



# Kaohsiung International Airport 2040 Master Plan

## Summary Report

April, 2023

# Summary



The current master plan continues the rolling review of the "Kaohsiung International Airport 2035 Master Plan" approved by the Executive Yuan in 2018. It aligns with the "Taiwan Civil Airport 2040 (Target Year) System Plan" as the upper-level plan approved by the Executive Yuan in 2021. This master plan is set with the goal year as 2040. It involves a review of the recent changes in the internal and external environmental conditions and the developmental challenges that Kaohsiung International Airport (referred to as KIA) faces. The evaluation provides an integrated strategy for the overall development of KIA, offering a blueprint for future development and a staged construction plan. This plan was approved in accordance with the letter from the Executive Yuan with reference number 1121007245, dated April 17, 2023. Subsequent construction will follow this approval to carry out related projects.

The current master plan positions Kaohsiung Airport as a "southern regional international gateway airport," a "southern regional domestic hub airport," a "base for New Southbound Policy development," and a "base for low-cost carrier development." The predicted target year anticipates a total passenger volume of 14.27 million (international: 12.22 million, domestic: 2.05 million), a total cargo volume of 96,000 metric tons, and a total number of takeoffs and landings reaching 108,000 aircraft movements.

To meet the demands of air travel, Kaohsiung Airport should actively promote the construction of a new terminal building. Additionally, it should continue to advance related projects such as the replacement of international airbridges, the installation of a air condition and power supply for airbridges, improvements to the taxiway system, the construction of a new northern perimeter wall, and the implementation of a next-generation air traffic control system in the southern aviation service park area.

Due to the global impact of the COVID-19 pandemic during this planning timeframe, which has severely affected the aviation industry and related sectors, the next version of master plan is expected to be initiated in a timely manner. The goal for the year 2045 will continue to be monitored, and development projects will be actively pursued in line with the planned direction. This is aimed at enhancing aviation safety, passenger service quality, and the international competitiveness of Kaohsiung Airport, ultimately contributing to the overall development of Kaohsiung and the southern region.



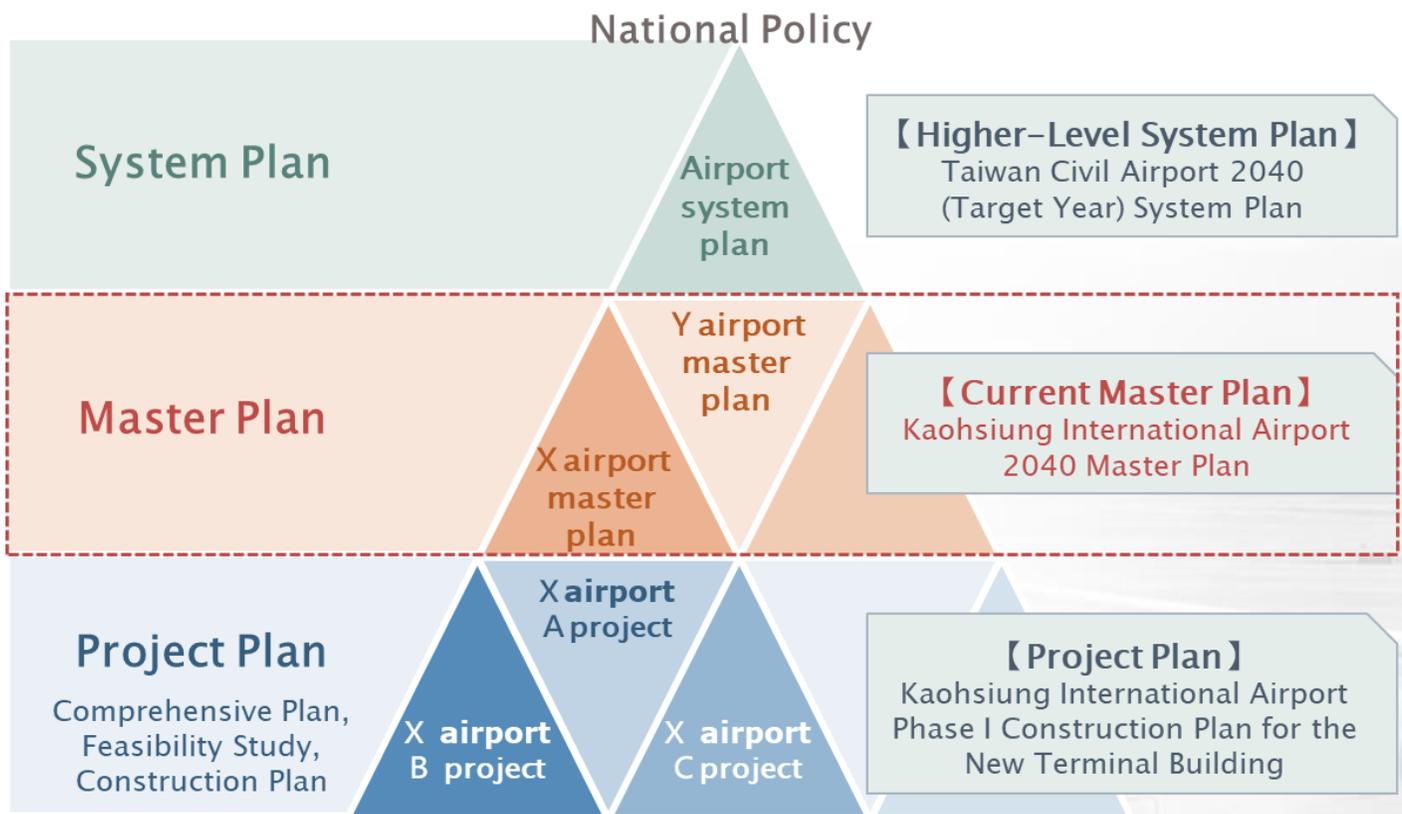
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- 1 Airport Planning Levels
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The **Airport Master Plan** is conducted for the assessment of selecting a new airport site or for the long-term development of an existing airport. It sets the planning goal based on the airport's anticipated capacity requirements for the next 20 years. The plan outlines the **future development vision and blueprint**, taking into consideration conceptual planning that integrates engineering, financial aspects, operations, and environmental sustainability. It presents strategies for the airport's **future development and phased construction planning**.

The Civil Aviation Administration of the Ministry of Transportation and Communications (referred to as the CAA) follows a principle of revising airport master plans every five years in a rolling manner. If there is an unexpected growth in capacity or significant changes in policies and economic conditions, the next phase of the master plan will be initiated earlier to review and adjust the construction projects and timelines of the previous master plan.

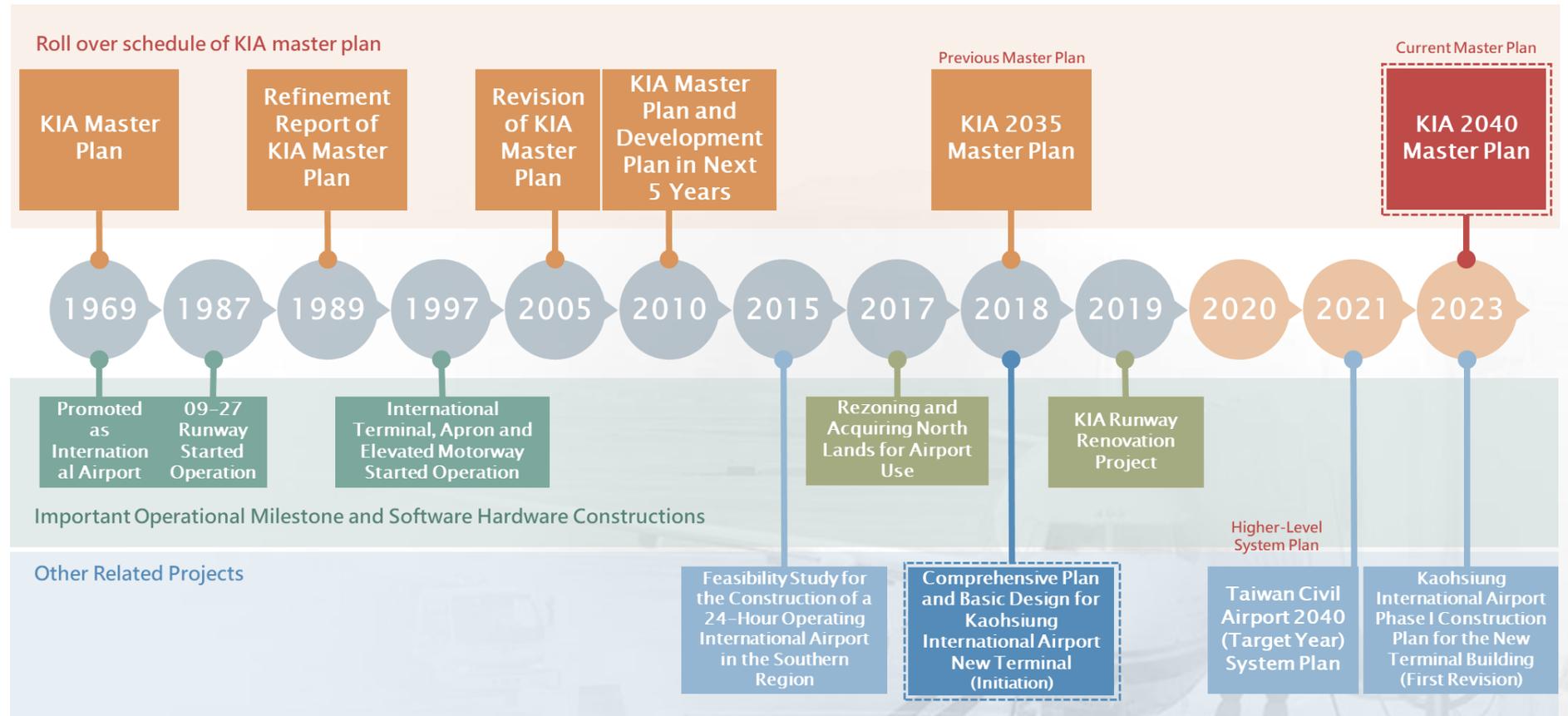
Source: Drawn by current master plan

Figure 1 Airport Planning Levels and Cases

# 01 Planning Background Description | KIA Development Phases

Kaohsiung International Airport, formerly known as "Kominato Airfield" during the Japanese colonial era. In 1965, it was taken over by the CAA, serving domestic air transport services. In 1969, it was upgraded to "Kaohsiung International Airport" and officially started operating international passenger and cargo flights in 1972.

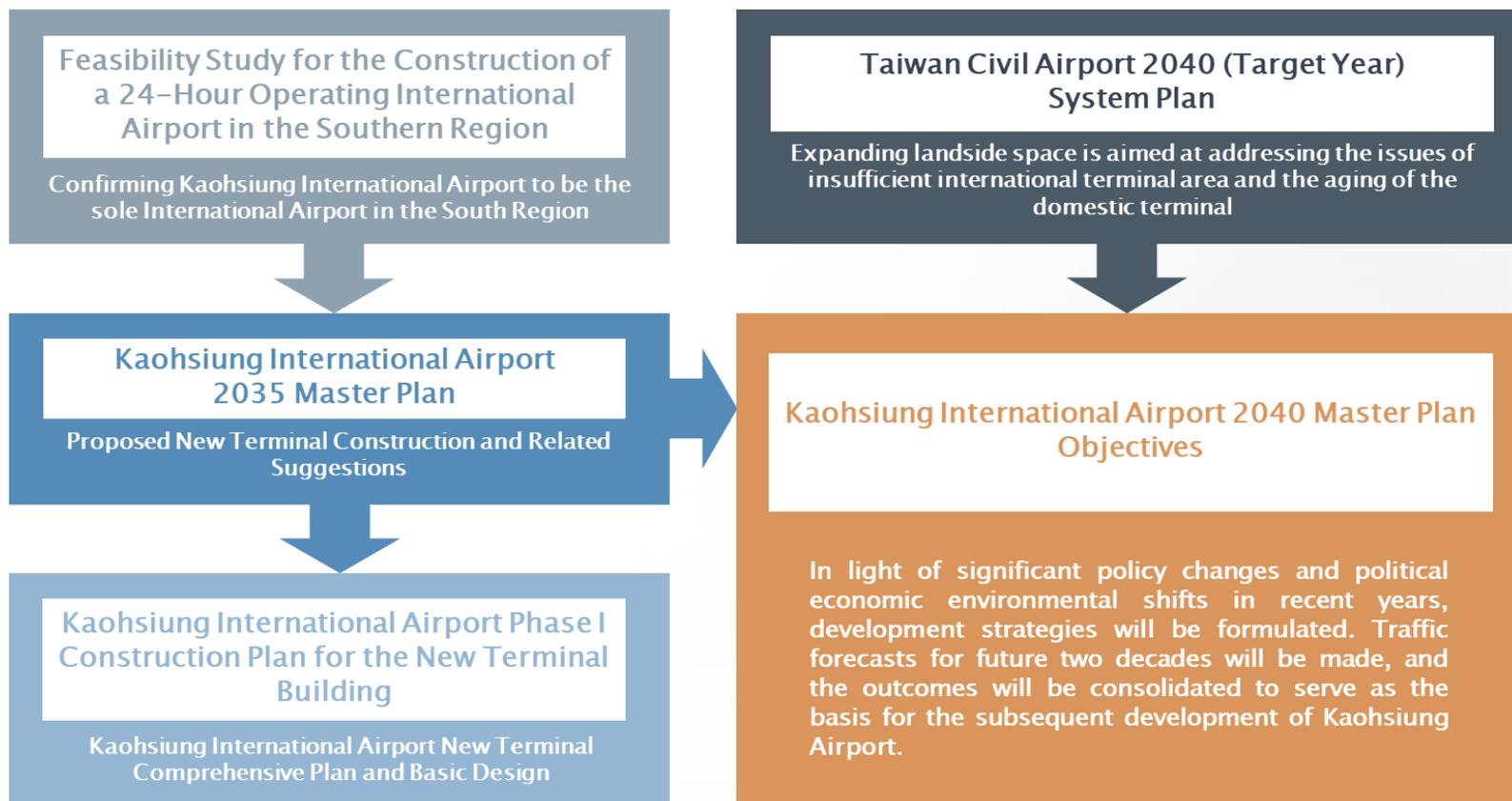
Kaohsiung Airport has conducted a total of six master plans (including refinement and revision plans) to serve as a basis for government decision-making and administration. The most recent master plan approved is the Kaohsiung International Airport 2035 Master Plan which is also the previous version of current master plan.



Source: Organized by current master plan

Figure 2 KIA Development Related Projects and Important Milestone

## 01 Planning Background Description | Objective of Current Master Plan



Source: Organized by current master plan

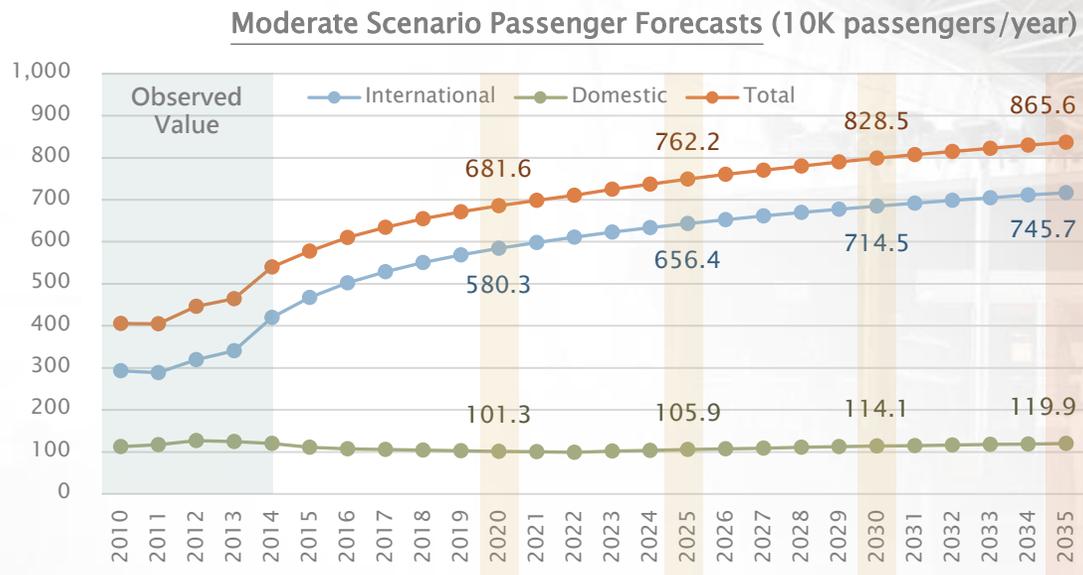
Figure 3 Objective of Current Master Plan

According to the "Feasibility Study for the Construction of a 24-Hour Operating International Airport in the Southern Region," Kaohsiung International Airport has been confirmed to be the sole airport in the south region.

The current master plan is a rolling review based on the "Kaohsiung International Airport 2035 Master Plan", which was approved by the Executive Yuan in 2018. It aligns with the layout directions established in the "Taiwan Civil Airport 2040 (Target Year) System Plan," approved by the Executive Yuan in 2021. The planning target year is 2040, and the plan involves reviewing significant policy changes and changes in the political and economic environment in recent years. It formulates development strategies, predicts future capacity, and presents a blueprint for future development along with phased construction plans. These serve as a reference for the future development of Kaohsiung Airport.

# 01 Planning Background Description | Abstracts of Previous KIA 2035 Master Plan

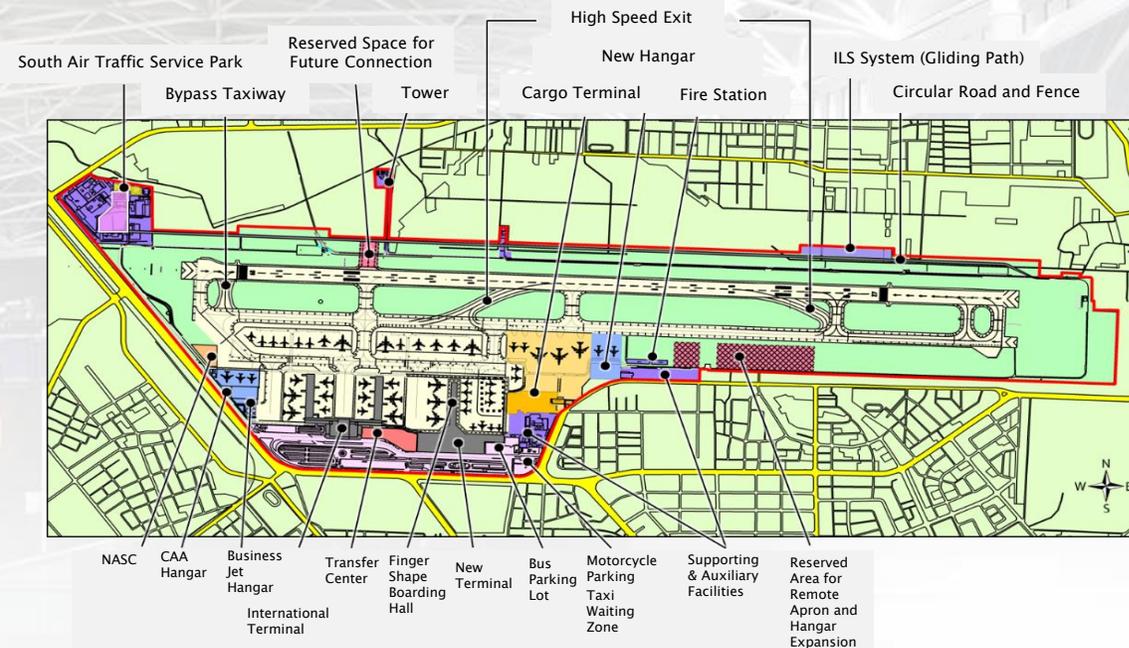
The previous version of the master plan was initiated in 2015 and approved by the Executive Yuan in 2018. This plan set forth four major roles for Kaohsiung Airport, including "Southern Regional International Airport," "Domestic Airport Serving the Eastern Region and Outlying Islands," "Gateway for New Southbound Policy Development," and "Low-Cost Carrier Development Hub." Based on this positioning and market trends, the plan projected that by the target year 2035, Kaohsiung Airport would serve 8.656 million passengers, with 7.457 million on international routes and 1.199 million on domestic routes.



Source : 2035 Master Plan

Figure 4 Traffic Forecasts of Previous Master Plan

In order to meet the demand for the target year, this master plan suggested improvements to the taxiway system, the addition of bypass and high-speed exit taxiways, the demolition of the existing domestic terminal, the construction of a new terminal, the removal of the Uni Air maintenance hangar, the construction of new East and West maintenance hangars, and the development of a new transfer center.



Source : 2035 Master Plan

Figure 5 Future Developing Blueprint of Previous Master Plan



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1

Airport Surrounding Area Environment and Transport System

2

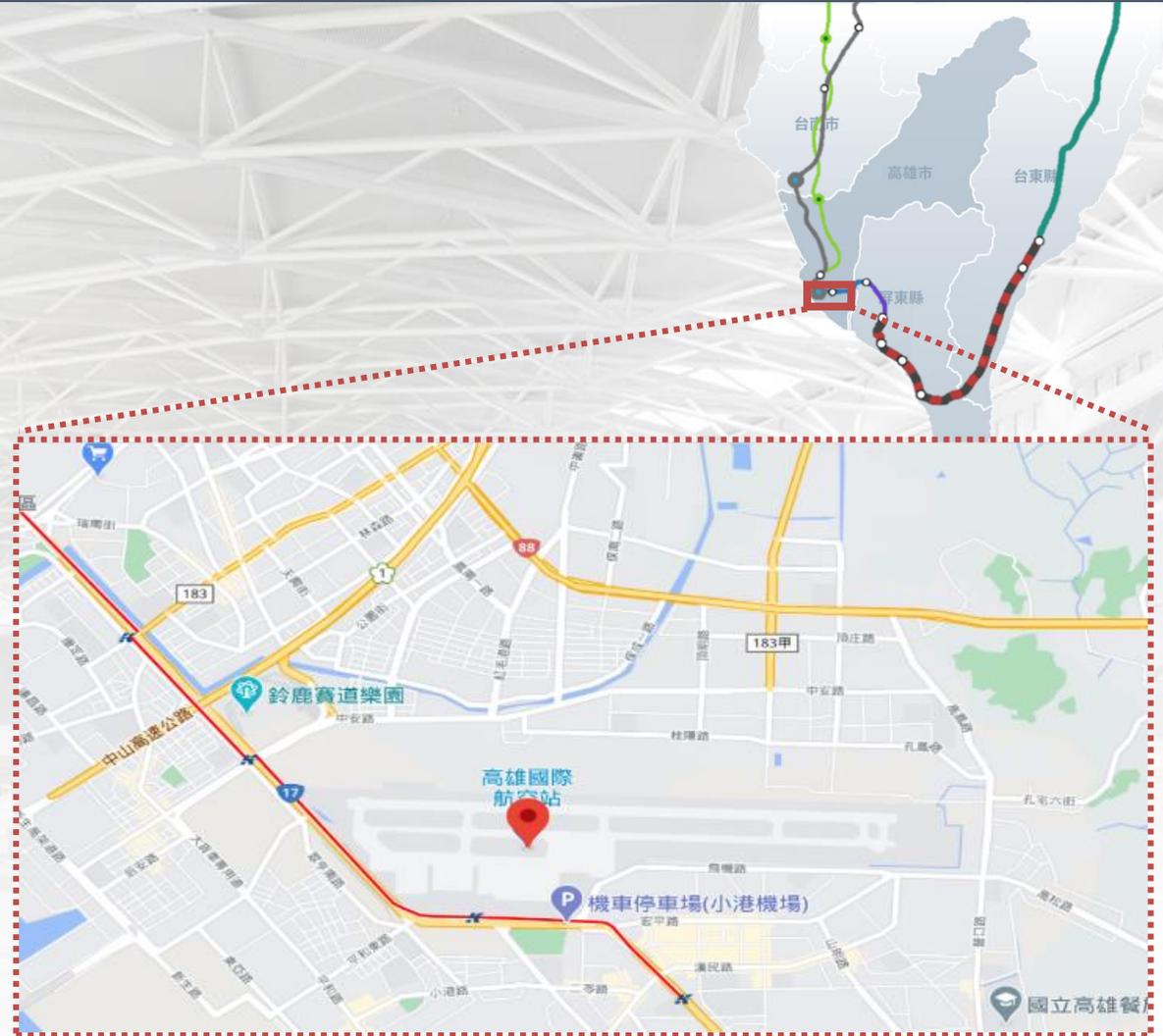
Airport Current Development

## 02 The Analysis of Current Development in the Airport Surrounding Area | Airport Neighboring Environment and Transport System

Kaohsiung Airport is located in the southeastern part of Kaohsiung City, bordering the Taiwan Strait to the west, approximately 3 kilometers from Kaohsiung Port. It is adjacent to the Fengshan hills on the east, which form the southwestern edge of the Fengshan District of Kaohsiung City.

The transportation network around Kaohsiung Airport primarily consists of highways on the west and south sides, including **National Highway 1** and **Jhongsan Fourth Road**. Secondary road systems include the **88 Expressway**, **Jhong'an Road**, **Gaofeng Road**, and **Feiji Road** on the north and east sides. The airport is well connected to Kaohsiung city center and Kaohsiung harbor through within 10 minutes through current road system.

The public transportation system is primarily based on rail transport, with the **Red Line of the metro system** passing through the southern side of the airport. The "R4 Kaohsiung International Airport Station" is located at Kaohsiung Airport and provides access to the International Terminal, Domestic Terminal, on-site parking facilities, and Kaohsiung Park via a total of seven entrances and exits. Travelers can connect to the north to reach the **Taiwan Railways Kaohsiung Station** (a 18-minute ride) and the **Taiwan High-Speed Rail Zuoying Station** (a 28-minute ride).



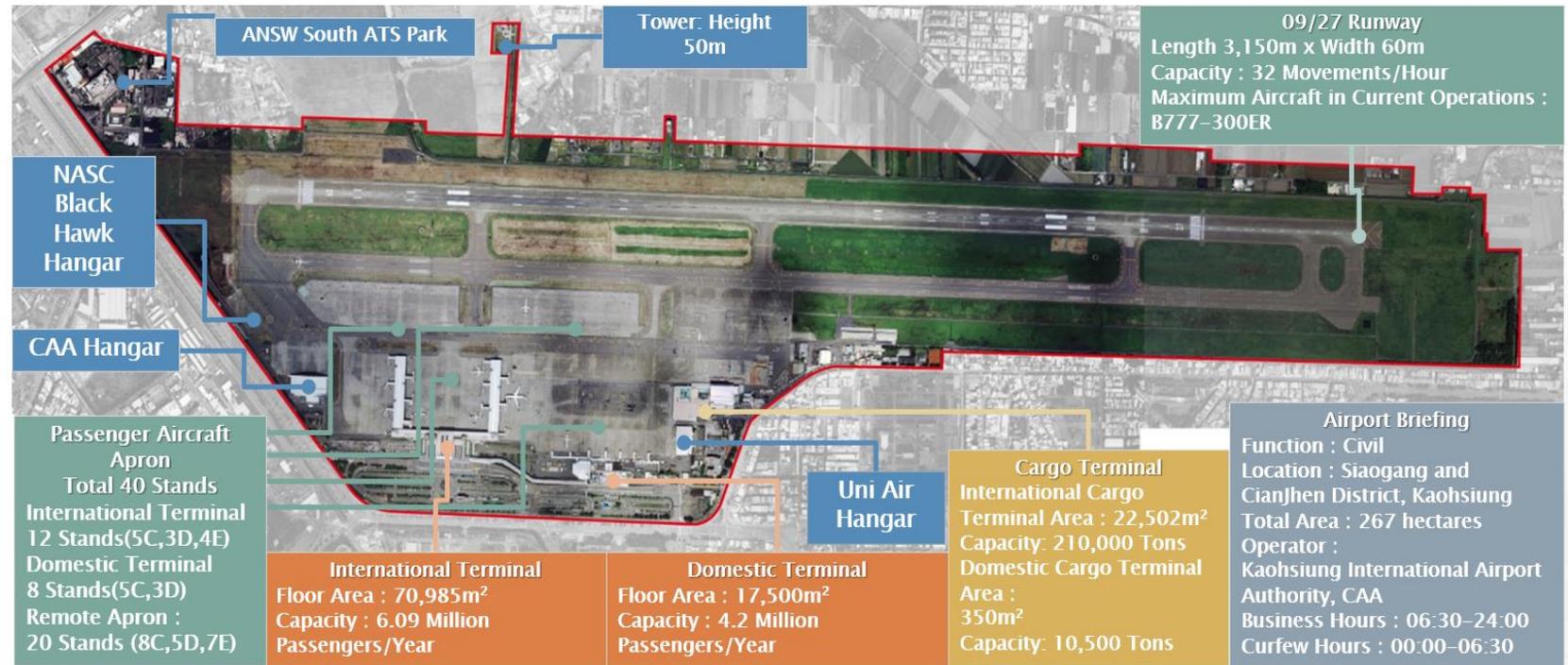
Source: Drawn by current master plan

Figure 6 Geographical Location of KIA

## 02 The Analysis of Current Development in the Airport Surrounding Area | Airport Current Development – Facilities and Layout

The airport covers a total area of 267 hectares, which is operated by Kaohsiung International Airport Authority, CAA.

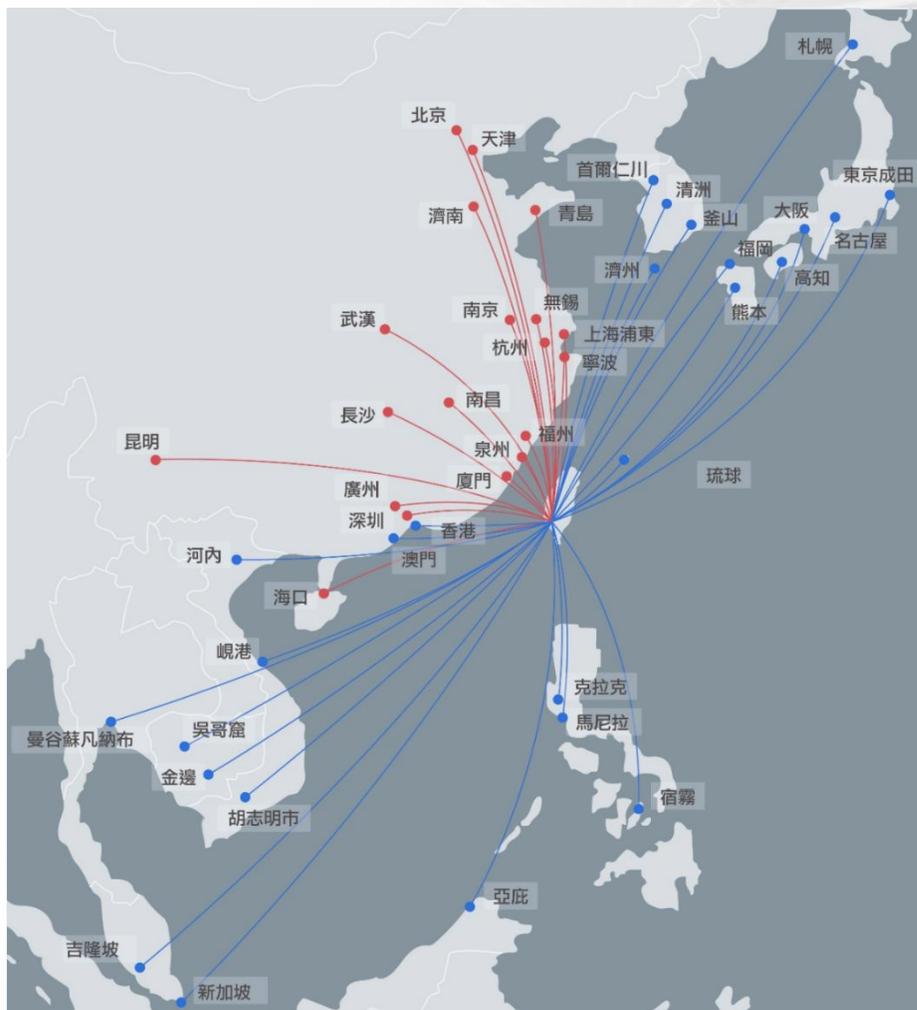
There's **one** runway (length 3,150 meters, width 60 meters, 32 movements per hour). The passenger aircraft apron could accommodate 40 stands. Also, there's **one** international passenger terminal (accommodate 6.09 million passenger per year), **one** domestic passenger terminal (accommodate 4.20 million passenger per year), **one** international cargo terminal (accommodate 210,000 tons per year) and **one** domestic cargo terminal (accommodate 10,500 tons per year). Facility configuration refer to Figure 7.



Source: Drawn by Current Master Plan

Figure 7 Current Facility Configuration in KIA

## 02 The Analysis of Current Development in the Airport Surrounding Area | Airport Current Development – Routes and Networks



Source: Drawn by current master plan

Figure 8 KIA International Network Map in 2019

Kaohsiung Airport is also the primary **domestic route** airport in the southern region. There is one domestic route to Hualien, as well as 4 routes to **outlying islands**, including Kinmen, Penghu, Cimei, and Wang'an. Among these, the Cimei and Wang'an routes are essential subsidized routes, providing basic transportation services for residents of remote islands.

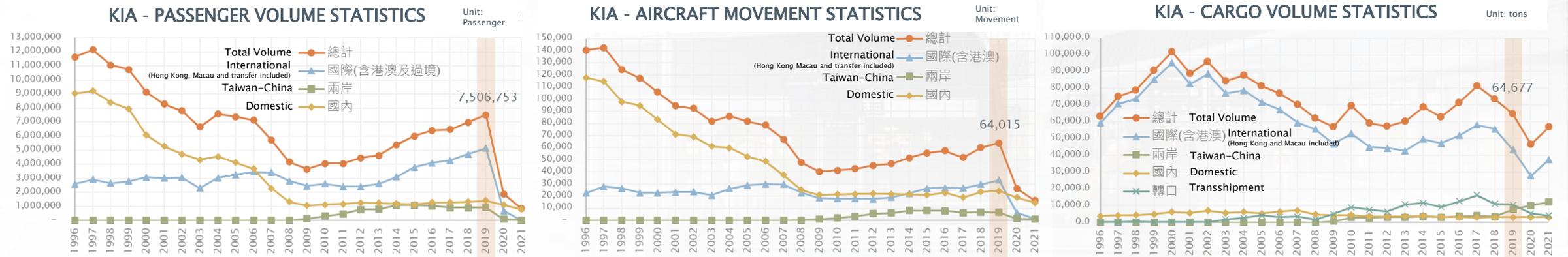
In addition to domestic routes, Kaohsiung Airport is the second busiest international airport in Taiwan, with its international flight network covering Southeast Asia, Northeast Asia, China, and the Hong Kong–Macau region. In 2019, Kaohsiung Airport had **37 scheduled routes**, including 21 international and Hong Kong–Macau routes and 16 cross-strait routes. In addition to scheduled routes, Kaohsiung Airport also provided 13 charter routes, including 9 international routes and 4 cross-strait routes. According to the statistics in 2019, Kaohsiung Airport has successfully launched routes to 9 new destinations in Southeast Asia through **low-cost carriers**, including Manila, Bangkok Suvarnabhumi, Singapore, Kuala Lumpur, Cebu, Danang, Clark, Hanoi, and Ho Chi Minh City.

## 02 The Analysis of Current Development in the Airport Surrounding Area | Airport Current Development – Operation Statistics

The passenger volume and aircraft movements at Kaohsiung Airport reached their peak in 1997, approximately three-quarters were domestic flights. However, due to the opening of the Taiwan High-Speed Rail in 2007, a gradual decline in domestic flight volumes, reaching a low point in 2009.

Kaohsiung Airport saw a resurgence in passenger traffic in 2019, reaching 7.5 million passengers. Among them, international and cross-strait flight passengers numbered 6.08 million, while domestic flight passengers totaled 1.42 million. The airport recorded 64,000 aircraft movements, with nearly 40,000 of them being international flights and over 24,000 being domestic flights. During 2020 and 2021, Kaohsiung Airport experienced significant reductions in passenger volume due to the severe impact of the COVID-19 pandemic.

The airport's cargo operations had been in a relatively sluggish state for an extended period, with overall cargo volumes fluctuating between 60,000 to 80,000 metric tons since 2007. In recent years, there has been a gradual increase in transshipment cargo, but no significant overall growth. However, in 2020 and 2021, the COVID-19 pandemic influenced a shift in the cargo business, resulting in growth.



Source: Drawn by current master plan

Figure 9 KIA Historical Traffic Statistics



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<b>04</b>	<b>Future Development and Positioning of KIA</b>	<b>1</b> Higher-Level Plan Review
<b>05</b>	<b>Air Passenger and Cargo Volume Forecasting</b>	<b>2</b> Trends in International Aviation Market
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## 03 Higher-Level Plans, Relevant Projects, and External Environmental Analysis | High-Level Plan Review

The higher-level plan dealt with the overall development of Taiwan's civil airports by 2040, known as the "Taiwan Civil Airport 2040 (Target Year) System Plan." This plan envisions making Taiwan's 17 airports the "Most Competitive Airport Groups in East Asia" and sets the national airport development goals as "Diverse Gateways, Regional Co-Prosperity".

Kaohsiung Airport is listed as the "regional gateway airport" in the higher-level plan which also designated KIA as the "Southern Regional International Gateway", "Southern Regional Domestic Gateway", and "Auxiliary Airport for Southern Region Air Cargo Development". The plan recommended KIA to expand the terminal and apron, introduce airport technology, and strengthen collaboration with local authorities. For more information on development functions, goals, and principles, please refer to Figure 10.

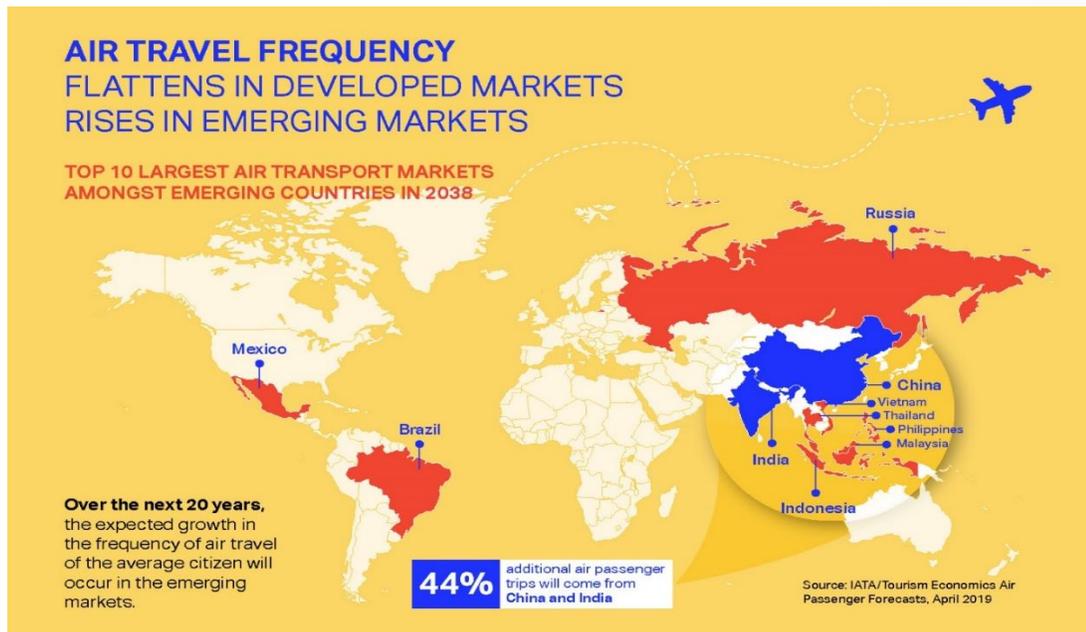


Source: Taiwan Civil Airport 2040 (Target year) System Plan ,May 2021; Drawn by current master plan

**Figure 10 Higher-Level Plan Development Functions and Goals, Development Targets – Kaohsiung International Airport**

## 03 Higher-Level Plans, Relevant Projects, and External Environmental Analysis | Trends in International Aviation Market

During 2018–2038, 44% of global air travel will come from two major countries, China and India. The international route volumes in the surrounding regions will also thrive due to the rapid economic and travel activities in these two countries. In the Asia-Pacific region, China's air transport market is expected to achieve a 20-year compound annual growth rate of 11%, India at 10%, and Indonesia at 9%. These three countries are also the top three in terms of population in Asia. Apart from Indonesia, the Southeast Asian countries with relatively rapid growth include Vietnam(8%), Thailand(7%), Malaysia(5%), and Philippines(5%).

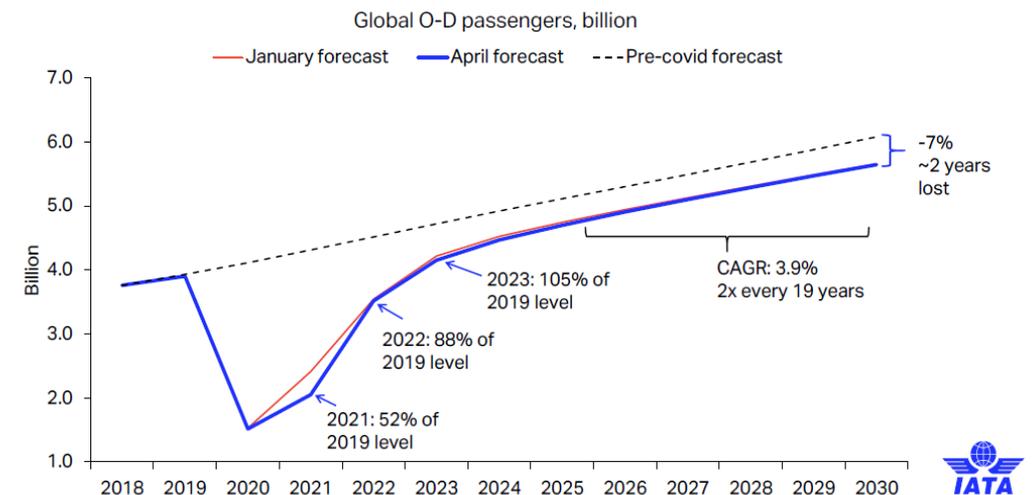


Source: IATA 「Air Passenger Forecasts Global Report」, Oct. 2019.

Figure 11 IATA Global Air Traffic Forecasting Before Pandemic

After the outbreak of COVID-19, IATA readjusted its volume forecasts. Analyzing data from the global aviation transport industry in June 2020, it was expected that the impact of the pandemic would last for five years. It was projected that the RPK (Revenue Passenger Kilometers) in aviation transport might only recover to the 2019 level by 2024. However, due to a quicker recovery in short-haul domestic routes or regional flights, the total number of passengers could potentially return to the 2019 level by 2023.

**We estimate COVID-19 long-term loss of 2 years growth**  
Strong rebound when border travel barriers removed but not full recovery



Source: IATA Economics using data from Tourism Economic/IATA Air Passenger Forecast, April 2021.

Source: IATA 「COVID-19 Outlook for air travel and air cargo markets」, Jun. 2021.

Figure 12 IATA Forecasting of Short, Mid-to-Long Term Recovery After Pandemic

## 03 Higher-Level Plans, Relevant Projects, and External Environmental Analysis | Trends in Future Airport Development

Before the occurrence of the COVID-19 pandemic, the aviation transport industry was already facing several significant changes. These changes included the gradual exit of large twin-aisle four-engine aircraft from the market, with twin-aisle twin-engine planes becoming mainstream for transoceanic flights. The use of regional airports for direct flights by small single-aisle aircraft had also become a trend in industry development, and vertical takeoff and landing multi-axis rotor electric aircraft had begun experimental flights.

Among all developing trends, the most prominent developments included the focus on **smart airports**, **green airports**, and **resilient airports**. These development trends are now organized in figure 13.

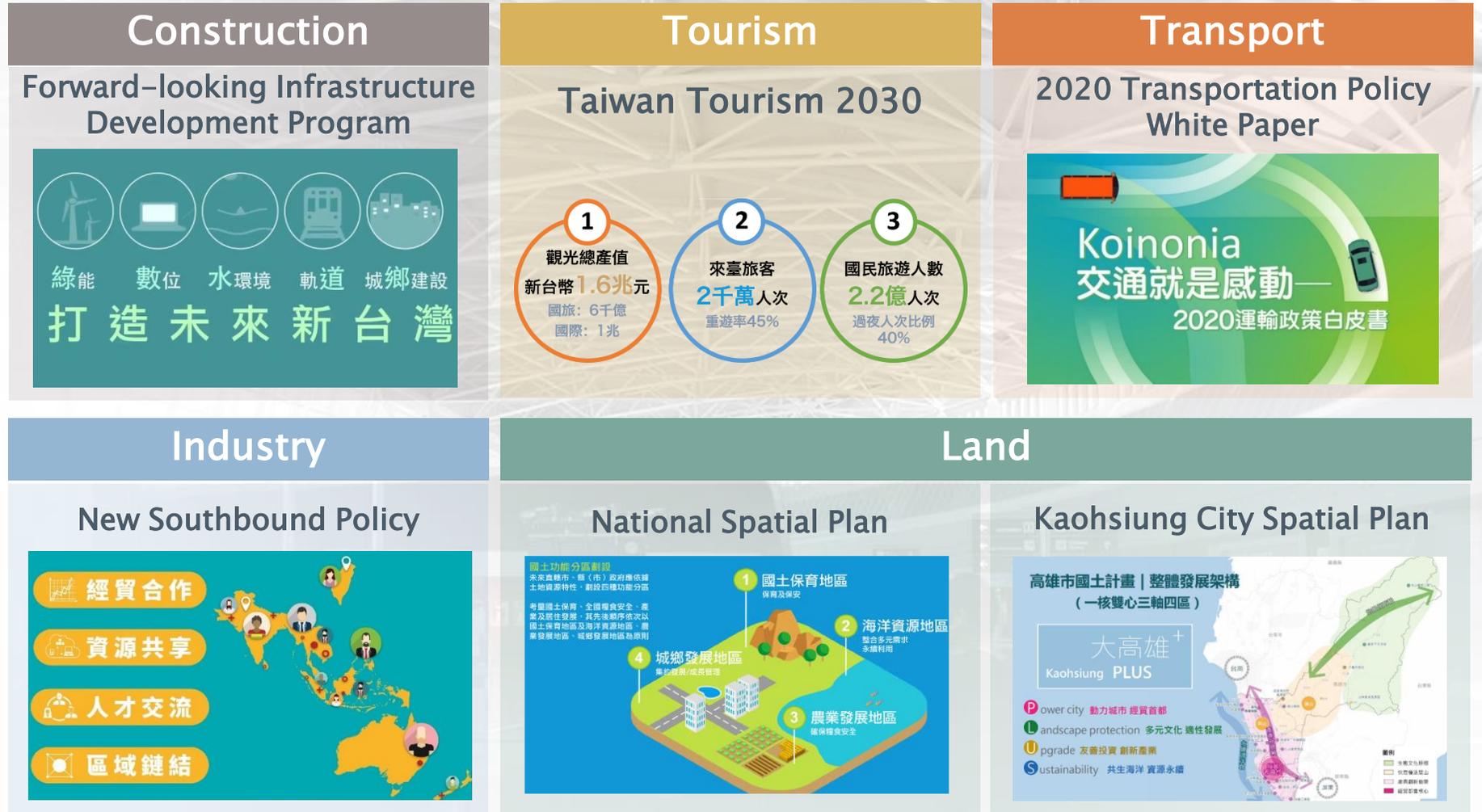


Source: Organized by current master plan

Figure 13 Future Airport Developing Trends –Smart, Green, and Resilience

# 03 Higher-Level Plans, Relevant Projects, and External Environmental Analysis | Current Major Government Policies

The current major government policies have been consolidated in this master plan to serve as the basis for discussing airport positioning and complementary development strategies. These policies include the New Southbound Policy, Forward-looking Infrastructure Development Program, 2020 Transportation Policy White Paper, Taiwan Tourism 2030, the six core strategic industries, National Spatial Planning, and Kaohsiung City Spatial Planning, etc. (refer to Figure 14).



Source: Drawn by current master plan

Figure 14 Current Major Government Policies

# 03 Higher-Level Plans, Relevant Projects, and External Environmental Analysis | Southern Region Development Projects

This master plan consolidates the future major construction and development projects in Kaohsiung City and the surrounding areas, which include the relationships between these projects and current master plan.



Source: Drawn by current master plan

Figure 15 Development Plan in the Southern Region



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## 04 Future Development and Positioning of KIA | KIA Functional Positioning

The previous version of Kaohsiung Airport master plan assigned four main roles to Kaohsiung Airport, which are: **Southern Regional International Airport**, **Gateway for New Southbound Policy Development**, **Low-Cost Carrier (LCC) Development Hub**, **Domestic Airport Serving the Eastern Region and Outlying Islands**.

Higher-Level Plan has also set future development goals for Kaohsiung airport. These goals are **Southern Region International Route Gateway**, **Southern Regional Domestic Route Gateway**, and **Supporting Airport of Air Cargo in the Southern Region**.

In alignment with the objectives and differences in domestic and international environments, the current master plan 2040 renews four key future development roles for Kaohsiung Airport, including **Southern Regional International Gateway Airport**, **Southern Regional Domestic Hub Airport**, **New Southbound Policy Development Base** and **Low-Cost Carrier (LCC) Development Hub**, as shown in Figure 16.



Source: Drawn by current master plan

Figure 16 KIA Functional Positioning



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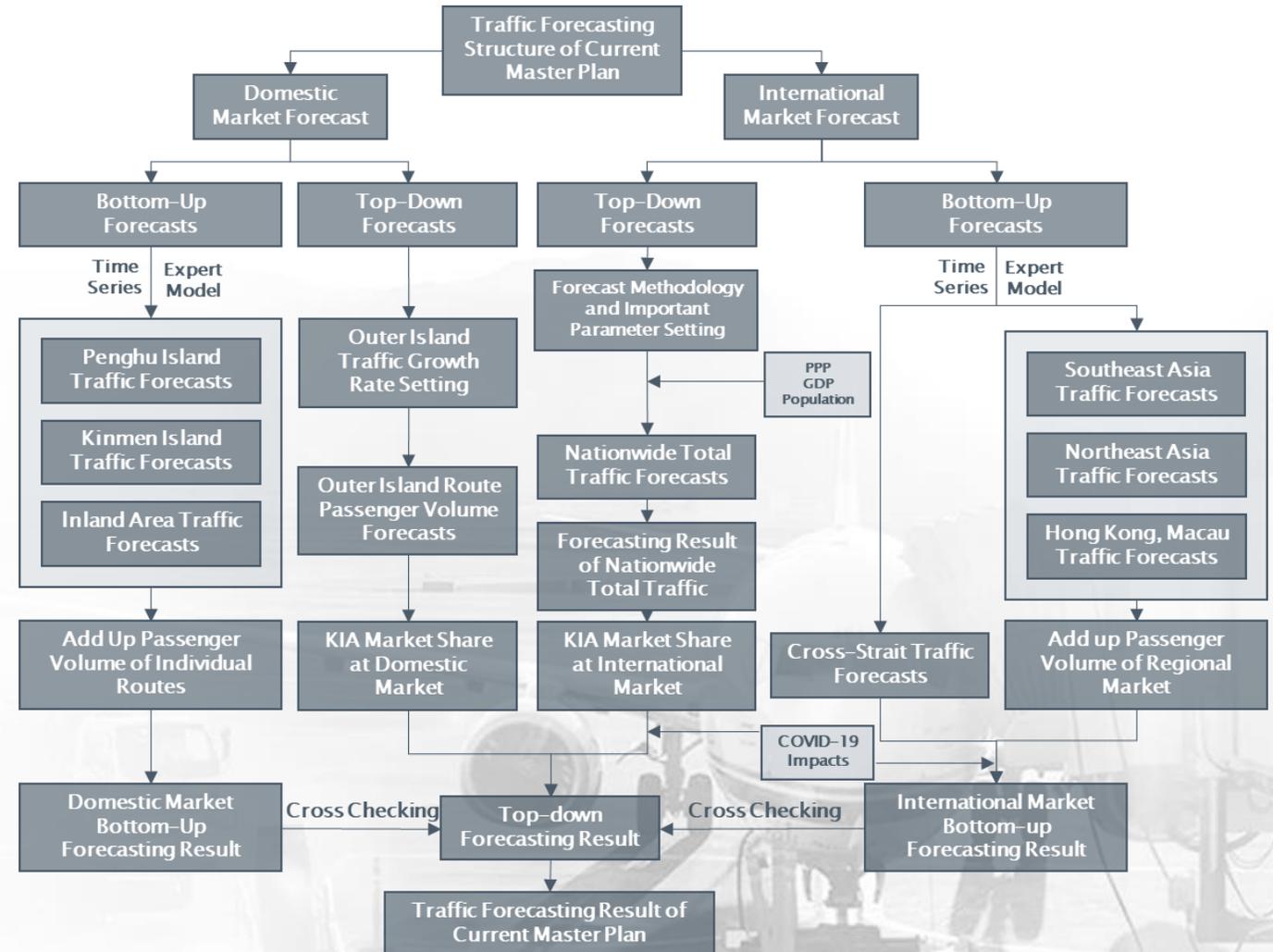
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## 05 Air Passenger and Cargo Volume Forecasting | Traffic Forecasting Framework of Current Master Plan

The volume predictions in this current master plan are divided into four categories: international passenger volume, international cargo volume, domestic passenger volume, and domestic cargo volume.

Passenger volume is estimated using two methods: the "Top-Down" total volume distribution model and the "Bottom-Up" time series model. The results from both methods are cross-checked, taking into account the short-term impact of the COVID-19 pandemic.

For cargo volume prediction, the **growth rate** method is employed. The development of cargo volume at Kaohsiung Airport over the years has shown an unstable pattern, and it does not exhibit a clear correlation with aircraft movements, economic growth rates, population changes, or industrial development. Therefore, the forecast for cargo volume at Kaohsiung Airport relies on the growth rate method, following the approach of the previous master plan and the upper-level plan.



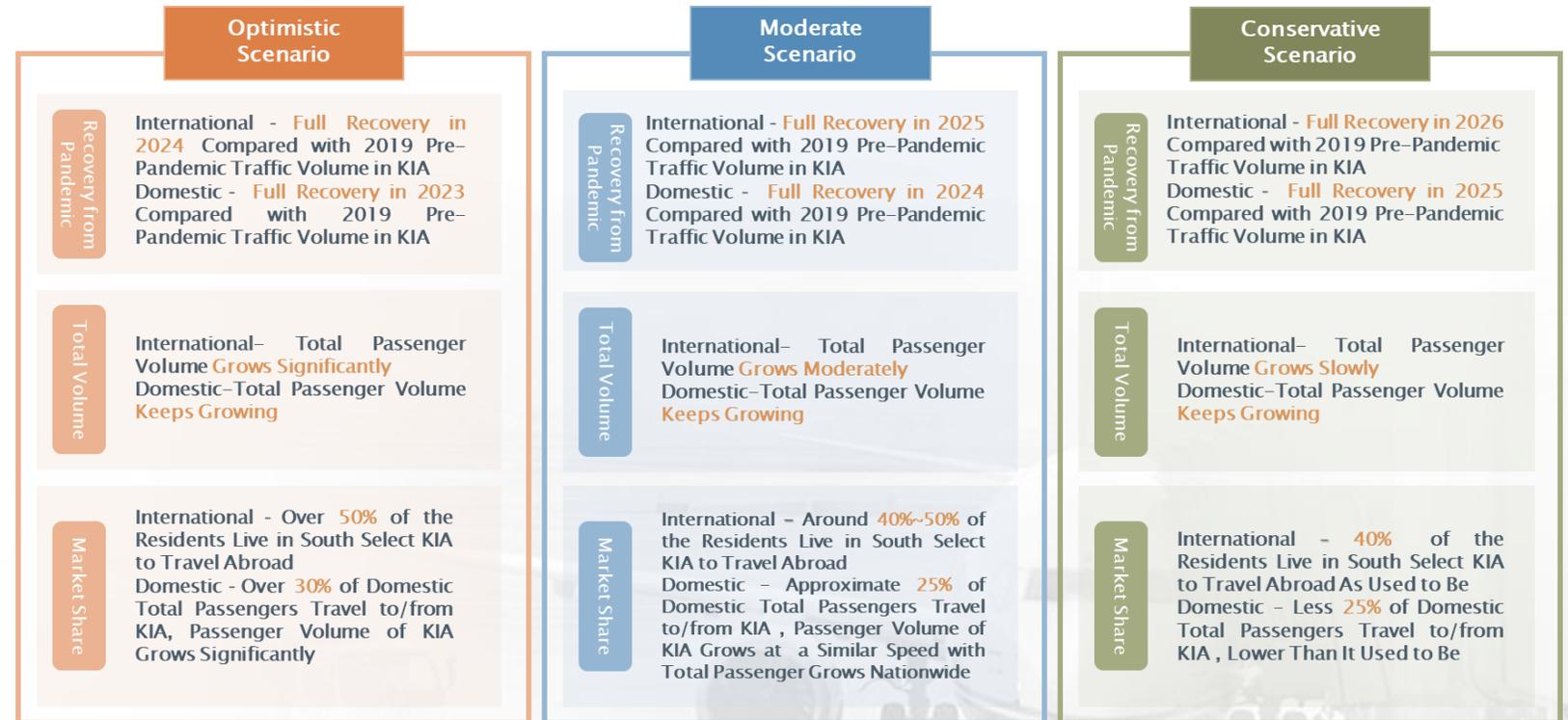
Source: Drawn by current master plan

Figure 17 Traffic Forecasting Framework

## 05 Air Passenger and Cargo Volume Forecasting | Scenario Assumptions

For this master plan, optimistic, moderate, and conservative scenarios are designed based on different assumptions.

In the moderate scenario, for **international** routes, it is assumed that the traffic levels will not recover to the 2019 levels **until 2025**. Afterward, the overall national traffic is expected to experience **moderate growth**, with a higher proportion of residents in the southern region using Kaohsiung Airport compared to the current situation but **not exceeding 50%**. For **domestic** routes, the impact of the pandemic is expected to be less severe, and **by 2024**, traffic volume should recover to the 2019 levels. Overall, national traffic will continue to **grow**. The long-term market share is not expected to undergo significant changes and will be maintained at the existing 25% market share level.



Source: Organized by current master plan

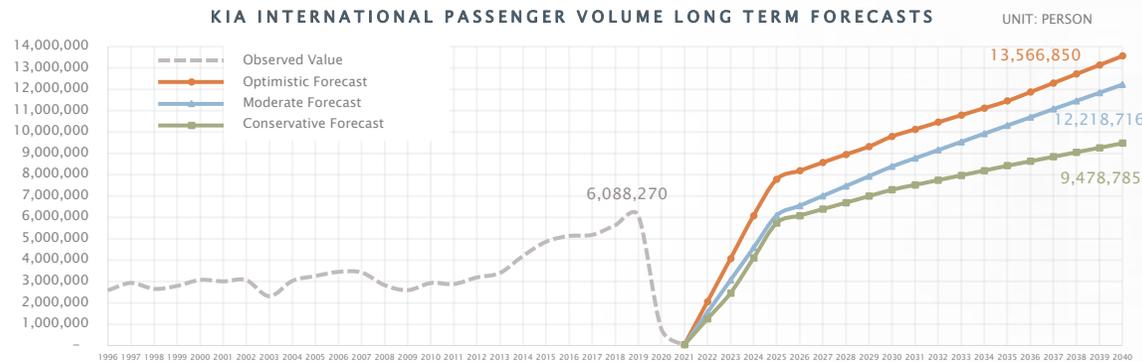
Figure 18 Traffic Forecasting Scenarios

# 05 Air Passenger and Cargo Volume Forecasting | International Traffic Forecasts

For the international passenger volume, the moderate prediction is established at **12.22 million passengers**. The conservative prediction is set at **9.48 million passengers**. The optimistic prediction is set at **13.57 million passengers** while the speed of post pandemic recovery and traffic growth is faster than other scenarios.

**Table 1 International Passenger Volume Forecasts**

2019 (Base Year Observation)	Year Scenarios	International Routes - Traffic Forecasts Result (Passengers/year)			
		2025	2030	2035	2040
6,088,270 (Passengers)	Conservative	5,741,038	7,301,314	8,422,511	9,478,785
	✓ Moderate	6,088,270	8,382,723	10,300,720	12,218,716
	Optimistic	7,787,865	9,798,772	11,452,755	13,566,850
2035 Master Plan	Moderate	6,564,000	7,145,000	7,457,000	-
2040 System Plan		9,340,000	10,920,000	11,760,000	12,570,000

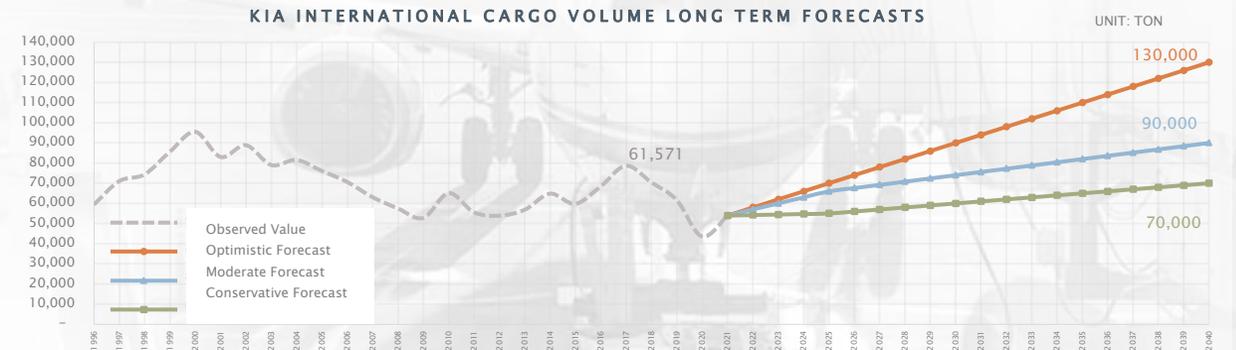


**Figure 19 International Passenger Volume Forecasts**

In the forecast for international cargo volume, the average annual growth rate will be 4% under the moderate scenario. This could potentially bring the cargo volume back to the peak of around **90,000 tons** seen in the past two decades. The optimistic estimate suggests an average annual growth rate of 8%, resulting in a cargo volume of **130,000 tons**. However, if the market remains volatile, the conservative estimate assumes an average annual growth rate of 2%, leading to a cargo volume of **70,000 tons**.

**Table 2 International Cargo Volume Forecasts**

2019 (Base Year Observation)	Year Scenarios	International Route - Cargo Volume Forecasts (10,000 Tons/Year)			
		2025	2030	2035	2040
6.2 (10,000 Tons)	Conservative	5.5	6.0	6.5	7.0
	✓ Moderate	6.6	7.4	8.2	9.0
	Optimistic	7.0	9.0	11.0	13.0
2035 Master Plan	Moderate	9.7	10.8	11.5	-
2040 System Plan	CAGR 1.8%	6.9	7.5	8.2	9.0



**Figure 20 International Cargo Volume Forecasts**

# 05 Air Passenger and Cargo Volume Forecasting | Domestic Traffic Forecasts

While domestic market have also been affected by COVID-19, the impact has been relatively mild compared to international market, and the expected recovery rate is faster. In current master plan, the moderate estimate is set at **2.053 million passengers**. The optimistic estimate for domestic passenger at Kaohsiung Airport is set at **2.445 million passengers**. The conservative estimate is set at **1.403 million passengers**.

Table 3 Domestic Passenger Volume Forecasts

2019 (Base Year Observation)	Year Scenarios	Domestic Routes - Traffic Forecasts Result (Passengers/year)			
		2025	2030	2035	2040
1,418,483 (Passengers)	Conservative	1,403,001	1,403,001	1,403,001	1,403,001
	Moderate	1,594,816	1,757,794	1,904,783	2,053,366
	Optimistic	1,894,579	2,090,153	2,266,539	2,444,839
2035 Master Plan	Moderate	1,059,000	1,141,000	1,199,000	-
2040 System Plan		1,600,000	1,770,000	1,890,000	2,030,000

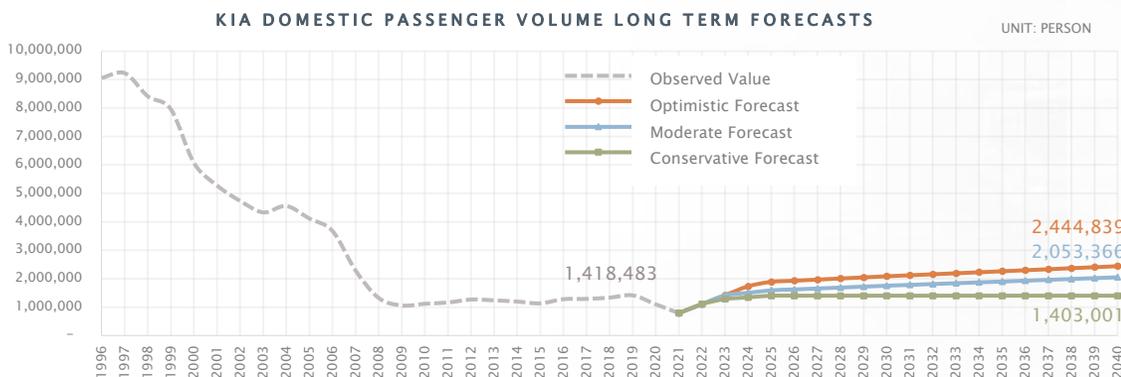


Figure 21 Domestic Passenger Volume Forecasts

Regarding domestic cargo volume, the current master plan forecasts a potential gradual increase to **6,000 metric tons**, assuming an average annual growth rate of 5%. In an optimistic scenario, where the annual average growth rate is set at 8%, the domestic cargo volume could reach **7,800 metric tons**. For a more conservative estimate, an annual growth rate of 1% is used, resulting in a domestic cargo volume of **3,600 metric tons**.

Table 4 Domestic Cargo Volume Forecasts

2019 (Base Year Observation)	Year Scenarios	Domestic Route - Cargo Volume Forecasts (Tons/Year)			
		2025	2030	2035	2040
3,106 (Tons)	Conservative	3,150	3,300	3,450	3,600
	Moderate	3,750	4,500	5,250	6,000
	Optimistic	4,200	5,400	6,600	7,800
2035 Master Plan	Moderate	3,000	4,000	4,000	-

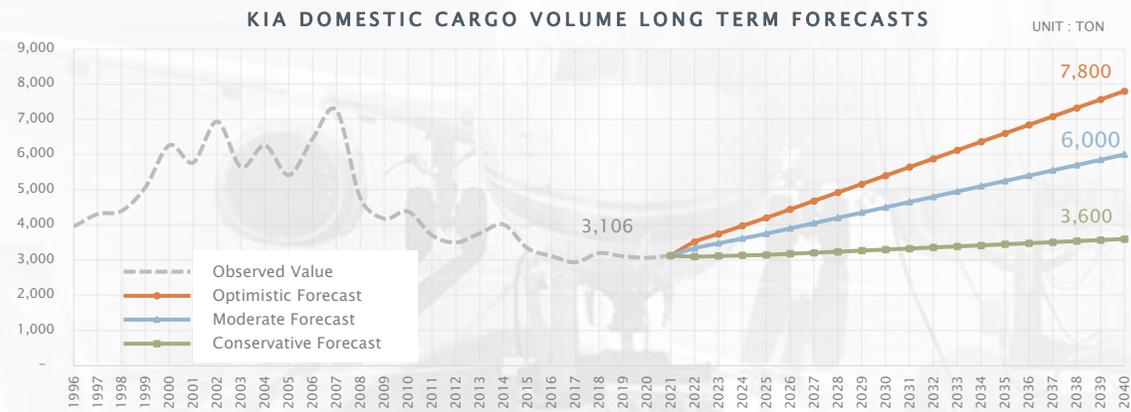


Figure 22 Domestic Cargo Volume Forecasts

## 05 Air Passenger and Cargo Volume Forecasting | Summary of Forecasts

As for international routes, it is expected that by 2040, the average seating capacity of Category C aircraft will reach 200 passengers, while Category E aircraft will have an average seating capacity of over 300 passengers, and the proportion of **Category C and Category E** aircraft at Kaohsiung Airport will be **80:20**, and the annual passenger **load factor** can be maintained at around **80%**. The estimated number for international flights under different scenarios are as follows: **55,758 flights** for conservative scenario, **71,875 flights** for moderate scenario, and **79,805 flights** for optimistic scenario.

Kaohsiung Airport's domestic flights are expected to primarily use the ATR 72 aircraft in the future. Therefore, the number of annual domestic flights under different scenarios is estimated based on the seating capacity of the ATR 72 aircraft and the average passenger **load factor** for domestic routes (**80%**). The estimated figures for the target year under different scenarios are as follows: **25,054 flights** for conservative scenario, **36,668 flights** for moderate scenario, and **43,658 flights** for optimistic scenario.

Table 5 Aircraft Movement Forecasts

Scenarios	Route	Item	Forecasts			
			2025	2030	2035	2040
Optimistic	Domestic	Passenger Volume(10K persons)	189.5	209.0	226.7	244.5
		Aircraft Movement (per movement)	33,832	37,325	40,474	43,658
	Int'l	Passenger Volume(10K persons)	778.8	979.9	1,145.3	1,356.7
		Aircraft Movement (per movement)	45,811	57,640	67,370	79,805
	Total	Passenger Volume(10K persons)	968.2	1,188.9	1,371.9	1,601.2
		Aircraft Movement (per movement)	79,643	94,965	107,844	123,463
Moderate	Domestic	Passenger Volume(10K persons)	159.5	175.8	190.5	205.3
		Aircraft Movement (per movement)	28,479	31,390	34,014	36,668
	Int'l	Passenger Volume(10K persons)	608.8	838.3	1,030.1	1,221.9
		Aircraft Movement (per movement)	35,814	49,311	60,593	71,875
	Total	Passenger Volume(10K persons)	768.3	1,014.1	1,220.6	1,427.2
		Aircraft Movement (per movement)	64,293	80,701	94,607	108,543
Conservative	Domestic	Passenger Volume(10K persons)	140.3	140.3	140.3	140.3
		Aircraft Movement (per movement)	25,054	25,054	25,054	25,054
	Int'l	Passenger Volume(10K persons)	574.1	730.1	842.3	947.9
		Aircraft Movement (per movement)	33,771	42,949	49,545	55,758
	Total	Passenger Volume(10K persons)	714.4	870.4	982.6	1,088.2
		Aircraft Movement (per movement)	58,825	68,003	74,599	80,812

Source: Organized by current master plan



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## 06 The Capacity of Airport Facilities and Demand Analysis | Check Lis of Facility Capacity and Traffic Demand

Based on the analysis of traffic forecasts, an estimation has been made regarding the demands for various airside and landside facilities in the target year. The results of the review of facility requirements for Kaohsiung Airport in the target year are detailed in Table 6.

**Table 6 Check List of Facility Capacity and Traffic Demand**

Runway and taxiway system	Runway	Sufficient	① Geometry Design : There is insufficient width in some areas on the northern side of the runway. ② Runway Capacity : The announced capacity is sufficient to meet this demand.
	Taxiway	Improvement on Taxiway Geometry Layout and Aged Taxiway Surface	① Geometry Design: Gradually widening the turning area of the taxiway ② Maintenance: Some taxiway surfaces already show signs of aging, ruts, and cracks, indicating the need for necessary surface reconstruction.
Apron	International	Insufficient Quantity	The current number of parking stands is insufficient to meet the demand for international flights for the target year.
	Domestic	Sufficient Quantity	All parking stands will be reconfigured and adjusted in line with the construction of the new terminal.
Passenger Terminal	International	Insufficient Capacity	The terminal area and various facilities (such as traditional/self-service check-in counters, security checks, etc.) all need expansion.
	Domestic	Sufficient Terminal Space	Due to the old buildings, the space and layout are not conducive to efficient use.
Cargo Terminal	International	Sufficient Space and Processing Capability	The annual processing capacity can meet the demand.
	Domestic	Sufficient Space and Processing Capability	The buildings are old, and the space is somewhat cramped.
Transportation Facility	Parking Spaces	Insufficient Quantity	With the construction of the new terminal and the addition of parking spaces, the parking capacity will meet the demand for the target year.
Supporting Facility	Hangar	Sufficient Quantity	The base carrier, Uni Air, does not have expansion requirements, and other operators do not use Kaohsiung Airport as their primary maintenance base.
	Business Jet Hangar	Insufficient Quantity	The current number of hangars is insufficient to meet the service demand.
	Fire Station	AD Category for Fire Fighting Meet Requirements	The existing fire and rescue service level can meet the service requirements for the target year.
	Fuel Supply	Sufficient Fuel Storage	The current supply quantity can meet the demand for the target year.
	Waste Water Treatment	Operation Outsourced	In accordance with the Kaohsiung City Government's related projects, wastewater will be discharged through the Kaohsiung City Government's sewer system.
	Waste Disposal	Collection and Removal Outsourced	Service Outsourced, No Capacity Need
South Air Traffic Service Park	NextGen ATC System Demand	ATC System Would Be Expanded Before Target Year	

Source: Organized by current master plan



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Current Issues of KIA

2

Future Development Strategy

## 07 Current Issues and Future Development Strategy of KIA | Current Issues of KIA

This master plan discusses three categories of development issues for KIA. The first category is derived from capacity predictions and involves a **review of hardware and software facilities as well as space requirements**. The second category stems from **stakeholder interviews**. The third category of issues is the **key topics mentioned in various related plans**.

After reviewing the three main categories of issues mentioned earlier, KIA faces five major development challenges, including **improvement of airside facilities** (taxiways and aprons), **increasing the passenger processing capacity for international routes**, **provision for the establishment of a next generation air traffic control system**, **increasing the supply of parking spaces** and **increasing the supply of business jet hangar facilities**.



Source: Drawn by current master plan

Figure 23 Current Issues of KIA

Based on the previously mentioned future development issues, this master plan involves devising short-term and mid-to-long term development strategies. In terms of short-term development strategy (from 2021 to 2025), it is expected that by 2025, there will be a problem of insufficient international terminal capacity during peak hours. Therefore, **preparations for the construction of a new terminal** should be completed in the short term, covering comprehensive planning and engineering contract processes, all of which should be completed within five years.

Regarding the mid-to-long-term development strategy (from 2026 to 2040), it is recommended that Kaohsiung Airport **completes the construction of the new terminal**, meeting the target passenger demand for the specified years. Apart from the hardware construction, consideration should be given to long-term development strategies to enhance the competitiveness of Kaohsiung Airport. It is also suggested that the various county and city governments in the southern region cooperate with Kaohsiung Airport to plan for the long-term growth in passenger volume, jointly devising complementary solutions.

#### Short Term Development Strategy

1. Enhancing runway operational efficiency by constructing high speed exit and bypass taxiways.
2. Continuing the progress of the new terminal building project, completing comprehensive planning and basic design.
3. Implementing smart technology to increase the capacity for international passengers.
4. Utilizing idle and flexible spaces to boost the capacity for international passengers.
5. Strengthening airport resilience to provide stable and secure services.

#### Mid-to-Long Term Development Strategy

1. Completion of the new terminal building project to fully meet the passenger demand in the target year.
2. Reviewing ways and means to increase non-aviation revenue sources to enhance the financial feasibility of the new terminal building construction.
3. Collaborating with relevant central and local tourism and economic development departments to formulate plans for doubling the number of tourism and business travelers, ensuring the efficiency of investments in airport infrastructure enhancement.
4. Encouraging airlines to open new routes and increase flight frequencies at Kaohsiung Airport.
5. Promoting green and environmentally friendly airport projects in line with the trend toward achieving net-zero carbon emissions.
6. Rolling out reviews of the long-term development space for passenger and cargo transportation to adapt to the current industrial investment surge.

Source: Organized by current master plan

Figure 24 Future Development Strategy of KIA

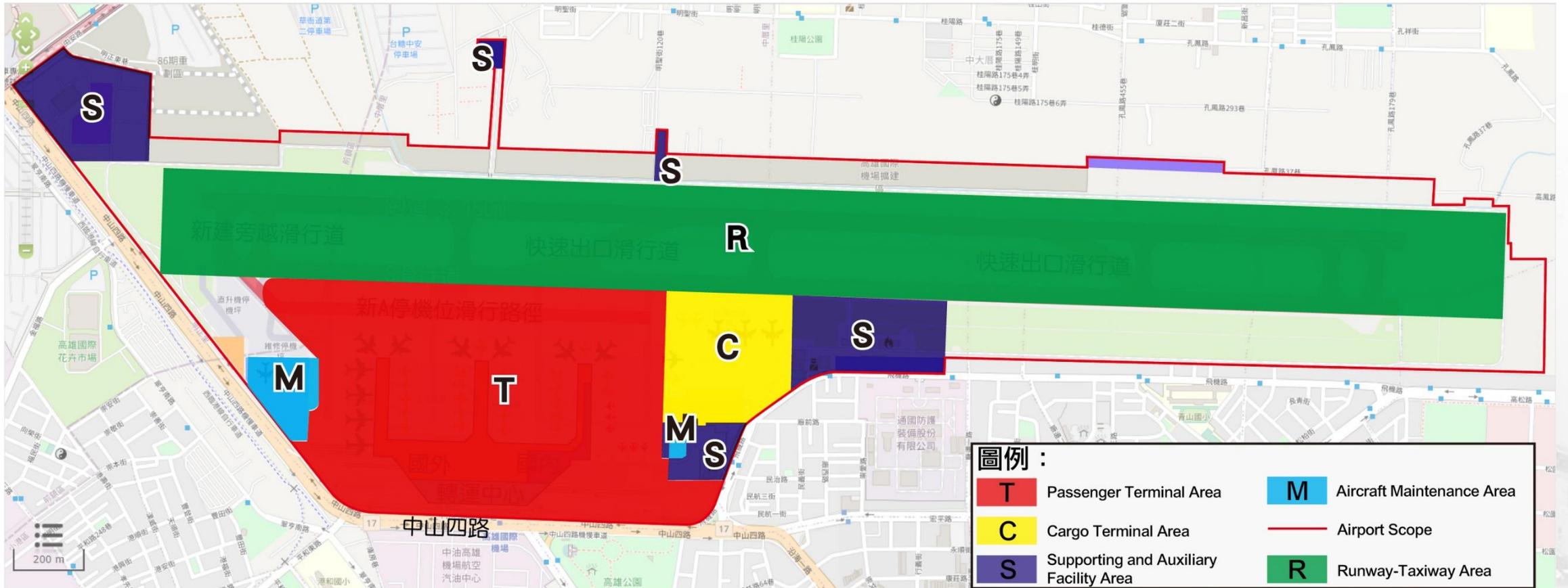


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- 1 Airport Land Use and Layout Planning
- 2 Major Construction Projects Suggestions
- 3 Overall Development Layout Plan at the Target Year

# 08 Airport Layout Planning | Airport Land Use and Layout Planning

Taking into account the hardware and software construction and update plans listed in the 2035 master plan, along with the development strategies recommended in the higher-level plans and the ongoing Kaohsiung Airport New Terminal Project, this master plan proposes a future functional area layout based on the existing space of Kaohsiung Airport. For the target year, it is recommended to **maintain the current layout with no significant changes.**



Source: Drawn by current master plan

Figure 25 KIA Functional Zoning Layout in the Target Year

## 08 Airport Layout Planning | Major Construction Projects Suggestions

After reviewing the spatial layout and confirming the software and hardware requirements in this master plan, recommendations for the improvement of key airport facilities in the target year are presented in Table 7.

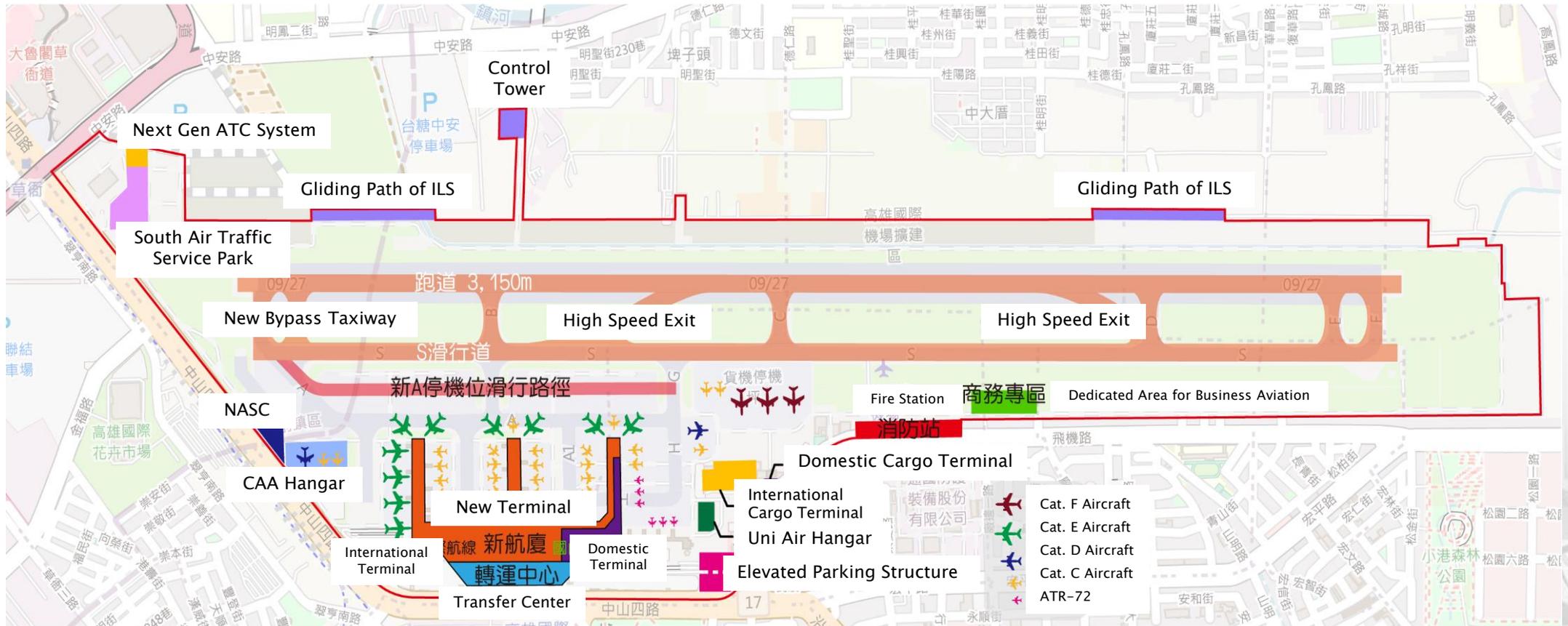
**Table 7 Airport Important Facilities Improvement Suggestions**

Important Facilities		To Be Improved	Suggestions of Major Constructions
Runway and Taxiway System	Taxiway	Improvement on Taxiway Geometry Layout and Aged Taxiway Surface	<ul style="list-style-type: none"> <li>① Gradually widen the turning area of the taxiway</li> <li>② In line with the construction plan for the new terminal, relocate the existing taxiway A to the north and repurposed as a taxi route of apron, thereby increasing the number of terminal parking stands.</li> <li>③ Add high speed exit to help reducing the time aircraft occupy the runway and save on aircraft taxiing time.</li> <li>④ Add bypass taxiway to enhance runway efficiency and increase flexibility in airport operation management.</li> <li>⑤ Carry out taxiway surface reconstruction will in conjunction with improvements to the lighting facilities to enhance airport safety.</li> </ul>
Apron	International	Insufficient Quantity	In line with the new terminal construction plan, also in response to the trends of future aircraft type changes, the apron layout will be adjusted, and markings will be redesigned with an incremental number of parking stands to 42.
	Domestic	Adjusted to Fit Aircraft Model and New Terminal Construction	
Passenger Terminal	International	Insufficient Capacity	According to the new terminal construction plan, the existing international and domestic terminals will be consolidated into a centralized terminal that serves both international and domestic flights, including transfer functions.
	Domestic	Aged Building	
Transportation Facility	Parking Space	Insufficient Quantity	As part of the new terminal construction plan, an underground terminal parking facility will be built, and an elevated parking structure will be also added on the east side.
Support Auxiliary Facility	Business Jet Hangar	Insufficient Quantity	A new hangar facility will be leased on the south side of the S taxiway, adjacent to the east of the fire station.
South Air Traffic Service Park		NextGen ATC System Demand	Approximately 0.2 hectares of land has been reserved in the immediate vicinity of the existing south air traffic service park area, which is currently outside the park.

Source: Organized by current master plan

# 08 Airport Layout Planning | Overall Development Layout Plan at the Target Year

Continuing from the previous master plan, higher-level plans, and the research results of the New Terminal Project, and incorporating the inventory and review conducted in this master plan, the spatial layout and planning concepts for various facilities are analyzed. In the end, the proposed layout for Kaohsiung Airport in the target year 2040 is presented as shown in Figure 26.



Source: Drawn by current master plan

Figure 26 KIA Layout in Target Year 2040



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Noise, Air Pollution, Waste Water and Solid Wastes

Based on the traffic forecasting results, facility requirements, land use and spatial planning, and taking into consideration future runway, taxiway and terminal construction projects, a preliminary analysis was conducted to assess noise, air quality, waste water treatment, and solid waste disposal during the construction and operational phases.

Due to the increase in air traffic volume and aircraft movements, the airport's primary emissions such as noise, exhaust emissions, greenhouse gases, wastewater, and solid waste are expected to increase. Upon review, the existing treatment capacity can still meet the pollution control requirements for the target year. Additionally, noise and air pollution will be partially controlled through the use of environmentally friendly aircraft models.

Table 8 Kaohsiung International Airport Environment Impact Assessment at the Target Year

<b>Aircraft Noise</b>	As aircraft movement increase, the noise control area in the target year will be slightly expanded.
<b>Air Quality</b>	As aircraft movements increase, the overall aviation fuel consumption continues to grow.
<b>Waste Water Treatment</b>	The increase in the number of passengers leads to higher water consumption and wastewater generation. In coordination with the progress of relevant projects by the Kaohsiung City Government, efforts will continue to promote the collection and discharge of wastewater to the sewage sewer.
<b>Solid Waste Disposal</b>	Solid waste generation also increases with the rise in the number of passengers. Currently, waste management is outsourced for garbage collection, and it is expected that the same operational method will continue to be used in the target year.
<b>Summary</b>	Due to the increase in air traffic volume and aircraft movements, the airport's primary emissions such as noise, exhaust emissions, greenhouse gases, wastewater, and solid waste are expected to increase. Upon review, the existing treatment capacity can still meet the pollution control requirements for the target year.

Source: Organized by current master plan



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## 10 Phasing Plan | Short-Term, Mid-to-Long-Term Projects

This master plan is aiming to outline the future development blueprint for the airport, providing the suggested short-term and mid-to-long-term projects to meet the development needs up to the target year 2040.

The plan includes a total of 8 projects, with 7 short-term projects implemented in 2021-2025 and 1 mid-to-long-term project implemented in 2026-2040. The schedules and budgets for the suggested construction projects will be further detailed in each specific project plan.

Table 9 The Phased Projects

Phases	No.	Projects
Short-Term Projects	1	International Terminal Air Bridge Replacement Project
	2	Air Bridge AC and Power Supply Installation in International Terminal
	3	Improvements to the Taxiway System
	4	Northside New Fence, Drainage, and Surrounding Facilities Construction Project
	5	Replacement of Aircraft Guiding System
	6	Phase I New Terminal Construction
	7	NextGen ATC System Construction by South ATS Park
Mid-to-Long-Term Projects	8	Phase II New Terminal Construction

Source: Organized by current master plan



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## 11 Conclusion | Conclusions and Suggestions

- The current master plan conducts an analysis of internal and external environmental factors for Kaohsiung Airport to understand the trends in the domestic and international aviation markets. The master Plan also outlines Kaohsiung Airport's development positioning as a "southern regional **international gateway airport**," a "southern regional **domestic hub airport**," a "**new southbound policy** development base," and a "**low-cost carrier** development hub." This positioning aligns with the 2035 master plan and 2040 system plan and does not undergo significant revisions.
- After reevaluating the internal and external environmental changes, such as the impact of COVID-19, the forecast results for the moderate scenario are consistent with the projections of related plans. The target year passenger volume is expected to grow to **14.27 million** passengers of which **12.22 million** are **international passengers** and **2.05 million** are **domestic passengers**.
- Based on these positioning and forecasting results, a review of the supply and demand for existing facilities was conducted (using the capacity of 2019 and evaluating the supply and demand for the target year 2040). It was identified that on the landside, **expansion is required for international terminal space** and various facilities (including traditional check-in counters, self-service check-in kiosks, passenger security screening, exit passport inspection, entry passport inspection, and baggage retrieval facilities), as well as **parking spaces** (for vehicles, taxis, and buses). On the airside, **taxiways and aprons** (international terminal parking positions) should also be reconfigured to accommodate the increases for takeoff and landing aircraft movements.

## 11 Conclusion | Conclusions and Suggestions

- After reviewing the planning concepts proposed in the 2035 master plan and assessing the progress and results of subsequent project implementations, it is expected that they will adequately meet the future passenger transport needs of Kaohsiung Airport. Therefore, the planning outcomes of this revised version have not undergone significant changes compared to the content of ongoing projects. The construction of the new terminal will be the most significant project for Kaohsiung Airport over the next 20 years.
- Subsequent study of the **master plan (target year 2045)** will be initiated in a timely manner. Ongoing monitoring of traffic growth at Kaohsiung Airport will continue, and various development and construction projects will be actively promoted according to the planning direction. This will enhance aviation safety, passenger service quality, and the international competitiveness of the Kaohsiung Airport, thereby driving overall development in the Kaohsiung and southern region of Taiwan.

