air traffic volume that will occur up until 2025 - Key Tasks: Design and construction of buildings and related infrastructure (continuous project plan by Airports of Thailand Public Company Limited from 2018) - Goal: To increase the capacity of Chiang Mai International Airport to accommodate increasing air traffic up until 2025, which will accommodate no less than 16.5 million passengers per year	2019 - 2022 (4 years)	15,820.0*																	• Airports of Thailand Public Company Limited		
4	Feasibility study for the construction of new regional airports	- Objective: To be utilised as a development framework, with options between improvement and development of existing airport management services at airports with high congestion, or the construction of new airports to ensure sustainable expansion of aviation services - Key Tasks: 1) Undertake a comparative study between increasing the capacity of congested airports, particularly airports in the secondary hub airports (Group 2) category, which have physical limitations to their expansion, such as airports in Chiang Mai, Phuket, etc., and the construction of new airports in nearby areas and provinces that have a high potential for their economy and tourism. 2) Using the result of 1) to conduct a feasibility study focusing on engineering, financial, economic, PPP and environmental impact issues. - Goal: This is aimed at comparing benefits and effects of new airport development, as well as investment options, in order for the government to make its strategic decision.	2020 - 2022 (3 years)	200.0																	Primary agencies: • Department of Airports Supporting agencies: • Office of Transport and Traffic Policy and Planning		
5	Feasibility study for the establishment of a fund to support the use of advanced technology for relevant government agencies	- Objective: To study the feasibility and approach to the establishment of a fund for the procurement and maintenance of equipment for various services at primary hub airports (Group 1) and secondary hub airports (Group 2), using advanced technology - Key Tasks: A feasibility study to explore options to allocate revenue from the Passenger Service Charge to a fund for the procurement and maintenance of equipment providing various services in the airport using advanced technology, such as 1) aeronautical meteorology (Bureau of Aeronautical Meteorology, Meteorology Department), such as radar, weather monitor, etc., 2) immigration process (Immigration Office, Royal Thai Police) such as passport checking devices, etc., 3) customs clearance service (Customs Department) such as cargo scanning - Goal: To have a clear development framework for the establishment of a fund to support the use of advanced technology for relevant government agencies	2021 (1 year)	30.0																	Primary agencies: • Office of Transport and Traffic Policy and Planning Supporting agencies: • Department of Airports • Airports of Thailand Public Company Limited • Civil Aviation Authority of Thailand • Meteorology Department • Immigration Bureau • Customs Department		

Table A-1 Planned Projects/Measures under Development Framework 1 - Airports Development (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																	Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033			
Development Framework 1 - Airports Development (continued)																						
Framework Component 1.1 - Capacity and utilisation enhancement of airports (continued)																						
Strategy 1 - Enhancing capacity of primary hub airports (Group 1) and secondary hub airports (Group 2) to accommodate flights, passengers and cargo (continued)																						
Projects (continued)																						
6	Establishment of a fund to support the utilisation of advanced technology for relevant government agencies at airports	- Objective: To establish a fund for purchasing and maintaining equipment that helps provide various services at primary hub airports (Group 1) and secondary hub airports (Group 2) - Key Tasks: Establishment of a fund for purchasing and maintaining equipment for various services at airports which require advanced technology, through the allocation of revenue from the Passenger Service Charge, particularly in the following areas: 1) Aviation Meteorology (Bureau of Aeronautical Meteorology, Meteorology Department) 2) immigration process (Immigration Office, Royal Thai Police) 3) cargo clearance (Customs Department) - Goal: For various government agencies at primary hub airports (Group 1) and secondary hub airports (Group 2) to be sufficiently and efficiently equipped with high-tech devices as well as having a standardized and systematic maintenance process	2022 - 2023 (2 years) (Implementation)	20.0																	Primary agencies: • Department of Airports • Airports of Thailand Public Company Limited Supporting agencies: • Civil Aviation Authority of Thailand • Meteorology Department • Immigration Bureau • Customs Department	
7	Feasibility study for increasing capacity at regional airports (Group 3), which can be developed into second hub airports (Group 2)	- Objective: To undertake a feasibility study for the renovation of infrastructure and the management systems at regional airports (Group 3), where the passenger volume and quantity of flights are expected to increase to a level that will qualify them as secondary hub airports (Group 2), in a bid to support the projected traffic growth rates for passengers and air cargo in the future - Key Tasks: A study of the engineering, financial, economic, investment and environmental feasibility for increasing the capacity of highly congested regional airports (Group 3) in a bid to accommodate more flights, passengers and cargo in the future - Goal: To utilise the study as supporting material when requesting approval for implementation from relevant agencies	2024 - 2025 (2 years)	200.0 (Estimation for AOT and DOA)																	• Department of Airports • Airports of Thailand Public Company Limited	
Measures																						
1	Defining key performance indicators (KPIs) for relevant agencies and their executives based on the performance of airport development	- Objective: To ensure successful and timely implementation of the development plans of the Department of Airport and Airports of Thailand Public Company Limited - Key Tasks: Defining KPIs for agencies and their executives, based on the Level of Service at airports, or the level of capacity that exceeds demand for airport usage, including elements such as runways, taxiways, aircraft parking stands, passenger terminals, parking areas, mass transit connections, etc. - Goal: Utilisation of established KPIs to create accountability in developing airports that are in line with the growth of business aviation	2019 - 2033 (15 years)	-																	Primary agencies: • Ministry of Transport (National Transport Policy Committee) Supporting agencies: • Civil Aviation Authority of Thailand • Department of Airports • Airports of Thailand Public Company Limited	
2	Promoting development of Smart Airports to maximise passenger comfort and convenience	- Objective: To utilise digital technologies for Airport User Interfaces to attract international business aviation to use services at the airports with high potential, as well as supporting the country to become a key destination and connection hub in the region - Key Tasks: Study of utilisation of advanced technology for Airport User Interfaces at primary hub airports (Group 1) and secondary hub airports (Group 2) - Goal: Develop the study into an action plan to utilise advanced technology for Airport User Interfaces in the airports with high potential, as well as planning to increase the number of passengers in relation to the investment in such technology	2019 - 2028 (10 years)	-																	• Airports of Thailand Public Company Limited • Department of Airports • U-Tapao Airport (Royal Thai Navy)	

Table A-1 Planned Projects/Measures under Development Framework 1 - Airports Development (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year															Responsible agencies	
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033		
Development Framework 1 - Airports Development (continued)																					
Framework Component 1.1 - Capacity and utilisation enhancement of airports (continued)																					
Strategy 2 - Optimising utilisation of regional airports (Group 3) and local airports (Group 4)																					
Projects																					
1	Study of the management approach for regional airports (Group 3) and local airports (Group 4) to enhance capacity and utilisation of domestic routes	- Objective: To determine an approach to increase utilisation of regional airports (Group 3) and local airports (Group 4), which have low traffic density, by promoting an effective management approach and the strategy for the opening up of the aviation market and related businesses - Key Tasks: 1) Study of the management approach for regional airports (Group 3) and local airports (Group 4), which have low traffic density, by defining a contract management strategy, in a clear and effective manner, for supervision of quality of service and fees, as well as safety and security standards 2) Study of the opening up of the aviation market and related businesses to maximise the capacity at airports - Goal: Study results that can be utilised as concrete strategies to improve the efficiency in management of regional airports (Group 3) and local airports (Group 4), and to increase business opportunities for the Department of Airports in a bid to expand airport traffic and other related businesses	2020 - 2021 (2 years)	40.0																	• Department of Airports
2	Promoting the development of the domestic route network to open up the aviation market in new provinces	- Objective: To establish a domestic route network in high-potential provinces by developing new local airports (Group 4) in a bid to open up new regional aviation markets in the country - Key Tasks: 1) A study of the domestic route network to identify and develop new local airports (Group 4) to open up new regional aviation markets in the country 2) Preparation of a domestic route network plan for the Department of Airports, to be included in its development plan 3) A study to determine approaches for attracting passengers to new domestic routes by collaborating with relevant agencies in tourism and public transport - Goal: Study results that define a strategic direction for each route that promotes the development of the domestic route network and regional airports by focusing on collaborating with relevant agencies on a definite timeline	2025 - 2027 (3 years)	80.0																	• Department of Airports
Measures																					
	-	-	-	-																-	
Strategy 3 - Developing a mechanism to control utilisation of land around airports in a bid to prevent environmental impacts on communities and accommodate future expansion of airports																					
Projects																					
1	A study to formulate a planning and operating framework for environmental impact management applicable to the Department of Airports’ regional airports	- Objective: To formulate an environmental management plan applicable to the Department of Airports’ regional airports - Key Tasks: To formulate an action plan for environmental quality management applicable to the Department of Airports’ regional airports, in a bid to prevent environmental impacts in all aspects. The action plan needs to be reviewed on a regular basis to keep up with the current situation. - Goal: An explicit airport environmental management plan, which is responsive and will address environmental problems at airports and will enable related agencies to operate in an efficient manner.	2019 - 2023 (4 years)	50.0																	• Department of Airports

Table A-1 Planned Projects/Measures under Development Framework 1 - Airports Development (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year														Responsible agencies	
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032		2033
Development Framework 1 - Airports Development (continued)																				
Framework Component 1.1 - Capacity and utilisation enhancement of airports (continued)																				
Strategy 3 - Developing a mechanism to control utilisation of land around airports in a bid to prevent environmental impacts on communities and accommodate future expansion of airports (continued)																				
Projects (continued)																				
2	Study of a developing mechanism to control the utilisation of land around airports in a bid to prevent environmental impacts on communities and accommodate future expansion at airports	- Objective: to develop a mechanism to control the utilisation of land around airports - Key Tasks: A study to identify a legal and enforceable development framework, that includes a mechanism to control the utilisation of land around airports, to prevent environmental impacts on communities and accommodate future expansion at airports - Goal: Study results for improving legislation to develop a clear mechanism to control the utilisation of land around airports	2021 - 2022 (2 years)	30.0																Office of Transport and Traffic Policy and Planning
3	A study of the utilisation of land around primary hub airports (Group 1)	- Objective: To determine a development framework for the utilisation of land around primary hub airports (Group 1) - Key Tasks: A study to prepare a plan to accommodate the future expansion of primary hub airports (Group 1), which will reach their full capacity, including a study of the expansion of infrastructure, such as runways, taxiways, aircraft parking stands, passenger terminals and other facilities - Goal: Study results for a clear development framework for the utilisation of land around primary hub airports (Group 1), as well as the expansion of infrastructure, such as runways, taxiways, aircraft parking stands, passenger terminals and other facilities	2021 (1 year)	30.0																Office of Transport and Traffic Policy and Planning
4	A study of the utilisation of land around secondary hub airports (Group 2), regional airports (Group 3) and local airports (Group 4)	- Objective: To study the utilisation of land around secondary hub airports (Group 2), regional airports (Group 3) and local airports (Group 4) - Key Tasks: A study to prepare a plan for the future expansion of airports, when the demand for transport and logistics increases, including the expansion of infrastructure such as runways, taxiways, aircraft parking stands, passenger terminals and other facilities - Goal: Study results for a clear development framework for the utilisation of land around secondary hub airports (Group 2), regional airports (Group 3) and local airports (Group 4) to plan the utilisation of land in a systematic manner	2023 - 2024 (2 years)	50.0																Office of Transport and Traffic Policy and Planning
Measures																				
	-	-	-	-																-
Framework Component 1.2 - Promoting competition in airport management and airport related services																				
Strategy 1 - Promoting a customer-oriented culture at airports																				
Projects																				
1	A study for performance improvement of airport services in order to cut unnecessary costs for agencies using the services	- Objective: To mitigate the cost burden through improvement of internal processes, in a bid to increase the opportunities for improvement of services for airlines, passengers and cargo providers at primary hub airports (Group 1) and secondary hub airports (Group 2) and regional airports (Group 3), the latter which have a high potential to be upgraded to Group 2 in the future - Key Tasks: 1) To consider the utilisation of technology in airport services under the supervision of AOT and the DOA, in order to increase efficiency and reduce unnecessary costs for the users 2) To determine a management framework that will reduce unnecessary costs in airport services under the supervision of AOT and the DOA 3) To organize customer-oriented training for the relevant executives and staff - Goal: Reduced waiting times for services for passengers and cargo providers, as measured by survey results of passengers, cargo providers and agencies using the services	2020 - 2023 (4 years)	100.0 (Estimation for AOT and DOA)																- Airports of Thailand Public Company Limited - Department of Airports
2	A study of the billing system for airport services	- Objective: To simplify and reduce the cost of management for airlines and relevant airport service users by integrating the billing system for each airport service, particularly for primary hub airports (Group 1), secondary hub airports (Group 2) and regional airports (Group 3), the latter which have a high potential to be upgraded to Group 2 in the future - Key Tasks: A study of a unified billing system for airport service fees and other related charges - Goal: To improve efficiency and reduce costs for airlines, passengers and cargo providers. The study results will be utilised in a development framework for Airports of Thailand Public Company Limited, the Department of Airports and other private service providers	2022 (1 year)	40.0																Office of Transport and Traffic Policy and Planning

Table A-1 Planned Projects/Measures under Development Framework 1 - Airports Development (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																	Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033			
Development Framework 1 - Airports Development (continued)																						
Framework Component 1.2 - Promoting competition in airport management and airport related services (continued)																						
Strategy 1 - Promoting a customer-oriented culture at airports (continued)																						
Projects (continued)																						
3	Airport Operation & Management System for the DOA's regional airports	- Objective: To implement an Airport Operation & Management System for the DOA's regional airports in order to optimize resources and information services for airlines/operators/service users, and to promote the image of the DOA's regional airports as up-to-date service providers. - Key Tasks: To acquire an Airport Operation & Management System, which consists of (i) airport operations database management system, (ii) airport resources management system, (iii) flight information display system, (iv) passenger information monitoring system, and (v) invoicing system for utilised resources and services at the airports - Goal: An efficient central information system for airport operation and management for the DOA's regional airports	2019-2023 (4 years)	250.0																	• Department of Airports	
Measures																						
1	Call for all airports to prepare an Airport Development Plan	- Objective: Every airport to have a long-term development plan in a bid to accommodate future growth and increasing demand in an efficient manner - Key Tasks: Request every airport to prepare a development plan that includes the following aspects: (1) Air-side and land-side development, such as runways, taxiways, aircraft parking stands, passenger terminals, parking areas, etc., as well as the management of the airfield and other facilities. (2) Development of inter-city transport systems, including both public transport and mass transit networks (3) Information technology systems (4) Non-aviation activity to generate additional income for the airport (5) Development of personnel at the airport (6) Environmental management at the airport In this regard, the plan should be reviewed regularly and revised accordingly. The master plan for each airport must be approved by the National Transport Policy Committee prior to implementation - Goal: Every airport has their development plan	2019 -2033 (15 years)	-																	• Airports of Thailand Public Company Limited • Department of Airports • Privately owned airport operators	
2	Promoting non-aviation activity management at regional airports, under control of AOT and the DOA, to attract private sector investment	- Objective: To encourage agencies, both AOT and the DOA, to commercialise unused or underutilised areas by attracting more investment from the private sector in order to help generate revenue for the airports and reduce the cost burden for the government - Key Tasks: 1) To accelerate and promote private sector investment in non-aviation activities at airports, as well as other activities for mutual benefits, such as the utilisation of unused areas inside airports as solar farms to generate electricity. 2) To attract private sector investment by reducing fees and charges and organising a pilot project to identify appropriate investment opportunities - Goal: An increasing number of private sector investors investing in non-aviation activity at airports every year, which is to be published in airport's annual reports, together with a strategy to attract more private investors through a pilot project	2019 -2033 (15 years)	-																	• Airports of Thailand Public Company Limited • Department of Airports	
Strategy 2 - Enhancing private sector's role in management of regional airports																						
Projects																						
1	A study to enhance private sector's role in management of regional airports (Group 3) which have high potential	- Objective: To reduce the financial burden on the Department of Airports, as well as to improve airport services based on the principle of good governance and a free trade policy - Key Tasks: A study to set strategies and formats for private sector investment in airport management or activities within regional airports (Group 3), including a study of other legal requirements and a development framework for supervision of airport services - Goal: A study to support a request for approval from the Cabinet for the Department of Airports to implement accordingly	2020 (1 year)	40.0																	• Department of Airports	
2	A study to create a competitive mechanism and enhance the role of the private sector in providing air traffic services at secondary hub airports (Group 2), and regional airports (Group 3)	- Objective: To increase Aerodrome efficiency based on the principle of good governance and a free trade policy - Key Tasks: A study to set strategies for competitive mechanisms to increase Aerodrome efficiency and research on joint private sector investment in airport services, by focusing on secondary hub airports (Group 2), and regional airports (Group 3), due to their high traffic potentials and high return on investment in advanced technology. This should also include a study of other legal requirements and a development framework for supervision of airport services - Goal: A study to support a request for approval from the Cabinet for the relevant agencies to implement accordingly	2020 (1 year)	30.0																	Primary agencies: • Department of Airports • Airports of Thailand Public Company Limited Supporting agencies: • Civil Aviation Authority of Thailand	

Table A-1 Planned Projects/Measures under Development Framework 1 - Airports Development (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																		Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033				
Development Framework 1 - Airports Development (continued)																							
Framework Component 1.2 - Promoting competition in airport management and airport related services (continued)																							
Strategy 2 - Enhancing the private sector’s role in management of regional airports (continued)																							
Measures																							
1	Enhancing the private sector’s role in the management of regional airports (Group 3)	- Objective: To reduce the financial burden on the Department of Airports, as well as to improve airport services based on the principle of good governance and a free trade policy - Key Tasks: Implementation of private sector investment in airport management or activities within regional airports (Group 3), based on the study. The Department of Airports will be responsible for supervising the private sector investment in accordance with the PPP agreement - Goal: Having the private sector managing regional airports (Group 3) under the Department of Airports or undertake other activities to improve airport services and generate dividend income for the Department of Airports.	2020 - 2033 (13 years)	-																	• Department of Airports		
2	Enhancing the private sector’s role in providing air traffic services at secondary hub airports (Group 2), and regional airports (Group 3)	- Objective: To increase efficiency of Aerodrome management services, of which Aeronautical Radio of Thailand Ltd. is the sole service provider, by implementing competitive mechanisms for the private sector to compete on the basis of good governance and a free trade policy - Key Tasks: Implementation of competitive mechanisms to increase efficiency of Aerodrome management services by opening up the market for the private sector to invest in the provision of services at secondary hub airports (Group 2), and regional airports (Group 3), which have high traffic potentials and high returns on investment - Goal: Having the private sector compete and provide Aerodrome management services with equal or higher standards than the existing operations provided by Aeronautical Radio of Thailand Ltd.	2021 - 2033 (13 years)	-																	Primary agencies: • Department of Airports • Airports of Thailand Public Company Limited Supporting agencies: • Civil Aviation Authority of Thailand		
Framework Component 1.3 - Development of the transport systems connecting airports and surrounding urban areas																							
Strategy 1 - Developing transport systems that match the demand for traveling in and out of airports, in order to enhance capacity of airport linkages to the cities																							
Projects																							
1	Development of mass transit systems between the cities and Chiang Mai and Phuket airports	- Objective: To accommodate passengers who travel from the airports to the cities - Key Tasks: Development of mass transit systems connecting the airports and the cities to accommodate passengers traveling to their destinations - Goal: Mass transit systems connecting the cities and Chiang Mai and Phuket airports	2020 - 2027 (8 years)	113,400.0**																	Primary agencies: • Mass Rapid Transit Authority of Thailand Supporting agencies: • Office of Transport and Traffic Policy and Planning • Airports of Thailand Public Company Limited • Local government agencies		
2	Feasibility study for the development of mass transit systems and public transport connecting the cities and secondary hub airports (Group 2) and regional airports (Group 3)	- Objective: To accommodate passengers who travel from the airports to the cities - Key Tasks: Feasibility study of public transport systems connecting the airports and the cities in the regions in a bid to accommodate passengers traveling to their destinations and encouraging the private sector or local agencies to invest in their management - Goal: Study results that lead to formulating clear policies on the type of service provision, management, financial support and organisational structure	2022 - 2023 (2 years)	50.0																	Primary agencies: • Office of Transport and Traffic Policy and Planning Supporting agencies: • Department of Airports • Airports of Thailand Public Company Limited • Local government agencies • Mass Rapid Transit Authority of Thailand		
3	A study of the impact of High-speed Rail on air travel and the aviation business	- Objective: To utilise a policy-making process for the future development of airports - Key Tasks: The analysis of passengers’ changing travel habits, the impact on number of passengers, as well as the impact on airlines and airport services, particularly on domestic routes, resulting from the implementation of a high-speed rail system - Goal: The analysis results of passengers’ changing travel habits and the impact on airlines and airport services resulting from a high-speed rail system	2027 (1 year)	25.0																	• Office of Transport and Traffic Policy and Planning		
Measures																							
	-	-	-	-																	-		

Table A-1 Planned Projects/Measures under Development Framework 1 - Airports Development (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year															Responsible agencies	
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033		
Development Framework 1 - Airports Development (continued)																					
Framework Component 1.3 - Development of the transport systems connecting airports and surrounding urban areas (continued)																					
Strategy 2 - Developing traffic management systems within and around airport areas to alleviate congestion and reduce air pollution																					
Projects																					
1	The study of traffic management systems within and around primary hub airports (Group 1) and secondary hub airports (Group 2) to alleviate congestion in and out of airports	- Objective: To analyse the problems and determine strategies and measures to alleviate congestion in and out of primary hub airports (Group 1) and secondary hub airports (Group 2) - Key Tasks: The analysis of the demand for traveling in and out of airports, as well as the utilisation of public transport systems in various ways to determine strategies and measures for traffic management systems. It should also include suggestions on construction of infrastructure such as roads and interchanges accordingly - Goal: Study results that will lead to determining clear and concrete strategies and measures for traffic management and future construction requirements	2023 -2026 (4 years)	100.0																Primary agencies: • Office of Transport and Traffic Policy and Planning Supporting agencies: • Department of Airports • Airports of Thailand Public Company Limited • Local government agencies	
2	The study of the improvement of areas within airports (Group 3 and Group 4) that can accommodate public transport services	- Objective: To determine strategies for managing public transport services at airports in an efficient manner to accommodate the anticipated number of passengers - Key Tasks: 1) A study to speed up the implementation of public transport services management, such as setting parking points or granting permits to operate at airports nationwide 2) The study is to consider the alternatives for determining public bus services between the airports and cities for airports nationwide 3) A preliminary study for improvement areas within the airports to accommodate public transport connections - Goal: Study results that will lead to a policy to manage public transport services at the airports and prioritizing implementation at airports within a given time frame	2020 - 2025 (6 years)	100.0																	• Department of Airports • Airports of Thailand Public Company Limited
Measures																					
1	Collaboration with local traffic management to define strategies for parking areas, pick up & drop off areas at airports	- Objective: To facilitate traveling in and out of the airports, support linkages between the airports and the cities, by setting clear traffic management strategies, and taking the opinions of local agencies into consideration - Key Tasks: To promote discussion at the local level to determine traffic management strategies at primary hub airports such as in Phuket and Chiang Mai - Goal: Clear policies on service lines, parking areas, and pick up & drop off areas at the airports	2020 - 2033 (14 years)	-																	• Airports of Thailand Public Company Limited • Department of Airports • Local agencies
Framework Component 1.4 - Improving airport security standards																					
Strategy 1 - Creating a security culture and acquiring sufficient personnel and security devices for strict security measures																					
Projects																					
1	Organising training to create awareness and a culture of airport security	- Objective: To provide training for personnel in security agencies, airports and immigration agencies to provide alignment of security measures - Key Tasks: Organising activities to enhance the understanding of: 1) Security systems and principles 2) Responsibilities, according to the National Civil Aviation Security Program (NCASP), that can be put into practice - Goal: Relevant agencies, at both public and private airports, have sufficient personnel who understand security measures and will promote a security culture	2020 - 2033 (14 years)	6.0 per year A total of 84.0																	Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Department of Airports • Airports of Thailand Public Company Limited • Immigration Bureau • Customs Department
2	Public relations to change people's attitudes toward security	- Objective: For agencies and users to have the right mindset toward security - Key Tasks: Organising activities and publicity that promotes security awareness - Goal: Airport users and public agencies strictly and equally comply with security processes	2020 - 2033 (14 years)	9.0 per year A total of 126.0																	Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Department of Airports • Airports of Thailand Public Company Limited • Privately owned airport operators

Table A-1 Planned Projects/Measures under Development Framework 1 - Airports Development (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																	Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033			
Development Framework 1 - Airports Development (continued)																						
Framework Component 1.4 - Improving airport security standards (continued)																						
Strategy 1 - Creating a security culture and acquiring sufficient personnel and security devices for strict security measures (continued)																						
Projects (continued)																						
3	Training to use security devices and implement measures	- Objective: To ensure that personnel using security devices have sufficient knowledge and training to use them safely and efficiently - Key Tasks: Create a better understanding by users of how to use accurate security devices and review related practices - Goal: An efficient use of security devices and reduction in delays at security checkpoints	2020 - 2033 (14 years)	8.0 per year. A total of 112.0																• Department of Airports • Airports of Thailand Public Company Limited		
4	Establishment of Airport Operations Training Centres	- Objective: To provide training to support airport operations at regional airports - Key Tasks: Acquiring sufficient personnel, including security staff, to accommodate increasing air traffic and passengers - Goal: Establishment of Airport Operations Training Centres	2020 - 2023 (4 years)	15.0																• Department of Airports • Airports of Thailand Public Company Limited		
Measures																						
1	Improving security measures	- Objective: To ensure that international security standards are met - Key Tasks: Improving security measures and procedures to be in accordance with airport physical layouts - Goal: All aspects of airport security measures are implemented	2019 - 2020 (2 years)	-																Primary agencies: • Department of Airports • Airports of Thailand Public Company Limited Supporting agencies: • Civil Aviation Authority of Thailand		
2	Implementing airport security screener certificate	- Objective: To implement a mechanism to certify airport security screeners according to the ICAO's standards. - Key Tasks: Member states are required to have certified airport security screeners according to the ICAO's standards - Goal: An airport security screener certification system is implemented	2019 (1 year)	-																• Civil Aviation Authority of Thailand		
Strategy 2 - Improving security standards and the capacity of inspection and security measures																						
Projects																						
1	Preparation and updating of airport security programs for primary hub airports (Group 1) and secondary hub airports (Group 2) and operators	- Objective: To create/update security plans at Airports (Airport Security Programs) and Air Operator Security Programs (AOSP), in accordance with the National Civil Aviation Security Program (NCASP) - Key Tasks: The NCASP is the national civil aviation program implemented by the Civil Aviation Authority of Thailand in 2018, to ensure that airport operations and relevant businesses have security programs - Goal: Airport authorities and relevant agencies will develop airport security programs according to the NCASP	2020 - 2023 (4 years)	20.0																Primary agencies: • Department of Airports • Airports of Thailand Public Company Limited Supporting agencies: • Various airport service providers		
2	Improve the physical layouts of airport security at secondary hub airports (Group 2)	- Objective: To ensure the physical layouts of airports are compliant with security standards - Key Tasks: Some airports have physical layouts that don't follow security standards, such as fencing, CCTV systems, lighting, etc. - Goal: Every airport will have a physical layout compliant with security standards	2020 - 2022 (3 years)	300.0																• Department of Airports • Airports of Thailand Public Company Limited		
3	Improvement of security devices at secondary hub airports (Group 2)	- Objective: To upgrade and increase the efficiency of airport security devices - Key Tasks: Investment, procurement and maintenance of security devices at every commercial airport to international levels, to accommodate an increasing number of passengers and luggage - Goal: Advanced safety devices are set up at airports	2020 - 2025 (6 years)	550.0																• Department of Airports • Airports of Thailand Public Company Limited		
Measures																						
	-	-	-	-																-		

Table A-1 Planned Projects/Measures under Development Framework 1 - Airports Development (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																	Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033			
Development Framework 1 - Airports Development (continued)																						
Framework Component 1.4 - Improving airport security standards (continued)																						
Strategy 3 - Improving the risk assessment system for security procedures																						
Projects																						
1	To update the security management system’s database for airports	- Objective: To ensure the security management system’s database can support risk assessments and long-term development - Key Tasks: Security management system’s database is established that can support risk assessments and future upgrades - Goal: An up-to-date security management system’s database	2020 - 2021 (2 years)	30.0																	Primary agencies: • Department of Airports • Airports of Thailand Public Company Limited Supporting agencies: • Civil Aviation Authority of Thailand	
Measures																						
1	Collaboration among airport security agencies	- Objective: To promote collaboration, cooperation and sensitive information sharing - Key Tasks: Airport security agencies are able to share critical security information associated with unlawful acts, as well as collaboration in policy-making and operations - Goal: Collaboration system, cooperation framework and effective channels for information exchange	2019 - 2020 (2 years)	-																	Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Department of Airports • Airports of Thailand Public Company Limited • Privately owned airport operators	
2	Preparation of a security level adjustment mechanism	- Objective: To provide a mechanism to respond to security threats in a timely manner, which can be adjusted accordingly - Key Tasks: Threats to security can occur at any time; therefore, airports must have a mechanism to respond accordingly - Goal: A security level adjustment mechanism to respond to security threats accordingly	2019 (1 year)	-																	Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Department of Airports • Airports of Thailand Public Company Limited • Privately owned airport operators	
Framework Component 1.5 - Development of airports for general aviation activities																						
Strategy 1 - Developing General Aviation Airports																						
Projects																						
1	Feasibility study to allow private investment in the development and administration of airports for general aviation	- Objective: To undertake a feasibility study for allowing the private sector to invest in the development and administration of airports for general aviation in accordance with the Act Governing Private Sector Participation in, or Operation of, the State Activities B.E. 2556 (2013) - Key Tasks: Feasibility study of engineering, business and economic development, finance and investment patterns for general and business aviation - Goal: Study results that are aligned with the requirements of the Act Governing Private Sector Participation in, or Operation of, the State Activities B.E. 2556 (2013), to request the cabinet’s approval for the Department of Airports to proceed accordingly	2020 (1 year)	30.0																	• Department of Airports	
2	Allowing private investment in the development and administration of airports for general aviation	- Objective: To select private entities to invest in the development and administration of airports for general aviation in accordance with the Act Governing Private Sector Participation in, or Operation of, the State Activities B.E. 2556 (2013) - Key Tasks: The announcement and selection of potential private entities to invest in the development and administration of airports for general aviation in accordance with the feasibility study’ results of engineering, business and economic development, finance and investment patterns, as well as the organisation of land ownership for airport construction - Goal: The Department of Airports will cooperate with private entities to implement airport services for general aviation at, at least 1 airport	2021 - 2024 (4 years)	9,400.0***																	• Department of Airports	
Measures																						
	-	-	-	-																	-	

Remarks: * Budget under AOT’s plan
** Budget (i) of 39,400 million Baht for mass transit system project in Phuket and (ii) of 74,000 million Baht for mass transit system project in Chiang Mai
*** Budget of 9,400 million Baht for establishment of airport to support Business Aviation Airport (Feasibility study of the establishment of the airport to accommodate Business Aviation Airport, 2018)
■■■■■ indicated on-going operations to achieve long term goal

Source: Analysed by Consultant

Table A-2 Planned Projects/Measures under Development Framework 2 - Promoting Airlines and Supporting Businesses

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																	Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033			
Development Framework 2 - Promoting Airlines and Supporting Businesses																						
Framework Component 2.1 - Promoting and facilitating the airline business and its supporting businesses in Thailand																						
Strategy 1 - Improving concerned public sector mechanisms to enhance operational flexibility in the airline business and other supporting businesses, and enhancing the competitiveness of business operators																						
Projects																						
1	Enhancing the capacity of the aviation businesses, regulatory regime and services for aviation business operators	- Objective: To build understanding between aviation operators, supported businesses and government officials regarding the laws and regulations, to increase efficiency in providing and receiving services for data and permits - Key Tasks: Enhancing the capacity through the training of airline operators and supporting businesses (focusing on businesses with a large number of operators) on related laws, regulations and licensing, in a bid to create a common understanding on laws and regulations enforced by the Civil Aviation Authority of Thailand - Goal: To provide training in aviation law 4 times a year, for 2 consecutive years, together with training for the Civil Aviation Authority of Thailand’s officials on providing services to aviation operators at least once a year, for 2 consecutive years (all training should then be evaluated and revised accordingly)	2020 - 2021 (2 years)	5.0																	Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Business sector representatives, i.e., Board of Airline Representatives Business Association (BAR), Airline Operators Committee (AOC), Thai Airfreight Forwarders Association (TAFA), and Airline Cargo Business Association (ACBA)	
2	A study for the improvement of internal processes related to inspection and issuance of various permits	- Objective: To study how to improve the efficiency of the Civil Aviation Authority of Thailand’s internal processes in a bid to accommodate the demands of aviation businesses - Key Tasks: Adopting Lean Manufacturing processes in CAAT’s operations, designing for installation of information technology and data management systems for CAAT in a bid to speed up the permit issuance process for operators, so that operators can easily understand the issuance process, which will maximise the service efficiency. This includes training of the CAAT staff on their organisational role as a facilitator for aviation business operators, improvement of staff’s service-mind, and how to adapt themselves to the Lean Manufacturing process, etc. - Goal: A guideline on improvement of internal processes, information technology and the data management systems	2020 (1 year)	30.0																	• Civil Aviation Authority of Thailand	
Measures																						
1	Improvement of internal processes related to inspection and issuance of various permits	- Objective: To improve the efficiency of the Civil Aviation Authority of Thailand’s internal processes in a bid to accommodate the demands of aviation businesses - Key Tasks: The application of the Lean Manufacturing principle in operations and design, and the establishment of information technology and data management at the Civil Aviation Authority of Thailand in a bid to speed up the permit issuance process for operators in an efficient manner - Goal: Improved internal processes through the utilisation of information technology and data management in operations	2021 - 2022 (2 years)	-																	• Civil Aviation Authority of Thailand	

Table A-2 Planned Projects/Measures under Development Framework 2 - Promoting Airlines and Supporting Businesses (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																	Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033			
Development Framework 2 - Promoting Airlines and Supporting Businesses (continued)																						
Framework Component 2.1 - Promoting and facilitating the airline business and its supporting businesses in Thailand (continued)																						
Strategy 2 - Promoting cooperation amongst tourism/airport/airline/local administrative agencies																						
Projects																						
	-	-	-	-																		-
Measures																						
1	Appointment of joint committees between the public and private sectors to develop air transport in a bid to accommodate tourists	- Objective: To utilise a mechanism to promote and forecast market trends among related agencies in a bid to boost Thailand’s role as a regional destination and transfer hub - Key Tasks: Appointment of joint committees between the public and private sectors, at regional and provincial level, consisting of representatives from the following agencies: • Tourism Authority of Thailand • Airports of Thailand Public Company Limited • Department of Airports • Business Airline Association • local agencies • Office of Transport and Traffic Policy and Planning - The committees will cooperate on determining measures for market development, passenger volume forecasting, infrastructure demand and related air transport services, in a bid to prepare for future market demands - Goal: Integrated development between tourism and air transport	2019 - 2033 (15 years)	-																	• Ministry of Transport (National Transport Policy Committee)	
Strategy 3 - Improving internal administrative mechanisms of all agencies in the airports to standardise departure, arrival, and CIQ times																						
Projects																						
1	Study of measures to improve the efficiency of passenger movements in passenger terminals at Suvarnabhumi Airport and Don Mueang International Airport during departure, arrival and transfer, to improve passenger flow and airport capacity	- Objective: To plan the improvement of airport facilities in accordance with passenger movements - Key Tasks: The study to improve the efficiency of passenger flow in the terminals at Suvarnabhumi Airport and Don Mueang International Airport to reduce delays and increase passenger convenience during departure, arrival and transfer - Goal: To develop efficient passenger flow patterns in the terminals and plan for improvement of the existing situation	2020 (1 year)	30.0																	• Airports of Thailand Public Company Limited	
2	Improvement in efficiency of passenger flows in the terminals at Suvarnabhumi Airport and Don Mueang International Airport	- Objective: To increase passenger terminal capacity and passenger convenience during departure, arrival and transfer - Key Tasks: Construction and improvement in the condition of passenger terminals at Suvarnabhumi Airport and Don Mueang International Airport, according to the study results, to reduce delays and increase passenger convenience during departure, arrival and transfer - Goal: Efficient and comfortable passenger flow patterns at Suvarnabhumi airport and Don Mueang International Airport without any delays	2021 - 2023 (3 years)	500.0																	• Airports of Thailand Public Company Limited	
3	The Study to improve the efficiency of passenger flows in terminals at secondary hub airports (Group 2)	- Objective: To plan the improvement of airport facilities that impact on passenger flows in terminals, during departure, arrival and transfer, to improve the flow and capacity at airports Key Tasks: The study to improve the efficiency of passenger flow in the terminal at Krabi Airport to reduce delays and increase passenger convenience during departure, arrival and transfer - Goal: To develop efficient passenger flow patterns in the terminal and plan for improvement of the existing situation	2024 (1 year)	30.0 (Estimation for AOT and DOA)																	• Department of Airports • Airports of Thailand Public Company Limited	
4	The study to renovate the interior of passenger terminals at secondary hub airports (Group 2) in a bid to increase the efficiency of passenger flow	- Objective: To increase passenger terminal capacity and passenger convenience during departure, arrival and transfer, as well as to accommodate increased traffic in the future - Key Tasks: Construction and improvement in the condition of the passenger terminals at secondary hub airports (Group 2), according to the study results, to reduce delays and increase passenger convenience during departure, arrival and transfer - Goal: Efficient and comfortable passenger flow patterns at secondary hub airports (Group 2) without any delays	2025 - 2026 (2 years)	200.0																	• Department of Airports • Airports of Thailand Public Company Limited	
Measures																						
	-	-	-	-																	-	

Table A-2 Planned Projects/Measures under Development Framework 2 - Promoting Airlines and Supporting Businesses (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																	Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033			
Development Framework 2 - Promoting Airlines and Supporting Businesses (continued)																						
Framework Component 2.1 - Promoting and facilitating the airline business and its supporting businesses in Thailand (continued)																						
Strategy 4 - Promoting general aviation activities, and other related businesses, which includes business aviation that will accommodate premium travellers																						
Projects																						
	-	-	-	-																	-	
Measures																						
1	Granting benefits for private investors for investment in airport development or services that accommodate general aviation	- Objective: To increase activities in general and business aviation in a bid to accommodate increasing demand, as well as serve as an opportunity to develop the skills of pilots and aircraft mechanics in order to support commercial aviation growth in a comprehensive manner - Key Tasks: Granting tax and non-tax benefits to private investors who support the development of general aviation activities, such as renting out aircraft parking space, various types of maintenance and fixed based operator’s (FBO) business aviation - Goal: Growth of the general aviation business with an increasing number of new operators that run their business in a sustainable manner	2019 - 2033 (15 years)	-																	Primary agencies: • Board of Investment (BOI) Supporting agencies: • Office of Transport and Traffic Policy and Planning • Department of Airports • Civil Aviation Authority of Thailand	
2	Determining the direction/measures for promoting and developing General Aviation and related businesses	- Objective: To revise the rules and regulations regarding the administration of general aviation to reduce costs and support the development of businesses related to general and business aviation in Thailand in a sustainable manner - Key Tasks: The revision of rules and regulations concerning permit issuance, registration, inspection, landing permits, etc., through discussion with agencies related to general aviation, in a bid to accommodate market trends and attract more operators in general aviation businesses - Goal: To reduced costs for operators in general aviation businesses and increase the convenience and safety of operations through various regulatory conditions	2020 - 2021 (2 years)	-																	Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Department of Airports • Airports of Thailand Public Company Limited	
Strategy 5 - Encouraging concerned public agencies in aviation to formulate integrative investment and management plans with joint KPIs																						
Projects																						
1	The study of an integrated investment and management plan for concerned public agencies in aviation with Joint KPIs	- Objective: To encourage personnel in concerned public agencies in aviation to have an integrated management plan to achieve common goals - Key Tasks: A study to define KPIs among concerned public agencies in aviation, aiming to promote accountability for each agency and achieve an overall goal of providing a service to the aviation business - Goal: Having a mechanism to evaluate the integrated management plan of concerned public agencies in providing aviation services.	2022 (1 year)	15.0																	• Office of Transport and Traffic Policy and Planning	
Measures																						
1	Appointment of a supervisory board to administer joint KPIs for concerned agencies in aviation	- Objective: To evaluate the performance of concerned agencies in an effective manner - Key Tasks: Appointment of a supervisory board to administer joint KPIs. The board will consist of: • Office of Transport and Traffic Policy and Planning • The Department of Airports • Airports of Thailand Public Company Limited • The Department of U-Tapao International Airport (Royal Thai Navy) • Aeronautical Radio of Thailand Ltd. • The Customs Department • The Immigration Office Their responsibilities will be defining and evaluating joint KPIs for the provision of airport services (such as Departure/Arrival time spent, Minimum Connecting Time, Cargo Transfer Time, etc.), as well as assessing the cause of problems and recommending solutions in an integrative manner . - Goal: Establishing a Supervisory Board to administer joint KPIs to monitor the performance of concerned agencies in an effective manner	2020 - 2033 (14 years)	-																	Primary agencies: • Ministry of Transport (National Transport Policy Committee) Supporting agencies: • Ministry of Finance • Immigration Bureau	

Table A-2 Planned Projects/Measures under Development Framework 2 - Promoting Airlines and Supporting Businesses (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																	Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033			
Development Framework 2 - Promoting Airlines and Supporting Businesses (continued)																						
Framework Component 2.2 - Promoting value-added logistics activities for air cargo																						
Strategy 1 - Developing Airport Logistics Parks on a par with global standards																						
Projects																						
1	To promote private investment in the development and management of an Airport Logistics Park at the Suvarnabhumi Airport	- Objective: To enhance efficiency and capacity to meet the demands of the existing logistics free zone to become the country’s cargo transfer hub - Key Tasks: Implementing a revised study to promote private investment in the development and management of an Airport Logistics Park at Suvarnabhumi Airport, as well as to publicise private investment opportunities in the development of infrastructure, information technology, area management and facilitating operations of current logistics service providers in Suvarnabhumi Airport’s free zone, under long term contracts, with monitoring of Service Level Agreements in accordance with Private Investments in State Undertakings Act B.E. 2556 - Goal: Promoting private investment in the development and management of the existing free zone to become a comprehensive Airport Logistics Park, enabling a rapid increase in the number of goods transfers and incoming value-added logistics activities	2020 - 2022 (3 years)	40.0 (Consultancy expenses to revise the existing study and support Airports of Thailand in inviting and selecting of private sector)																	• Airports of Thailand Public Company Limited	
2	Preparation of an Airport Logistics Park Development Master Plan at Don Mueang International Airport	- Objective: To study and outline private investment patterns in the development and management of existing cargo terminals at Don Mueang International Airport, with the aim to become an Airport Logistics Park and the Cargo Transfer Hub for Low Cost Carriers (LCCs) - Key Tasks: The feasibility study of engineering, economics, environment, finance and joint venture in the development and management of an Airport Logistics Park at Don Mueang International Airport, in order to accommodate cargo businesses and value-added activities for Low Cost Carriers (LCCs), in accordance with Private Investments in State Undertakings Act B.E. 2556 - Goal: Study results that will support the request for Cabinet approval to proceed accordingly	2021 (1 year)	30.0																	• Airports of Thailand Public Company Limited	
3	Feasibility study to develop Airport Logistics Parks at secondary hub airports (Group 2)	- Objective: To study and outline private investment patterns in the development and management of existing cargo terminals at secondary hub airports (Group 2), in order to enable them to become regional Cargo Transfer Hubs - Key Tasks: A study of engineering, financial, economic, investment and environmental feasibility to invest in the development and management of Airport Logistics Parks at secondary hub airports (Group 2), led by the Department of Airports and Airports of Thailand Public Company Limited, in a bid to accommodate cargo businesses and value-added logistics activities, in accordance with Private Investments in State Undertakings Act B.E. 2556 - Goal: Study results that will support a request for Cabinet approval to proceed accordingly	2023 (1 year)	50.0 (Estimation for AOT and DOA)																	• Airports of Thailand Public Company Limited • Department of Airports	
4	Promoting private investment in the development and management of an Airport Logistics Park at Don Mueang International Airport	- Objective: To enhance efficiency and capacity to meet the demands of the existing logistics free zone to become the cargo transfer hub for Low Cost Carriers (LCCs) - Key Tasks: Promoting private investment in the development of infrastructure, information technology and area management, as well as, facilitating operators in the logistics free zone at Don Mueang Airport under long term contracts, with monitoring Service Level Agreements, in accordance with Private Investments in State Undertakings Act B.E. 2556 - Goal: Promoting private investment in the development and management of the existing free zone to become a comprehensive Airport Logistics Park, enabling a rapid increase in the number of goods transfers and incoming value-added logistics activities	2022 - 2024 (3 years)	30.0 (Consultancy expenses to support Airports of Thailand in inviting and selecting of private sector)																	• Airports of Thailand Public Company Limited	

Table A-2 Planned Projects/Measures under Development Framework 2 - Promoting Airlines and Supporting Businesses (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year													Responsible agencies		
					2019	2020	2021	2022	2023	2024	2025	2026	2570	2571	2572	2573	2574		2575	2576
Development Framework 2 - Promoting Airlines and Supporting Businesses (continued)																				
Framework Component 2.2 - Promoting value-added logistics activities for air cargo (continued)																				
Strategy 1 - Developing Airport Logistics Parks on a par with global standards (continued)																				
Projects (continued)																				
5	Promoting private investment in the development and management of Airport Logistics Parks at secondary hub airports (Group 2)	- Objective: To enhance the efficiency and capacity to meet the demands of existing logistics free zones at Secondary Hub Airports (Group 2), which are led by the Department of Airports and Airports of Thailand Public Company Limited, to become regional cargo transfer hubs - Key Tasks: Promoting private investment in the development of infrastructure, information technology and area management, as well as, facilitating operators in the logistics free zones at secondary Hub Airports (Group 2) under long term contracts, with monitoring Service Level Agreements, in accordance with Private Investments in State Undertakings Act B.E. 2556 - Goal: Promoting private investment in the development and management of the existing free zones to become comprehensive Airport Logistics Parks, enabling a rapid increase in the number of goods transfers and incoming value-added logistics activities	2024 - 2026 (3 years)	50.0 (Consultancy expenses to support Airports of Thailand in inviting and selecting of private sector)																• Airports of Thailand Public Company Limited • Department of Airports
Measures																				
	-	-	-	-																-
Strategy 2 - Improving cargo examination and customs processes to better facilitate operators and reduce cost																				
Projects																				
1	The study to establish guidelines and procedures to develop the management of the Airport Logistics Park at Suvarnabhumi Airport	- Objective: To determine an approach to solve the issues of regulations and free zone management at Suvarnabhumi Airport, in a bid to promote value-added activities - Key Tasks: The analysis of regulations and management issues that are hindering the growth of transfer goods and value-added activities in the existing free zone, as well as a proposal for guidelines and procedures in solving the aforementioned issues, to promote the zone to become a comprehensive Airport Logistics Park - Goal: Determining a methodology for improvement of regulations and management in the existing free zone to enable it to become a comprehensive Airport Logistics Park	(Pilot project)	-																• Office of Transport and Traffic Policy and Planning
Measures																				
1	Revising regulations for collecting value-added tax for activities in the Airport Logistics Park	- Objective: To eliminate hindrance regarding the regulations for operating value-added activities in the free zone at Suvarnabhumi Airport, to achieve the establishment of an Airport Logistics Park in the future - Key Tasks: Revision of the laws and regulations for collecting value-added tax for activities in the Airport Logistics Park to be on a par with global standards, to ensure that the Airport Logistics Park at Suvarnabhumi Airport and other airports will attract more value-added activities, which will help increase their capacity to become the country’s transfer hubs - Goal: Operators can operate value-added activities in the Airport Logistics Park at Suvarnabhumi Airport, and other airports in the future, and are able to compete with Airport Logistics Parks in neighboring countries	2019 - 2021 (3 years)	-																Primary agencies: • Ministry of Finance Supporting agencies: • Office of Transport and Traffic Policy and Planning
2	Revision of regulations on cargo examination and customs processes at Airport Logistics Parks	- Objective: To revise regulations that are hindering cargo examination and value-added activities at free zones, which are to be developed into Airport Logistics Parks - Key Tasks: Revision of laws and regulations for cargo examination and value-added activities at Airport Logistics Parks to be on a par with global standards to ensure that the Airport Logistics Park at Suvarnabhumi Airport, and other airports, will attract more value-added activities, which will help to increase their capacity to become the country’s transfer hubs - Goal: Operators can operate value-added activities in the Airport Logistics Park at Suvarnabhumi Airport, and other airports in the future, and are able to compete with Airport Logistics Parks in neighboring countries, as well as accommodating increased volume of cargo as a result of improved efficiency	2019 - 2021 (3 years)	-																Primary agencies: • Customs Department Supporting agencies: • Office of Transport and Traffic Policy and Planning

Table A-2 Planned Projects/Measures under Development Framework 2 - Promoting Airlines and Supporting Businesses (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year														Responsible agencies	
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032		2033
Development Framework 2 - Promoting Airlines and Supporting Businesses (continued)																				
Framework Component 2.3 - Promoting development of MRO businesses and aircraft parts manufacturing																				
Strategy 1 - Facilitating market-driven MRO businesses, as well as other supporting businesses																				
Projects																				
1	Feasibility study to allow private investment in the development of aircraft maintenance, repair & overhaul (MRO) and aircraft parts repair at regional airports	- Objective: To study the feasibility of projects and the investment patterns for the private sector to invest in the development of MRO and aircraft parts repair at regional airports with high potential - Key Tasks: Feasibility study for engineering, environment, economic, finance, and investment patterns for the private sector to invest in the development of MRO and aircraft parts repair, particularly for C-Check and D-Check activities, at regional airports with high potential, such as Chiang Rai Airport, Nakhon Ratchasima Airport, Sakon Nakhon Airport and Trang Airport. The study should cover market analysis of the aircraft maintenance business, both non-aviation activities and General Aviation, to take geographic advantage in supporting the market in the Asia-Pacific region. - Goal: Study results that will support a request for Cabinet approval to proceed accordingly	2020 - 2022 (3 years)	100.0 (Estimation for AOT and DOA)																• Department of Airports • Airports of Thailand Public Company Limited
2	Allowing private investment in the development of aircraft maintenance, repair & overhaul (MRO) and aircraft parts repair at high-potential regional airports	- Objective: To meet the demands for MRO and aircraft parts repair by airlines and General Aviation, which will expand the market for MRO in Thailand, as well as increase utilisation and business opportunities for regional airports with high potential - Key Tasks: Promoting private investment in the development of MRO and aircraft parts repair at high-potential regional airports, including developing information technology, management and facilitating operators of airlines and aircraft owners, under long term contracts with monitoring Service Level Agreements to be in accordance with Private Investments in State Undertakings Act B.E. 2556 - Goal: Having the private sector invest in the development of aircraft maintenance, repair & overhaul (MRO) and aircraft parts repair at regional airports with high potential	2021 - 2025 (5 years)	100.0 (Consultancy expenses to support Airports of Thailand in inviting and selecting of private sector)																• Department of Airports • Airports of Thailand Public Company Limited
3	Establishing the U-Tapao Aircraft Maintenance, Repair & Overhaul (MRO) facility	- Objective: To restructure aviation supporting businesses and create opportunities for the development of an MRO business through co-investment with aircraft/aircraft parts manufacturers, which capitalises on modern technologies and innovation. This is to ensure competitive costs, streamlined and effective management, and the development of the Thai aviation sector. - Key Tasks: To establish an MRO facility (continued implementation from 2016 under the plans/projects of THAI Airways International, Pcl.) that aims to be the world’s no. 1 MRO for “On Time, On Cost, On Quality”. The concept is to join hands with the private sector in establishing the U-Tapao Aircraft Maintenance, Repair & Overhaul (MRO) facility to enhance the country’s MRO capacity for new generation aircraft and an expanding customer base. This will engender the development of the national economy and aviation sector in accordance with the government’s policy - Goal: Establishing a new U-Tapao Aircraft Maintenance, Repair & Overhaul (MRO) facility, east of U-Tapao International Airport	2019 - 2022 (4 years)	4,294.0*																• Thai Airways International Public Company Limited
Measures																				
1	Providing investment privileges to encourage investment in MRO and aircraft parts repair	- Objective: To promote both domestic and international investment in the MRO business for various types of aircraft, including general aviation, as well as MRO and aircraft parts repair - Key Tasks: Granting tax and non-tax benefits to private investors who support MRO and aircraft parts repair businesses at public or private airports, particularly for C-Check and D-Check activities. It also includes tax benefits for foreign investors, who own more than 50% of the shares in newly registered businesses, since the technology used in this business is still being monopolized by the aircraft manufacturers at the OEM and Tier-1 level. It aims to promote the development of MRO, which will increase Thailand’s competitiveness as an MRO hub - Goal: Growing an MRO business centre with increased number of new operators that run their businesses sustainably	2019 - 2033 (15 years)	-																• Board of Investment (BOI)

Table A-2 Planned Projects/Measures under Development Framework 2 - Promoting Airlines and Supporting Business (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year															Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	
Development Framework 2 - Promoting Airlines and Supporting Business (continued)																				
Framework Component 2.3 - Promoting development of MRO businesses and aircraft parts manufacturing (continued)																				
Strategy 2 - Promoting Thailand as aircraft parts manufacturing base in the Asia-Pacific Region																				
Projects																				
1	Establishment of an aircraft parts research and production centre	- Objective: To apply technology in the aircraft parts manufacturing industry - Key Tasks: Establishment of an aircraft parts research and production centre by utilising an initial budget for studying and planning the business model, organisational structure, workforce, etc. The centre can be established with international cooperation in order to acquire knowledge from developed countries and put it into practice locally - Goal: Having an aircraft parts research and production centre for commercial use	2020 - 2021 (2 years)	100.0 (initial budget for establishment of the centre)																Primary agencies: • Ministry of science, Technology and Environment Supporting agencies: • Ministry of Industry • Office of Transport and Traffic Policy and Planning
Measures																				
1	Providing benefits to encourage investment in the aircraft manufacturing industry	- Objective: To promote domestic and international investment in the aircraft parts manufacturing industry - Key Tasks: Granting tax and non-tax benefits to private investors who support the development of the aircraft parts manufacturing industry in the Eastern Economic Corridor (EEC) and nearby airports in the regions, in a bid to expand the production base in Thailand to other regions, which can be developed into aircraft parts manufacturing hubs in the future - Goal: Growing the aircraft parts manufacturing industry with increased number of new operators, especially those at Tier 1 and Tier 2, that can run their businesses sustainably	2019 - 2033 (15 years)	-																• Board of Investment (BOI)

Remark: * Budget under Thai Airways International Public Company Limited’s plan

 ■■■■■■■ indicated on-going operations to achieve long term goal

Source: Analysed by Consultant

Table A-3 Planned Projects/Measures under Development Framework 3 - Development of Air Navigation Services

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																	Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033			
Development Framework 3 - Development of Air Navigation Services																						
Framework Component 3.1 - Strengthening Thailand’s air navigation service capacity to accommodate ASBU and the Asia/Pacific Seamless ATM Plan																						
Strategy 1 - Developing air traffic services																						
Projects																						
1	A study of the capacity of the air traffic management system	- Objective: To identify airports’ capacity levels to accommodate domestic flights, within the Bangkok Flight Information Region, to be utilised as guidelines for planning the system development - Key Tasks: A study to identify airports’ capacity levels to accommodate domestic flights within Bangkok Flight Information Region (continued from AEROTHAI’s project activity in 2016) - Goal: Study results that identify airports’ capacity levels to accommodate domestic flights within Bangkok Flight Information Region	2016 - 2019 (4 years)	372.0*																	• Aeronautical Radio of Thailand Ltd.	
2	Infrastructure for Air Navigation Services (ANS)	- Objective: To enhance the capacity and performance of Air Navigation Services (ANS) - Key Tasks: Utilisation of automated infrastructure and devices for Air Navigation Services (ANS) in a bid to enhance safety and efficiency in Air Traffic Management - Goal: Thailand has an effective Air Navigation Services (ANS) infrastructure system and devices	2019 - 2020 (2 years)	4,461.0*																	• Aeronautical Radio of Thailand Ltd.	
Measures																						
1	Implementation of a new Wake Turbulence Separation system	- Objective: To improve the capacity and efficiency of airport runways - Key Tasks: Developing rules and regulations for implementing the ICAO’s new Wake Turbulence Separation system - Goal: To implement the new Wake Turbulence Separation system that is applicable to each type of aircraft at each operating airport	2021 - 2027 (7 years)	-																	Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Aeronautical Radio of Thailand Ltd.	
2	Encouraging neighboring countries to improve capacity of Air Traffic Flow Management (ATFM)	- Objective: To encourage neighboring countries to improve the capacity of Air Traffic Flow Management (ATFM) in a bid to increase air traffic growth projections in the Asia-Pacific region - Key Tasks: Encouraging neighboring countries to improve the capacity of Air Traffic Flow Management (ATFM) in accordance with the ICAO Asia/Pacific Framework for Collaborative ATFM - Goal: Neighboring countries will have improved the capacity of Air Traffic Flow Management (ATFM) in a bid to increase air traffic flow in the Asia-Pacific region	2019 - 2026 (7 years)	-																	Primary agencies: • Aeronautical Radio of Thailand Ltd. Supporting agencies: • Civil Aviation Authority of Thailand • Airports of Thailand Public Company Limited • Department of Airports • U-Tapao International Airport (Royal Thai Navy)	
3	Fatigue Management	- Objective: To implement a fatigue management system for air traffic control officers - Key Tasks: Rules and regulations on fatigue management of air traffic control officers - Goal: Implementing rules and regulations on fatigue management of air traffic control officers	2019 - 2021 (3 years)	-																	Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Aeronautical Radio of Thailand Ltd.	
4	Civil-Military Cooperation	- Objective: To improve the use of airspace in accordance with the Flexible Use of Airspace concept - Key Tasks: Civil-Military cooperation, particularly on the following topics: 1) Promoting cooperation and the implementation of the Flexible Use of Airspace concept 2) Promoting the procurement and utilisation of an air traffic control management system between civilian agencies and the military - Goal: Having a clear and concrete civil-military cooperation policy to promote the implementation of the Flexible Use of Airspace concept	2020 - 2025 (6 years)	-																	Primary agencies: • Ministry of Transport (National Transport Policy Committee) • Ministry of Defense Supporting agencies: • Royal Air Force • Civil Aviation Authority of Thailand • Aeronautical Radio of Thailand Ltd.	
5	Review of Special Use Airspace	- Objective: Review of Special Use Airspace to accommodate and boost the implementation of the Flexible Use of Airspace concept - Key Tasks: Review of Special Use Airspace - Goal: Having maximum efficiency in Special Use Airspace management for both air traffic and security purposes	2020 -2021 (2 years)	-																	Primary agencies: • Civil Aviation Authority of Thailand • Royal Air Force Supporting agencies: • Aeronautical Radio of Thailand Ltd.	

Table A-3 Planned Projects/Measures under Development Framework 3 - Development of Air Navigation Services (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																		Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033				
Development Framework 3 - Development of Air Navigation Services (continued)																							
Framework Component 3.1 - Strengthening Thailand’s air navigation service capacity to accommodate ASBU and the Asia/Pacific Seamless ATM Plan (continued)																							
Strategy 1 - Developing air traffic services (continued)																							
Measures (continued)																							
6	Implementation of Airport Collaborative Decision Making (A-CDM)	- Objective: To enhance the efficiency of internal operations - Key Tasks: Implementation of Airport Collaborative Decision Making (A-CDM) in accordance with the Asia/Pacific Seamless ATM Plan - Goal: Concerned stakeholders cooperate in implementing A-CDM to ensure maximum efficiency of internal operations	2020 - 2021 (2 years)	-																		Primary agencies: • Airports of Thailand Public Company Limited • Department of Airports • U-Tapao International Airport (Royal Thai Navy) Supporting agencies: • Civil Aviation Authority of Thailand • Aeronautical Radio of Thailand Ltd.	
7	Implementation of Apron Management	- Objective: To improve the capacity and efficiency of the airport system - Key Tasks: Developing rules, regulations and operational guidelines for airport personnel in Apron Management - Goal: Efficient and safe Apron Management	2019 - 2020 (2 years)	-																		Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Airports of Thailand Public Company Limited • Department of Airports • U-Tapao International Airport (Royal Thai Navy)	
Strategy 2 - Developing Aeronautical Information Management (AIM)																							
Projects																							
1	Developing air traffic management systems	- Objective: To develop operational Aeronautical Information Management (AIM) in accordance with the ICAO’s Global Air Traffic Management Operational Concept - Key Tasks: Guidelines for developing operational Aeronautical Information Management (AIM) in accordance with the ICAO’s Global Air Traffic Management Operational Concept, including: 1) Aeronautical Information Management 2) System Wide Information Management (SWIM) - Goals: Explicit and tangible implementation of the ICAO’s Global Air Traffic Management Operational Concept	2020 - 2022 (3 years)	120.0																		• Civil Aviation Authority of Thailand • Aeronautical Radio of Thailand Ltd.	
Measures																							
	-	-	-	-																		-	
Strategy 3 - Developing Communications, Navigation and Surveillance (CNS)																							
Projects																							
1	Study for the development of navigation systems	- Objective: To improve the efficiency of navigation systems - Key Tasks: Strategic direction for developing navigation systems based on the Global Navigation Satellite System (GNSS), as well as to promote the use of Performance-Based Navigation - Goal: Development plan for the navigation system and operations within Bangkok Flight Information Region	2020 - 2022 (3 years)	30.0																		Primary agencies: • Civil Aviation Authority of Thailand • Aeronautical Radio of Thailand Ltd.	

Table A-3 Planned Projects/Measures under Development Framework 3 - Development of Air Navigation Services (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																		Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033				
Development Framework 3 - Development of Air Navigation Services (continued)																							
Framework Component 3.1 - Strengthening Thailand’s air navigation service capacity to accommodate ASBU and the Asia/Pacific Seamless ATM Plan (continued)																							
Strategy 3 - Developing Communications, Navigation and Surveillance (CNS) (continued)																							
Projects (continued)																							
2	Study for development of surveillance systems	- Objective: To improve the efficiency of aircraft surveillance systems - Key Tasks: Strategic direction on developing surveillance systems, particularly on Automatic Dependent Surveillance Broadcast (ADS-B) - Goal: Development plan for surveillance systems and operations within Bangkok Flight Information Region	2020 - 2021 (2 years)	30.0																		• Aeronautical Radio of Thailand Ltd.	
Measures																							
1	Development of aircraft navigation systems	- Objective: To develop aircraft navigation systems to increase the capacity and efficiency of aviation operations throughout the flight - Key Tasks: Implementing study results from project (1) into practice - Goal: Having an effective aircraft navigation system	2022 - 2033 (12 years)	-																		• Civil Aviation Authority of Thailand • Aeronautical Radio of Thailand Ltd.	
2	Development of aircraft surveillance systems	- Objective: To develop aircraft surveillance systems in a bid to increase safety, capacity and performance in operations throughout the flight - Key Tasks: Implementing study results from project (2) into practice - Goal: Having an effective aircraft surveillance system	2022 - 2033 (12 years)	-																		Primary agencies: • Aeronautical Radio of Thailand Ltd. Supporting agencies: • Civil Aviation Authority of Thailand	
3	Feasibility study of surveillance information exchange with neighboring countries	- Objective: To improve air traffic management through the development of an aircraft surveillance system - Key Tasks: Feasibility study of surveillance information exchange with countries that share land borders and/or without an existing aircraft surveillance system - Goal: Having a development framework for requesting permission to exchange and utilise surveillance information with neighboring countries for air traffic control	2020 - 2021 (2 years)	-																		• Civil Aviation Authority of Thailand • Aeronautical Radio of Thailand Ltd.	
Strategy 4 - Developing Aviation Meteorological Services																							
Projects																							
1	Study for developing Aviation Meteorology	- Objective: To study and determine a development framework for improving capacity and performance of Aviation Meteorology services - Key Tasks: Strategic direction for the development of Aviation Meteorological Services, including: 1) Strategic direction for the development of an Aviation Meteorological Service within Bangkok Flight Information Region 2) Connectivity of digital aviation meteorological information among relevant ground and air agencies - Goal: Integration between Meteorology/Air Traffic Management (MET/ATM) to support decision-making processes	2020 - 2021 (2 years)	30.0																		Primary agencies: • Meteorology Department • Royal Thai Navy Supporting agencies: • Civil Aviation Authority of Thailand • Aeronautical Radio of Thailand Ltd.	
Measures																							
1	Development of aviation meteorological services	- Objective: To improve the capacity and efficiency of aviation meteorological services - Key Tasks: Implementing study results from project (1) into practice - Goal: Providing aviation meteorological services to stakeholders on a par with the ICAO’s standards and customers’ needs	2021 - 2033 (13 years)	-																		Primary agencies: • Meteorology Department • Royal Thai Navy Supporting agencies: • Civil Aviation Authority of Thailand • Aeronautical Radio of Thailand Ltd.	

Remark: * Budget under Aeronautical Radio of Thailand Ltd.’s plan
■■■■■■■■ indicated on-going operations to achieve long term goal
Source: Analysed by Consultant

Table A-4 Planned Projects/Measures under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year															Responsible agencies	
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033		
Development Framework 4 - Development of the Regulatory Mechanism and related Regulations																					
Framework Component 4.1 - Defining a clear and practical regulatory policy																					
Strategy 1 - Setting regulatory policy for economic regulation to ensure free and fair competition																					
Projects																					
1	Study of a development framework and mechanism for administrating economic aspects	- Objective: To conduct a comparative study on the benefits, impacts, advantages and disadvantages between existing economic policies and free and fair competition policies, for the administration of airlines and other supporting aviation businesses, as well as airport operators, to be utilised for policy-making in the future - Key Tasks: To revise air transport policies in a bid to support the changing world and Thailand’s economy towards a free trade era - Goal: Policy makers can utilise the study results for developing air transport policies at the related economic level, which will impact the overall economic laws, rules and regulations	2019 (1 year)	10.0																	Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Office of Transport and Traffic Policy and Planning
2	Development of the knowledge base of government and private agencies on the regulatory policy for economic air transport under a free and fair competition policy	- Objective: Developing the knowledge base of government and private agencies on the regulatory policy for economic air transport under a free and fair competition policy - Key Tasks: Regularly organising seminars or training, provided by senior lecturers from the public and private sectors and other stakeholders, which are tailor-made for government, the private sector and operators, focusing on the background of the existing economic air transport policy, advantages and disadvantages of an economic air transport policy under a free and fair competition policy - Goal: To build the knowledge base of government, the private sector and operators on the principles and rationale of a free and fair competition policy, as well as related laws and regulations	2019 - 2028 (10 years)	5.0 per year. A total of 50.0																	• Civil Aviation Authority of Thailand
3	Developing a knowledge base and understanding of regulatory policy for economic air transport under various policies	- Objective: To develop a knowledge base in government and the private sector on various economic regulatory systems for air transport under a free and fair competition policy - Key Tasks: To research the benefits, impacts, advantages and disadvantages of various regulatory policies for economic air transport, under a free and fair competition policy, for use as a development framework for revising and creating a Thai specific policy, including the governance of airline businesses, supporting business, airport management and other aviation activities. It is also aimed at developing the knowledge base of personnel on a free and fair competition policy, as well as the aforementioned regulatory policy for economic air transport. Goal: To enhance the potential of regulatory agencies, as well as to build understanding and increase the knowledge of government and the private sector of the regulatory policy for economic air transport under a free and fair competition policy	2020 - 2033 (14 years)	2.5 per year. A total of 35.0																	Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Office of Transport and Traffic Policy and Planning
Measures																					
	-	-	-	-																-	
Strategy 2 - Setting a regulatory policy for technical regulation that stands above the minimum standard of the International Civil Aviation Organisation (ICAO)																					
Projects																					
1	Development of regulatory policy for technical regulations	- Objective: To develop a regulatory policy framework for technical regulations to be on a par with the standards of the EASA and the FAA, or to adopt a system from developed countries, revised to meet the needs and context of Thailand - Key Tasks: Developing the knowledge and skills of concerned personnel to ensure the understanding of the principles and guidelines of the regulatory policy for technical regulations that are on a par with the standards of the EASA and the FAA, or by adopting a system from developed countries revised to meet the needs and context of Thailand, through training and hiring foreign experts - Goal: Regulatory agencies understand the policies, concepts and principles of international regulatory policies for technical regulations of the EASA and the FAA, and are able to adopt a system from developed countries and revise them to meet the needs and context of Thailand	2019 - 2023 (5 years)	50 per year. A total of 25.0																	• Civil Aviation Authority of Thailand
Measures																					
	-	-	-	-																-	

Table A-4 Planned Projects/Measures under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																		Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033				
Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)																							
Framework Component 4.1 - Defining a clear and practical regulatory policy (continued)																							
Strategy 3 - Setting safety management policy																							
Projects																							
1	Preparation of a State Safety Program (SSP)	- Objective: To Implement a State Safety Program (SSP) in accordance with the ICAO’s regulations - Key Tasks: According to the Annex 19 of the Convention, a State Safety Program (SSP), under Safety Risk Management (SRM) and Safety Assurance (SA) processes, should be implemented to improve safety in accordance with the required Acceptable Level of Safety Performance (ALOSP) - Goal: Country’s State Safety Program (SSP)	2019 - 2020 (2 years)	18.0																		• Civil Aviation Authority of Thailand	
Measures																							
1	Review of the safety policy based on the ICAO’s guidelines and the current aviation situation	- Objective: To study, analyse and review the existing safety policy to provide clear safety management guidelines - Key Tasks: Review of the safety management system, in accordance with Annex 19 of the Convention, by promoting the development of a safety report and an efficient safety operational process and database - Goal: Having safety policies, regulations and a safety database that is continuously updated	2019 - 2033 (15 years)	-																		• Civil Aviation Authority of Thailand	
Strategy 4 - Setting policy that supports and engenders the growth of other aviation activities																							
Projects																							
1	Study of the benefits, impacts, advantages and disadvantages of support and development of other aviation activities in Thailand	- Objective: To acquire knowledge of the benefits, impacts, advantages and disadvantages of support and development of other aviation activities in Thailand, including the improvement of other aviation and related businesses - Key Tasks: Study of the benefits for Thailand in the case that the government supports other aviation activities - Objective: Policy makers are aware of the benefits, impacts, advantages and disadvantages of support and development of other aviation activities in Thailand, including the improvement of other aviation and related businesses, such as General Aviation, Sport Aviation, Ramp Service, Refueling, Aircraft Repair and Maintenance, Catering, etc.	2022 - 2023 (2 years)	20.0																		• Office of Transport and Traffic Policy and Planning	
2	Promotion of other aviation activities in Thailand	- Objective: To share knowledge, as well as brainstorming the benefits, impacts, advantages and disadvantages of support and development of other aviation activities in Thailand, including the improvement of other aviation and related businesses, such as General Aviation, Sport Aviation, Ramp Service, Refueling, Aircraft Repair and Maintenance, Catering, etc. - Key Tasks: Establishment of a platform to share and spread knowledge on aviation activities and hindrance to the growth of aviation activities in Thailand - Goal: To create awareness of the importance of promoting other aviation activities among the public and private sector	2023 - 2024 (2 years)	5.0																		Primary agencies: • Office of Transport and Traffic Policy and Planning Supporting agencies: • Civil Aviation Authority of Thailand	
Measures																							
1	Creating awareness among concerned agencies on the importance of developing other aviation activities in Thailand	- Objective: Concerned agencies are aware of the importance of developing other aviation activities in Thailand - Key Tasks: 1) Emphasizing the promotion of other aviation activities, other than airline businesses 2) Having a complete overview of the benefits, impacts, advantages and disadvantages of support and development of other aviation activities in Thailand for reference by policy makers 3) Fostering knowledge of other aviation activities among operational personnel and the private sector - Goal: The public and private sector are aware of the importance of supporting other aviation activities, which can promote the overall development of aviation	2019 - 2028 (10 years)	-																		• Office of Transport and Traffic Policy and Planning	

Table A-4 Planned Projects/Measures under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																		Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033				
Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)																							
Framework Component 4.1 - Defining a clear and practical regulatory policy (continued)																							
Strategy 5 - Developing a regulatory mechanism for free and fair competition in airport management																							
Projects																							
1	Developing a regulatory mechanism for free and fair competition in airport management	- Objective: To develop a regulatory mechanism for airport management - Key Tasks: Analysis study for developing a regulatory mechanism for airport management in Thailand, including identifying a responsible agency to collect, evaluate and suggest guidelines for the establishment of free and fair competition in airport management, among airport operators, and for consumers under Consumer Protection. The aim is to develop long-term airport management related regulations, as well as a pricing mechanism in order to promote a more streamlined and relevant business model for providing airport services - Goal: The Civil Aviation Authority of Thailand, as the responsible agency, is equipped with academic knowledge for analyzing and increasing efficiency of the regulatory agency on various topics, such as consumer protection, passenger service charges, as well as airport competitiveness within the region and ASEAN, etc.	2020 (1 year)	40.0																	• Civil Aviation Authority of Thailand		
Measures																							
1	Adopting a competition mechanism for airport management in accordance with the study results	- Objective: To adopt a regulatory mechanism for monitoring the service efficiency of airports - Key Tasks: Adopt a regulatory mechanism for monitoring service efficiency of airports, in accordance with the study results, to ensure free and fair competition, efficiency enhancement of long-term airport management, and development of related regulatory regimes. A pricing mechanism will also be adopted to streamline airport management in line with the airport operation model. - Goal: The CAAT is able to monitor airport operators to ensure service efficiency and benefits to airport users (passengers, cargo and airline operators).	2021 - 2033 (13 years)	-																	• Civil Aviation Authority of Thailand		
Strategy 6 - Developing a mechanism to ensure efficiency and independence of aircraft accident investigation																							
Projects																							
1	Study to develop a mechanism for aircraft accident investigation to be on a par with international standards	- Objective: To increase the efficiency of aircraft accident investigation to be on a par with international standards - Key Tasks: Aircraft accident investigation is an important mission for the civil aviation safety system. To ensure independence of aircraft accident investigation and avoid any conflict of interest among regulatory, administrative agencies and aviation services providers, a mechanism must be established - Goal: Development plan for aircraft accident investigation system, including proper status and structure	2020 (1 year)	8.0																	• Office of the Permanent Secretary Ministry of Transport		
2	Study to establish a data connection system for safety information and investigating aircraft accidents	- Objective: To enhance efficiency of the safety information system - Key Tasks: Safety information from the aircraft accident investigation agency is vital for the aviation safety system; therefore, the system linkage between the aircraft accident investigation agency and regulatory agencies should be established with various level of permissions and conditions - Goal: Development plan for the data connection system for safety information and aircraft accident investigation	2021 (1 year)	6.0																	• Office of the Permanent Secretary Ministry of Transport		
3	Training on guidelines for investigation responsibilities and processes	- Objective: To increase the efficiency of aircraft accident investigation to be on a par with international standards - Key Tasks: Organising training for aircraft accident investigators to ensure their understanding of the investigation standards specified in annex 13 of the Convention, as well as international operational guidelines - Goal: Organising training for aircraft accident investigators to ensure their understanding of aircraft accident investigation is on a par with international standards	2019 - 2028 (10 years)	6.0 per year. A total of 60.0																	• Office of the Permanent Secretary Ministry of Transport		
Measures																							
	-	-	-	-																	-		

Table A-4 Planned Projects/Measures under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																		Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033				
Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)																							
Framework Component 4.1 - Defining a clear and practical regulatory policy (continued)																							
Strategy 7 - Developing a mechanism for aircraft search and rescue on a par with international standards																							
Projects																							
1	Study of the system and organisational structure for aircraft Search and Rescue (SAR) that is on a par with international standards	- Objective: To increase the efficiency of aircraft search and rescue to be on a par with international standards - Key Tasks: Aircraft search and rescue requires collaboration with various agencies; therefore, a system and organisational structure should be established in a bid to have clear guidelines for collaboration and responsibilities, as well as to establish a necessary regulatory board or working group to determine standards, operations and any other agreements, in an efficient manner - Goal: Development plan for the aircraft search and rescue system including proper status and structure	2020 (1 year)	6.0																	• Office of the Permanent Secretary Ministry of Transport		
2	Study for developing a mechanism for aircraft search and rescue	- Objective: To increase the efficiency of aircraft search and rescue to be on a par with international standards - Key Tasks: To ensure alignment among concerned agencies based on standardized aircraft search and rescue operations. Each agency must develop its own National SAR plan and specify their operations and processes in detail - Goal: Having a National SAR Plan	2021 (1 year)	8.0																	• Office of the Permanent Secretary Ministry of Transport		
3	Training on aircraft search and rescue	- Objective: To increase the efficiency of aircraft search and rescue to be on a par with international standards - Key Tasks: Organising training for aircraft search and rescue crews to ensure their understanding of the search and rescue standard specified in annex 12 of the Convention, as well as international operational guidelines - Goal: Organising training for aircraft search and rescue crews to ensure their understanding of the aircraft search and rescue standard, and to be on a par with international standards	2021 - 2025 (5 years)	10.0																	• Office of the Permanent Secretary Ministry of Transport		
Measures																							
	-	-	-	-																	-		
Framework Component 4.2 - Capacity building of the regulatory body																							
Strategy 1 - Capacity building of the regulatory agency (economic affairs) in line with the policy on free and fair competition in the aviation business																							
Projects																							
1	Development of the Civil Aviation Authority of Thailand’s personnel on the long-term administration and policy-making of economic air transport under other regulatory policies and the free and fair competition policy	- Objective: 1) To develop the knowledge base of the Civil Aviation Authority of Thailand’s personnel on economic air transport under other regulatory policies and the free and fair competition policy, 2) To dynamically develop the agency and their knowledge base on economic air transport in line with changing business environment in air transport - Key Tasks: 1) Organising training for personnel of the Ministry of Transport, the Office of Transport and Traffic Policy and Planning and the Civil Aviation Authority of Thailand, on the long-term administration and policy-making of economic air transport under other regulatory policies and the free and fair competition policy 2) Developing curricula covering basic knowledge in various areas related to air transport, aiming to develop a clear understanding among personnel of the Ministry of Transport, the Office of Transport and Traffic Policy and Planning and the Civil Aviation Authority of Thailand - Goal: 1) Regulatory agencies are aware of the principles and logic of the free and fair competition policy, which can be utilised as the basis of enforcing rules and regulations and developing relevant policies accordingly 2) Regulatory personnel will have the authority and responsibility for administrating the Civil Aviation Authority of Thailand, including policy makers, and for administrating economic air transport	2019 - 2028 (10 years)	10.0																	• Civil Aviation Authority of Thailand		

Table A-4 Planned Projects/Measures under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																	Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033			
Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)																						
Framework Component 4.2 - Capacity building of the regulatory body (continued)																						
Strategy 1 - Capacity building of the regulatory agency (economic affairs) in line with the policy on free and fair competition in the aviation business (continued)																						
Projects (continued)																						
2	Research and development of the existing mechanism when compared with the governance mechanism under the free and fair competition policy	- Objective: To improve the existing mechanism to be on a par with the free and fair competition policy - Key Tasks: Study of the viability of the existing mechanism under the free and fair competition policy, in regard to airport management, airline operating businesses, aviation activities, and other activities related to air transport, including the mechanism for monitoring operators’ qualifications and businesses - Goal: The regulatory and policy-making agency will utilise the knowledge to improve the existing mechanism	2020 (1 year)	10.0																	Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Office of Trade Competition Commission	
Measures																						
1	Developing the regulatory agency in line with the free and fair competition policy	- Objective: Developing the operating structure and responsibilities of the regulatory agency to be in line with the free and fair competition policy - Key Tasks: Developing the regulatory agency (economic affairs) to be in line with the free and fair competition policy, such as identifying the regulatory authority for administrating business behavior of the airline business and other supporting businesses - Goal: The Civil Aviation Authority of Thailand, as the regulatory agency (economic affairs), has the required authority to foster competition in all sectors of the aviation business	2019 - 2023 (5 years)	-																	• Civil Aviation Authority of Thailand	
2	Revision of laws related to the structure of the Ministry of Transport’s internal agency to be in line with the free and fair competition policy	- Objective: To revise related laws that promote the application of the free and fair competition policy through establishment of a regulatory agency responsible for policy-making and implementation under the long-term economic air transport policy - Key Tasks: Revision of laws related to the structure of the Ministry of Transport’s internal agency, to ensure that policy-making on air transport is independent from the existing regulatory mechanisms. The aim is to establish a responsible agency, which maybe be an existing one under the Ministry of Transport with additional authority for policy-making and monitoring long-term air transport policies, to establish accountability - Goal: A policy is developed properly and clearly, and monitored in a robust and efficient manner	2019 - 2023 (5 years)	-																	Primary agencies: • Ministry of Transport (National Transport Policy Committee) Supporting agencies: • Civil Aviation Authority of Thailand	
3	Identifying a clear goal and scope for the administration of economic air transport	- Objective: To ensure that operations are on a par with the free and fair competition policy - Key Tasks: The Civil Aviation Authority of Thailand develops clear long-term goals and scope for the administration of economic air transport, to be on a par with the free and fair competition policy through setting clear roles and responsibilities, such as airport economic regulation, price control and airline operators’ behavior in competing in a fair manner, as well as the administration of air traffic related operators - Goal: The Civil Aviation Authority of Thailand’s personnel have goals and scope to administer economic air transport to be on a par with the free and fair competition policy	2019 - 2021 (3 years)	-																	• Civil Aviation Authority of Thailand	
Strategy 2 - Improving roles and authorities for technical regulatory affairs																						
Projects																						
1	Study on improving the organisational structure for technical regulation	- Objective: To improve the effectiveness of technical regulation - Key Tasks: To implement a development plan for improving the organisational structure for technical regulation, as follows: 1) comprehensive regulation, including safety and security affairs, 2) selection and development of technical personnel, 3) evaluation of qualifications, reasonable workloads and compensation in line with technical knowledge and experience - Goal: Development framework for improving the organisational structure of technical regulation	2020 - 2024 (5 years)	15.0																	• Civil Aviation Authority of Thailand	

Table A-4 Planned Projects/Measures under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year																		Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033				
Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)																							
Framework Component 4.2 - Capacity building of the regulatory body (continued)																							
Strategy 2 - Improving roles and authorities for technical regulatory affairs (continued)																							
Projects (continued)																							
2	Development of safety inspection, monitoring, review and audit	- Objective: To improve the effectiveness of technical regulation - Key Tasks: Developing technical regulation on the following: 1) Preparing clear and comprehensive guidelines and an approach to reduce ad-hoc decision-making by officials 2) Allocating sufficient equipment with advanced technology, for organising operational steps, in accordance with the manuals and regulations, to enable data collection and transfer to an online database for easy access to monitor progress and improvement, as well as organising necessary training and operational guidelines on ethics, technical auditing, documentation, reporting and improvement planning for aviation operators 3) Organising training for inspectors on essential knowledge, i.e. inspection operational methods, ethics, techniques, recording, reporting, and how to assess operator’s remediation plans. - Goal: The Civil Aviation Authority of Thailand is equipped with sufficient operational systems, tools and personnel	2020 - 2023 (4 years)	30.0																	• Civil Aviation Authority of Thailand		
Measures																							
	-	-	-	-																	-		
Strategy 3 - Developing data collection systems for the planning and management of technical and economic affairs																							
Projects																							
1	Establishment of a data collection and research centre for air transport development	- Objective: To establish an organisation that is responsible for data collection, monitoring and evaluation, in accordance with Thailand’s air transport policy - Key Tasks: Study for establishing an organisation that is responsible for data collection, monitoring and evaluation, in accordance with Thailand’s air transport policy, as well as setting roles, responsibilities, authority and budget for collecting data and other statistics that is on a par with, or above, the minimum standards of other countries - Goal: An organisation that is responsible for monitoring and evaluation of performance in various areas, including aviation and aviation personnel, to provide information for the public and private sectors for future planning	2020 - 2022 (3 years)	100.0																	Primary agencies: • Ministry of Transport (National Transport Policy Committee) Supporting agencies: • Civil Aviation Authority of Thailand		
2	Establishment and improvement of a safety data information system	- Objective: To establish a safety data information system - Key Tasks: Safety data and information must be established in a thorough manner, particularly when acquiring sensitive information on accidents, incidents and hazards through mandatory and voluntary reporting, as well as setting up a Safety Data Collection and Processing System (SDCPS) - Goal: Development framework for a safety data information system	2021 - 2022 (2 years)	50.0																	• Civil Aviation Authority of Thailand		
3	Establishment of an economic database system	- Objective: To establish an accurate and flawless database on air transport to be utilised in the negotiation of Air Traffic Rights and operators who abuse the competition mechanism - Key Tasks: Establishment and improvement of a database system regarding the number of flights, passengers and air cargo at every airport, including domestic and international routes, in an effective and accurate manner - Goal: The Civil Aviation Authority of Thailand is the central agency equipped with, and is responsible for organising, the economic air transport database system	2020 - 2022 (3 years)	60.0																	• Civil Aviation Authority of Thailand		
Measures																							
1	Creating an understanding and collaboration between relevant agencies related to data collection	- Objective: To obtain data from relevant agencies at the highest accuracy - Key Tasks: To create an understanding and set-up the process of collecting and transferring data between the Civil Aviation Authority of Thailand and both regular and non-regular aviation operators (airlines), airport operators, state enterprises (Airports of Thailand Public Company Limited), government agencies (Department of Airports and Royal Air Force), and the private sector (Bangkok Airways Public Company Limited) - Goal: The Civil Aviation Authority of Thailand understands and receives support from agencies related to the collection and transfer of data	2019 - 2033 (15 years)	-																	• Civil Aviation Authority of Thailand		

Table A-4 Planned Projects/Measures under Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year															Responsible agencies		
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033			
Development Framework 4 - Development of the Regulatory Mechanism and related Regulations (continued)																						
Framework Component 4.3 - Improvement of the legal framework in the aviation sector																						
Strategy 1 - Developing economic-related laws and regulations in line with the policy on free and fair competition in the aviation business																						
Projects																						
1	Study on developing laws and regulations	- Objective: To set a development framework on economic-related laws and regulations in line with the free and fair competition policy - Key Tasks: Study of existing domestic laws and regulations to develop, revise and legislate in line with the free and fair competition policy, covering regulations for airlines, supporting businesses, other aviation activities, and airport operations. The regulations also cover the monitoring of activities and qualifications of operators and the improvement of consumer protection laws for passengers traveling on domestic and international routes - Goal: The Civil Aviation Authority of Thailand will apply the development framework to the development of economic-related laws and regulations in line with the free and fair competition policy	2020 (1 year)	20.0																	• Civil Aviation Authority of Thailand	
Measures																						
1	Development of laws and regulations	- Objective: To create, improve and revise laws and regulations to be on a par with the free and fair competition policy - Key Tasks: 1) Improvement of domestic laws and regulations in accordance with the Free and Fair Competition Policy, covering the governance of the airline business, supporting and other aviation-related businesses, and airport operators 2) Improving Air Services Agreements at bilateral and multilateral level in accordance with the Free and Fair Competition Policy 3) Developing rules and regulations for monitoring operations and qualifications of operators 4) Improving laws on consumer protection of passengers traveling on domestic and international routes - Goal: Thailand has laws and regulations on the governance of economic air transport in accordance with the Free and Fair Competition Policy for public and private sectors to utilise under an Open Sky Policy	2021 -2025 (5 years)	-																		• Civil Aviation Authority of Thailand
Strategy 2 - Efficiency enhancement of technical-related laws and regulations																						
Projects																						
1	Revising aviation laws according to the ICAO or higher standards, such as the EASA and the FAA, or adopting related laws of developed countries and adapting them to the context in Thailand.	- Objective: To enhance the capacity of technical-related laws and regulations - Key Tasks: Developing clear technical-related laws and regulations, including setting authority for regulatory agencies to issue and enforce technical-related laws and regulations, in a bid to reduce complexity - Goal: A Development Framework for technical-related laws and regulations that are on a par with international standards	2021 - 2022 (2 years)	20.0																	• Civil Aviation Authority of Thailand	
Measures																						
	-	-	-	-																	-	

Remark: ■■■■■■ indicated on-going operations to achieve long term goal

Source: Analysed by Consultant

Table A-5 Planned Projects/Measures under Development Framework 5 - Aviation Human Resource Development

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year														Responsible agencies	
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032		2033
Development Framework 5 - Aviation Human Resource Development																				
Framework Component 5.1 - Upgrading aviation human resource development standards in order to be responsive to business needs																				
Strategy 1 - Promoting collaboration among academic institutes and training centres, in both the public and private sectors, to develop curricula that are on a par with, or above, the ICAO standards (e.g. EASA or FAA)																				
Projects																				
1	Study of the development and integration of curricula on a par with, or above, the ICAO standard, e.g., EASA, or FAA	- Objective: To develop and integrate curricula on a par with, or above the ICAO standard, e.g., EASA, or FAA, especially for licensing personnel, including implementing a higher ICAO standard to ensure personnel have a diverse skill set - Key Tasks: Production and development of aviation personnel, focusing on quality, especially for licensed personnel. In this regard, it should focus on maintaining curricula quality standards and implementing a stricter control mechanism on a par with the ICAO standard - Goal: Production and training centres, certified by the ICAO and applying higher than ICAO standards in setting curricula in the future	Short-term (ICAO) 2020-2021 (2 years) Long-term (Integration EASA/FAA) 2022-2028 (7 years)	50.0																• Civil Aviation Authority of Thailand • Ministry of education
2	Study of demand in the aviation market for development of aviation personnel	- Objective: Study of demand in the aviation industry for developing curricula - Key Tasks: Study of demand in the aviation industry, to be utilised as guidelines in the development of curricula, through conducting a survey of airline operators in regard to aviation personnel, including attitudes, expectations and other unknown requirements - Goal: Study results of the demand in the aviation industry that can be utilised as guidelines in the development of curricula by production institutes and aviation personnel training centres	2020 - 2021 (2 years)	20.0																• Civil Aviation Authority of Thailand
3	Upgrading the Civil Aviation Training Centre from a full member of the ICAO’s TRAINAIR PLUS to an ICAO Regional Training Centre of Excellence (RTCEs)	- Objective: To upgrade the training standards of the Civil Aviation Training Centre - Key Tasks: Upgrading the Civil Aviation Training Centre from a full member of the ICAO’s TRAINAIR PLUS to an ICAO Regional Training Centre of Excellence (RTCEs), consisting of 2 subordinate plans, such as “improvement plan” and “development plan”, in a bid to strengthen the centre’s expertise in the region (in accordance with the Civil Aviation Training Centre’s plan from 2017) - Goal: To upgrade the Civil Aviation Training Centre to an ICAO Regional Training Centre of Excellence (RTCEs)	2019 - 2021 (3 years)	(Under Consideration)*																• Civil Aviation Training Centre
Measures																				
1	Setting all curricula in the English language	- Objective: To implement measures to prepare all curricula at production and training centres in the English language - Key Tasks: Setting aviation curricula in the English language, both for lectures and labs, in a bid to equip aviation personnel with sufficient English proficiency to support the future growth in the aviation business - Goal: All curricula at production and training centres are taught in the English language	2019 - 2033 (15 years)	-																Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Ministry of education
Strategy 2 - Developing and setting a mechanism for curricula standard control																				
Projects																				
	-	-	-	-																-
Measures																				
1	Setting guidelines and mechanisms for managing aviation curricula standards for production and training centres	- Objective: To set guidelines and mechanisms for managing aviation curricula standards for production and training centres - Key Tasks: Setting strict mechanisms for institutes/universities to provide curricula accredited by the international institute in order to manage personnel development standards that meet market needs - Goal: Production institutes and aviation personnel training centres operate on a par with the standards	2019 - 2033 (15 years)	-																• Civil Aviation Authority of Thailand
Strategy 3 - Developing and providing support for academic institutes and training centres to be equipped with sufficient and proper facilities																				
Projects																				
1	Standardizing facilities at production institutes and aviation personnel training centres	- Objective: To study the standardizing of facilities of production institutes and aviation personnel training centres, including the establishment of a Standard Control and Verification Board - Key Tasks: Standardization of facilities at concerned institutes and establishment of a Standard Control and Verification Board to ensure standards in training (in classroom, laboratory and the field) and facilities - Goal: Production institutes and aviation personnel training centres are equipped with sufficient and proper facilities on a par with international standards	2020 - 2024 (5 years)	50.0																• Civil Aviation Authority of Thailand

Table A-5 Planned Projects/Measures under Development Framework 5 - Aviation Human Resource Development (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year															Responsible agencies
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	
Development Framework 5 - Aviation Human Resource Development (continued)																				
Framework Component 5.1 - Upgrading the aviation human resource development standards in order to be responsive to business needs (continued)																				
Strategy 3 - Developing and providing support for academic institutes and training centres to be equipped with sufficient and proper facilities (continued)																				
Measures																				
1	Defining a mechanism for acquiring facilities for aviation personnel training	- Objective: To improve the mechanism in acquiring and maintaining facilities for production institutes and aviation personnel training centres - Key Tasks: Improving the mechanism for acquiring and maintaining facilities for production institutes and aviation personnel training centres through utilisation of financial mechanisms such as soft loans, granting tax benefits, etc. - Goal: Production institutes and aviation personnel training centres are equipped with sufficient and proper facilities on a par with international standards	2019 - 2033 (15 years)	-																• Ministry of Finance • Bureau of Budget
2	Building cooperation with international institutions for developing and managing facility standards, as well as encouraging expert exchanges	- Objective: To build cooperation with international institutions for developing and managing facility standards, as well as encouraging expert exchanges - Key Tasks: International institutions for aviation training provide high-quality curricula; therefore, building cooperation with them for developing and managing facility standards, and having expert exchanges will be beneficial for Thailand’s training centres in the long term - Goal: Cooperating with international institutions that develop and promote facility standards	2019 - 2033 (15 years)	-																• Civil Aviation Authority of Thailand
Strategy 4 - Increasing the number of instructors to accommodate demand for aviation human resource																				
Projects																				
	-	-	-	-																-
Measures																				
1	Incentives to increase sufficiently the number of aviation trainers	- Objective: To increase the number of aviation trainers and enhance the capacity of existing trainers - Key Tasks: Implement rules and regulations that accommodate an increase of the number of aviation trainers, which include appropriate remuneration rates, import of foreign trainers, and encouraging retired aviation personnel to become trainers - Goal: Increased number of trainers	2019 - 2021 (3 years)	-																• Civil Aviation Authority of Thailand
Strategy 5 - Establishing aviation human resource production centres in other high-potential regions of the country																				
Projects																				
1	Development of regional airports for flight training	- Objective: To study the feasibility and technical requirements of infrastructure for utilising regional airports for flight training and training of other aviation personnel - Key Tasks: Expansion of flight training centres to other regions, in accordance with the policy to improve flight training and other aviation personnel training, in order to alleviate the lack of trained personnel. The plan focuses on utilising regional airports for flight training and promoting the utilisation of resources, such as airports and facilities, as well as involving concerned industries in the regions and nearby areas - Goal: Concerned agencies responsible, especially the Civil Aviation Training Centre and Department of Airports, apply a development framework for flight and other aviation training into practice	(Pilot project)	-																Primary agencies: • Office of Transport and Traffic Policy and Planning Supporting agencies: • Civil Aviation Training Centre • Department of Airports

Table A-5 Planned Projects/Measures under Development Framework 5 - Aviation Human Resource Development (continued)

No.	Development Framework/ Component/ Strategy / Project/Measure	Details	Timeframe	Total investment (million Baht)	Year														Responsible agencies	
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032		2033
Development Framework 5 - Aviation Human Resource Development (continued)																				
Framework Component 5.1 - Upgrading the aviation human resource development standards in order to be responsive to business needs (continued)																				
Strategy 5 - Establishing aviation human resource production centres in other high-potential regions of the country (continued)																				
Measures																				
1	Revision of regulations on airport and terminal rental to attract the private sector to consider investing in aviation personnel production centres	- Objective: To revise regulations on airport and terminal rental to attract the private sector to consider investing in aviation personnel production centres - Key Tasks: Concerned agencies should revise regulations on airport and terminal rental, especially by extending the rental period up to at least 20 years and providing reasonable renewal conditions, to ensure positive ROI for the private sector when considering investing in aviation personnel production centres - Goal: Revision of regulations on airport and terminal rental to attract the private sector to consider investing in aviation personnel production centres	2019 - 2020 (2 years)	-																• Department of Airports
Framework Component 5.2 - Capacity building of the current workforce in the aviation business																				
Strategy 1 - Continuously enhancing aviation skills and knowledge among public sector personnel working in aviation-related organisations																				
Projects																				
1	Strengthening language skills of personnel in the aviation business	- Objective: To foster and improve language skills of personnel, both in government and the private sector in the aviation business, to be on a par with international standards necessary to become a Global Aviation Hub - Key Tasks: Strengthening language skills of personnel, both in government and the private sector at the basic and technical level, by setting criteria and continuous evaluation that all personnel must achieve minimum requirements - Goal: Aviation personnel, both in government and the private sector, achieve the minimum requirements of a language proficiency test	2020 - 2024 (5 years)	25.0																Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Ministry of Transport (National Transport Policy Committee) • Other agencies related to aviation services
2	Sharing knowledge and technological experience, both at the theoretical and practical level, with personnel in government agencies related to aviation	- Objective: To share the knowledge and experiences of academic experts in the fields of aviation with personnel in concerned government agencies - Key Tasks: Enhancing knowledge and technological experience, both at the theoretical and practical level, of personnel in concerned government agencies - Goal: Personnel in concerned government agencies have sufficient knowledge of aviation and their roles, to apply it to developing plans, projects and measures for future integration	2020 - 2033 (14 years)	10.0 per year A total of 140.0																• Civil Aviation Training Centre
Measures																				
1	Standard setting for the English proficiency level of teachers/instructors	- Objective: To set a standard for the English proficiency level of teachers/instructors on a par with international standards - Key Tasks: Development and setting of a standard English proficiency level for teachers/instructors on a par with international standards, to ensure that they have the required skills in accordance with measures on setting all curricula in English - Goal: Teachers/instructors have the required English proficiency level on a par with international standards	2019 - 2033 (15 years)	-																Primary agencies: • Civil Aviation Authority of Thailand Supporting agencies: • Ministry of education

Remark: * Project under Civil Aviation Training Centre’s plan
■■■■■ indicated on-going operations to achieve long term goal
Source: Analysed by Consultant



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