The 21st Century's Global Hub: Inchon International Airport

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Abstract

Inchon International Airport (IIA) is one of many new airports being constructed in the Asia Pacific region. IIA is located at the center of Northeast Asia connecting 43 major cities within 3.5 hour flight. With the

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sate-of-the-art airport facilities, IIA will also have the diverse functions of a modern airport for international business, where airport users can work and relax at the same time. It will be built for the multifunction of Pentaport - Airport, Businessport, Teleport, Seaport and Leisureport. IIA will be a leading hub airport for Northeast Asia in the coming 21st century.

This paper will focus on the development plan for Inchon International Airport and its current status.

1. Introduction

Korea has enjoyed rapid economic growth since the 1970's, and has now emerged as one of the largest trading countries in the world. This stunning economic development, Seoul Olympic Games and speeding up of globalization have all combined to drive the explosion in Korea'a viation demand, averaging over 12% annual growth in recent years. In 1995, the Kimpo Airport's international service recorded an astounding growth of 17% over the previous year, a rate unprecedented in the world's aviation history.

In response to this high aviation demand in Seoul metropolitan area, Inchon International Airport is now being built as a 24-hour operational sea airport. IIA is located at the center not only of the Korean peninsula but also of the Northeast Asia connecting within 3.5 hour flight 43 major cities having over 1 million populations. With this strategic location, IIA is well positioned to serve as the hub airport for the Northeast Asia region and a center for exchange of people, goods, and information. With the future development of the aviation industry, IIA will pioneer the era of the "one-day time zone", by connecting Europe, America and other opposite parts of the world in one central location.

Being built on Yongjong Island, IIA will be developed with facilities to accommodate the next-generation new large aircraft and supersonic aircraft.

The International Business Center equipped with a variety of state-of-the-art communication facilities, convention center, and top quality hotels will back up IIA as a next-generation airport providing "One-Stop Service".

IIA will be built for the multifunction of Pentaport-Airport, Businessport, Teleport, Seaport and Leisureport. This makes IIA far more than a transportation facility. IIA will be the Airport City of Northeast Asia, where global business and leisure travelers will come to work and relax at the same time.

2. Background for the development of IIA

Worldwide air passenger demand has grown at an annual rate of 7% for the past decade and will continue to grow at 6% annually for the next ten years. Moreover, during the same period, air transport in the Asia Pacific Region has increased by 10% each year, and is projected to increase annually by 9.5%.

Air transportation demand in Korea increased 12.9% per year during the past decade. From 1995 to 2000, the average annual growth rate in Korea's passenger demand is expected to be 8.7%.

With the growing trend in air traffic demand in Seoul metropolitan area, the handling capacity of Kimpo International Airport is expected to reach the saturation point by the late 1990s : aircraft movement and cargo traffic by 1998, and passenger traffic by 1997.

However, any further large scale expansion of Kimpo Airport is expected impossible since the airport vicinity is suffering from a serious noise problem and airspace limitations. As a result, the Korean Government studied this problem and finally decided to build a new, noise-free, around-the-clock airport in the Seoul metropolitan area.

3. Airport Location

The location is the most important factor to consider when constructing a new airport. Today, aircraft noise, meteorological conditions, obstacles for flight, and airport accessibility to major cities are taken into account.

Out of 22 potential candidates within a 100km radius of Seoul, Youngjong Island was selected in 1990, as final site for Inchon International Airport because of the ideal airport conditions.

Seoul metropolitan area has 20 million population and brings more than 90% of nation's aviation demand. The new airport is located 52 km away from Seoul and 15km away from Inchon City. It has 40 minutes travel time from downtown Seoul and is considered the ideal location for an air and sea transportation hub of the future.

Since the new airport is located on tidal land between 2 islands, it is free from noise problems and has vast land available for large airport development with low land reclamation cost due to shallow water depth.

This site has excellent meteorological conditions and only 39 days per year when there is less than 1,000m visibility. Also, fog at the new airport is usually not a problem.

4. Project Scope & Fundraising

The IIA construction project will be carried out in four phases from 1992 to 2020. The 1st phase will be completed by the year 2000.

Upon completion of Phase 1, the new airport will be capable of handling 27 million passengers, 1.7 million tons of cargo and 170 thousand flights annually.

By the year 2020, the airport will have a capacity to handle 100 million passengers, 7 million tons of cargo and 530 thousand flight annually.

Inchon International Airport is being developed in a totally different way from the existing airports in Korea. So far, the government has been solely responsible for airport construction costs.

This is not the case with IIA: over 60% of the total budget will be financed by Korea Airport Construction Authority (KOACA) and the private sector.

5. Airport Master Plan

The master plan of IIA construction project was announced officially by the Korean Government in 1992. To incorporate new ideas & technology, some revisions to the original master plan were made in 1995, after consultations from the government, International Aviation-Related bodies and airlines.

Let me now explain the layout of IIA facilities.

When fully developed by 2020, the new airport and its support community

will cover 5,615 ha of land.

IIA will have four 4,000m runways which can accommodate the future supersonic aircraft and new large airbus. Wide separation between runways enables simultaneous instrument take-off and landing. It will handle an average of one flight every 30 seconds. Extra space is secured on the east side of the airport for an additional runway to meet the increasing aviation demand in the future.

Two passenger terminals, four remote concourses and an apron capable of parking 155 aircrafts simultaneously will be built between the two pairs of independent parallel runways. Integrated Transportation Center between two passenger terminals will accommodate railways and parking lots.

The cargo terminals will be located to the east of the runways. The aircraft maintenance hangers will be placed north of the airport between runways. Refueling facilities, in-flight catering facilities, airport support and management facilities, transportation hub, and administration buildings will be constructed for maximum efficiency for overall airport operations.

To provide one-stop service to passengers, the International Business Center of 16.5 ha will be built south of the passenger terminals. The IBC will include exhibition halls, conference centers, business offices, shopping malls, hotels, and entertainment facilities. Second IBC comprising 130 ha will be located in the northwest corner of the airport near seaport.

The Support Community of 218 ha designed for residential, commercial and transportation functions will be located in the eastern part of the airport. Final built-out will comprise a total of 873 ha for the support complex.

IIA will also be equipped with sophisticated navigational aids (NAVAIDS)

facilities capable of operating at CAT-IIIa level in 200m visibility, as well as with a Communication Navigation Surveillance/Air Traffic Management (CNS/ATM) System. High technology NAVAIDS will ensure faster, safer services from four dimensional information by satellites, and eventually increase landings and take-offs.

The Airport Integrated Communication Center (AICC) will play the major role in airport communications. It will monitor, coordinate and control overall airport operations with the state-of-the-art technology, high standards of integrated communications, information systems and backbone communication networks.

6. Airport Regional Development

A new trend in airport construction is to go beyond building advanced airport facilities into developing airport surrounding area to support airport functions and to maximize the economic ripple effect.

In line with this trend, a total of 2,734 ha of IIA's surrounding area will be developed as a multifunctional new city accommodating such diverse functions as residential area, commercial area, business, airport-related hi-tech industries and recreational & leisure facilities.

IIA's surrounding area will be developed in phases and in a close coordination with the airport construction. When fully developed, this area is designed to accommodate 200,000 residents.

7. Access Transportation

IIA will have intermodal access transportation systems such as airport

expressway, airport railway, subway, underwater tunnel and seaport. With these access facilities in place, it will take 40 minutes from downtown Seoul to the airport.

The airport expressway is 40.2km long with 6~8 lane and serves as the major access route to the airport. This will connect the airport with the northern and southern Han Riverside road networks in Seoul. Also, it will be limited only to the airport traffic to minimize travel time to and from the airport. The construction work started from 1993 and will be completed by the year 2000, in time for airport opening.

Besides the airport expressway, a 53.7km double-track airport railway running at 110km per hour will connect the airport with downtown Seoul via Kimpo International Airport. The construction will start at the end of this year and be scheduled for completion by 2003, 3 years later the opening of the airport.

To connect these airport expressway and railroad systems with the airport from main land, a 4.4km double-deck suspension bridge is under construction. This bridge will have a 6 lane road on the upper level and 4 lane road with a double-track railway on the lower level. The distance between the 2 main bridge tower is 300m. The bridge clearance of 35m will allow 10,000 ton ships to pass beneath.

The bridge is designed to harmonize with the area's natural surrounding and become an area landmark.

Sea access transportation for IIA was planned in accordance with its geographical location, at the west of the Korean peninsula, surrounded by China and other countries. This sea transportation system will help IIA function as the air/sea/land transportation hub for the Northeast Asia region.

Sea traffic will include high speed ferry boats bringing passengers and cargo from the Yellow-Sea coastal area of China, Inchon City and other western areas of the peninsula. As an alternate to the land transportation, this sea transportation will decrease the land traffic and reduce infrastructure cost.

The seaport of IIA will have two berths for 70,000 DWT oil tank vessels, two berths for 5,000 DWT freight vessels, and one berth for 3,000 GT passenger ferries.

In the long-term, a lot of other transportation modes are being planned. Second airport expressway will connect Kyung-in Expressway 2 with airport. This will be further linked with the Seoul-Pusan High-Speed Railway. To this, third expressway linked with Kyung-in Expressway 1 will be added. The construction of underwater-tunnel linked to Kyung-in Expressway 3 is now being considered by private sector. To complement overland cargo transportation, Seaport will be connected with Kyung-in Canal which is planned to be completed by the year 2000.

8. Airport Transportation System

The airport expressway with 8 lanes will expand to 12~16 lanes from support community to passenger terminal. To reduce traffic congestion at the terminal curbside, each level is designed exclusively for departures or arrivals.

Northern arterial road expanded from the airport expressway serves cargo terminal area and aircraft maintenance area. This is also branched off to city road to Yongyu Island.

Southern and northern arterial roads are linked with arterial road

running south-north for cargo terminals and support facilities area east of airport.

Parking facilities will be designed for long-term and short-term parking. At IIA, two short-term parking facilities will be located south of the terminal, capacity of total 11,000 cars. In the final phase, transportation hub will be built east of the terminal and accommodate an additional 14,500 cars.

Passenger will access the 2 terminals and remote concourses by using IAT (Intra Airport Transit) system. This IAT system will run every 108 seconds and take 7 minutes to reach the farthest concourse. The capacity will be 14,000 passengers per hour.

The PMS(People Mover System) will link passenger terminals 1 and 2 with the International Business Center with a capacity of 10,000 passengers per hour.

The integrated Transportation center, located between passenger terminals 1 and 2, will be the primary intermodal facility for transportation systems, where railways coming from Seoul and Inchon Cities, IAT, PMS and BHS are connected each other.

9. Construction Status

The ground-breaking for the Inchon International Airport construction was in November 1992. The 1st phase construction will be completed by 1999 and initial operation will commence in the year 2000.

Overall project progress is 29.2% as of May 1997. And the target project progress is 45% by the end of this year.

The main construction works of the phase 1 include the 1,174 ha of site preparation, two runways, 357,000m^2 of passenger terminal, 175,000m^2 of cargo terminal, 270,000m^2 of transportation center and 50 support buildings.

In order to reclaim 4,743 ha of the tidal land between two islands, the 6.1km southern dike and the 7.3km northern dike were completed. Site preparation such as reclamation and soft soil improvement for the 1,389 ha of land is underway. As of May 1997, the site preparation is 94% completed.

The runway and taxi-way construction work just started at the beginning of this year and is scheduled for completion by December 1999.

For passenger terminal, it will take 5 years in design and 4 years in construction. In order to save design and construction time, the terminal is being built in Fast Track Method. The excavation work started at the January 1996, the piling work at the May 1996, and the structural work at the December 1996. The exterior wall work and finishing work will start this year.

Since the start of construction, a total of 1.3 million dump truck loads of soil have been excavated for terminal foundation and 13,000 piles are being driven. The structural work just started. The Baggage Handling System is under design.

To carry out full-scale construction from this year, KOACA plans to arrange an international public bidding process for more than 100 construction packages in 1997.

10. Green Airport

To develop an environmentally friendly airport, IIA is planned to build

"Green Airport", which means environment-awareness airport through strict environmental management, to maintain and preserve nature.

The KOACA is fully committed to working out problems such as noise, waste water disposal and other environmental concerns, while assuring closer cooperation with the community and quality construction agreeable to ISO environmental standards.

Green area at IIA will have more than 30% of land. The landscaping along the seaside dikes will make the IIA the most beautiful airport in the world.